

The Siemens logo is displayed in a white rectangular box. The background of the entire page is a futuristic industrial scene with glowing blue and green lines, wireframe models of machinery, and data visualizations.

SIMATIC

# Products for Totally Integrated Automation

Catalog  
ST 70

Edition  
2021

[siemens.com/tia](https://www.siemens.com/tia)

## Related catalogs

### **SIMATIC HMI / PC-based Automation**

ST 80/ST PC

Human Machine Interface Systems  
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PDF (E86060-K4680-A101-C8-7600)



### **SITRAIN**

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SIMATIC PCS 7 Process Control System  
Vol. 1: System components

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### **Siemens TIA Selection Tool**

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E86060-D4001-A510-D9



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# TIA Selection Tool

The smart configurator for the entire Siemens automation portfolio



## Prime reasons for the TIA Selection Tool



### Quick, easy and secure

Components can be selected, configured and ordered quickly, easily and securely from the Siemens automation portfolio



### Intelligent

Intelligent selection wizards check the compatibility of the configured components and enable error-free ordering



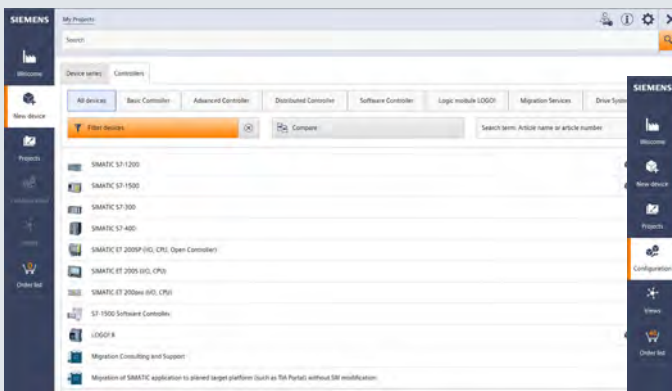
### Clear

Required modules, devices and networks are automatically generated and clearly compared to one another



### Time-saving

Time savings of 80% in design – thanks to ease of use and intelligent support



The TIA Selection Tool is a completely paperless solution.

Download it now:

[www.siemens.com/tst](http://www.siemens.com/tst)

For more information, scan the QR code





# Products for Totally Integrated Automation

## SIMATIC



### Catalog ST 70 · 2021

Supersedes:  
Catalog ST 70 · 2019  
Catalog News ST 70 N · 2020

Refer to the Industry Mall for current updates of  
this catalog:

[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

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The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with DIN EN ISO 9001 (Certified Registration No. 001323QM-15). The certificate is recognized by all IQNet countries.

# Digital Enterprise

## The building blocks that ensure everything works together perfectly in the digital enterprise

Digitalization is already changing all areas of life and existing business models. It is placing greater pressure on industry while at the same time creating new business opportunities. Today, thanks to scalable solutions from Siemens, companies can already become a digital enterprise and ensure their competitiveness.



### Industry faces tremendous challenges



#### Reduce time-to-market

Today manufacturers have to bring products to market at an ever-increasing pace despite the growing complexity of these products. In the past, a major manufacturer would push aside a small one, but now it is a fast manufacturer that overtakes a slow one.



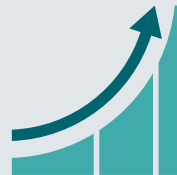
#### Boost flexibility

Consumers want customized products, but at a price they would pay for a mass-produced item. That only works if production is more flexible than ever before.



#### Improve quality

To ensure a high level of quality while meeting legal requirements, companies have to establish closed quality loops and enable the traceability of products.



#### Boost efficiency

Today the product itself needs to be sustainable and environmentally friendly, while energy efficiency in production has become a competitive advantage.



#### Increase security

Increasing networking escalates the threat to production facilities of cyberattacks. Today more than ever, companies need suitable security measures.



### The digital enterprise has already become a reality

To fully benefit from all the advantages of digitalization, companies first have to achieve complete consistency of their data. Fully digitally integrated business processes, including those of suppliers, can help to create a digital representation of the entire value chain. This requires

- the integration of industrial software and automation,
- expansion of the communication networks,
- security in automation,
- and the use of business-specific industrial services.

### MindSphere

#### The cloud-based open IoT operating system from Siemens

With MindSphere, Siemens offers a cost-effective and scalable cloud platform as a service (PaaS) for the development of applications. The platform, designed as an open operating system for the Internet of Things, makes it possible to improve the efficiency of plants by collecting and analyzing large volumes of production data.

### Totally Integrated Automation (TIA) Where digitalization becomes reality

Totally Integrated Automation (TIA) ensures the seamless transition from the virtual to the real world. It already encompasses all the necessary conditions for transforming the benefits of digitalization into true added value. The data that will form the digital twin for actual production is generated from a common base.

#### Digital Plant

Learn more about the digital enterprise for the process industry  
[www.siemens.com/digitalplant](http://www.siemens.com/digitalplant)

#### Digital Enterprise Suite

Learn more about the digital enterprise for the discrete industry  
[www.siemens.com/digital-enterprise-suite](http://www.siemens.com/digital-enterprise-suite)





## Introduction



1/2

**Totally Integrated Automation –  
Integration<sup>3</sup>**

Totally Integrated Automation – Integration<sup>3</sup>

# Working together to advance automation

Sustainably advancing the world of industry: That's long been the driving force behind new developments at Siemens – even 25 years ago, when Totally Integrated Automation (TIA) was introduced. At that time, TIA represented a totally new method of automation that had a lasting impact on automation technology overall. A fundamental element of TIA is consistency based on integrated automation. That's why every element in the portfolio has identical core characteristics to ensure that they will work together perfectly.

## Data transparency through OT/IT integration

Of course, the industry and the associated demands on automation have undergone major changes. We are now in the throes of the fourth industrial revolution, and factories are generating huge volumes of data. This data is the key to optimization and competitiveness, but at the same time the amount of data and the variety of data sources are rapidly growing. That's why it is a major challenge to get the most out of the data to meet increasingly refined customer demands, right down to flexible production of single-unit batches.

Data transparency and data quality both have to be good in order to meet these requirements, which is why the integrated approach has been further refined. TIA still represents maximum consistency, harmonizing all components and competencies and ensuring communication between all of these elements. Rather than being confined to the field, this now takes place at all levels through to corporate management level, with a broad scope in place for innovations that are already being thought into today and integrated step-by-step. The result is known as "Integration<sup>3</sup>."

This advance is being achieved through consistent data management, global standards, standardized interfaces, and openness from OT (Operational Technology) to IT (Information Technology). At the production level, in the OT area in other words, sensors and actuators generate a lot of data to enable automation tasks to be performed. And the IT area involves a vast amount of information, by definition. The added value and the basis for new business models lie in combining these two environments so that information from both areas can be used simultaneously. Thanks to an end-to-end range of TIA products – from Simatic controllers to Sinamics frequency converters and Simotics motors and the associated fieldbuses – Siemens offers an infrastructure built up over many years that can gather all information originating in OT. This means that the data are already available in most systems. To communicate with the IT area, Siemens relies on the open standard OPC UA, which not only offers connectivity but also defines standards for data structure with its OPC UA companion specifications. These specifications are easy to implement in TIA Portal using drag-and-drop.

## Flexible and secure from field to cloud

If the basis for communication is provided and the data are available in the right structure, there are multiple opportunities for integration. The machines can be connected to the MES system, or the production data can be transmitted directly to the cloud. The next milestone in OT/IT integration is edge computing. This involves shifting IT technologies to the manufacturing area, where Edge devices have so much computing power that they can run specific applications and orchestrate communication with other parts of the factory. Industrial Edge allows you to evaluate



and analyze all data at the machine, or to preprocess it quickly and instantly. The optimized data points can then be transmitted to the cloud more quickly. That creates new opportunities for users, including centrally installing updates or AI applications for predictive maintenance. Specific services also support users throughout the lifecycle of their machines to reveal hidden potential.

### Solutions for the future

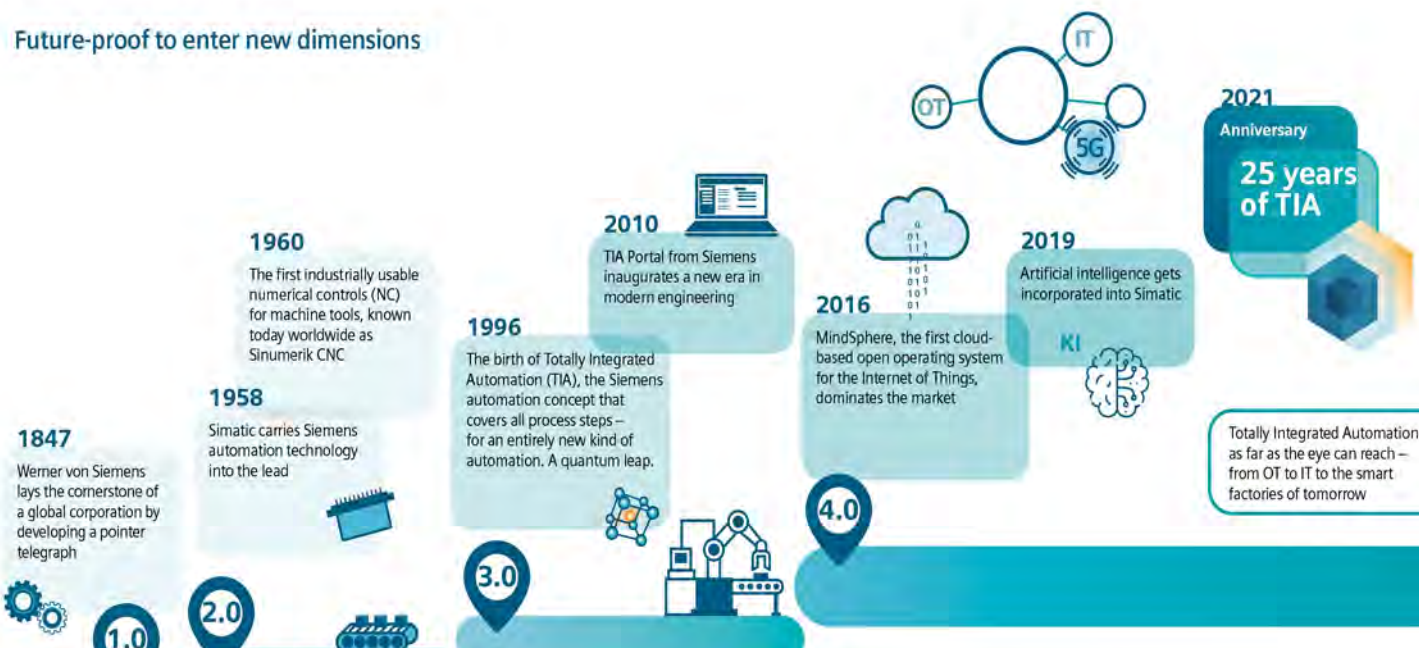
The Totally Integrated Automation approach is Siemens' way of not only responding to change but actively shaping it. Innovations such as artificial intelligence (AI) are already being gradually integrated, and more solutions for the future are being developed. But to use AI applications safely and beneficially in industry, it is essential for machine learning to work in tandem with software, hardware, the appropriate IT infrastructure, and domain and automation expertise. Entirely new opportunities for optimization will come with anomaly recognition or preventive maintenance, from autonomous handling of unfamiliar objects to improved availability and quality assurance. ■

› [siemens.com/tia](https://www.siemens.com/tia)

### Highlights

- **Maximum data transparency** thanks to consistency, global standards, and uniform interfaces at all levels
- **New business models thanks to OT/IT integration** with OPC UA, cloud connectivity, and edge connections
- Future-proofing thanks to the **integration of innovations** such as artificial intelligence

### Future-proof to enter new dimensions





## LOGO! logic modules



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# LOGO! logic modules

## Introduction

### LOGO! logic modules

#### Overview



#### LOGO! logic modules

- The compact, easy-to-use and low-cost solution for simple control tasks
- Compact, easy to operate, universally applicable without accessories
- "All in one": Integrated display and operator panel
- 36 different functions can be connected at the press of a button or by means of PC software; up to 130 times
- LOGO! 8: 38/43 different functions can be linked at the press of a button or using PC software; up to 200/400 times
- Functions are easy to change at the press of a button. No more time-consuming rewiring

#### SIPLUS LOGO!

- The controller for use in the toughest environmental conditions
- With extended temperature range from -40/-25 °C to +70 °C
- Suitable for exposure to media (harmful gas atmosphere)
- Condensation permissible
- With the proven PLC technology of LOGO!
- Easy to handle, program, maintain, and service
- Ideal for use in automotive engineering, environmental engineering, mining, chemical plants, material handling, food industry, etc.

#### Accessories:

- The front panel mounting set also allows simple and reliable installation of the logic modules in front panels; IP65 protection is thus possible.
- In order to ensure dependable operation of SIPLUS devices supplied by the battery in conjunction with combustion engines, it is necessary to put in a SIPLUS upmiter upstream device between the battery and the SIPLUS LOGO!.

For more information, please go to:

<http://www.siemens.com/siplus-extreme>

#### General technical specifications SIPLUS LOGO!

Ambient temperature range	-40/-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

#### Ambient conditions

Extended range of environmental conditions	
<ul style="list-style-type: none"> <li>• with reference to ambient temperature, air pressure and altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<ul style="list-style-type: none"> <li>• At cold restart, min.</li> </ul>	0° C
Relative humidity	
<ul style="list-style-type: none"> <li>• with condensation, max.</li> </ul>	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
<ul style="list-style-type: none"> <li>• to biologically active substances/ compliance with EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
<ul style="list-style-type: none"> <li>• to chemically active substances/ compliance with EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
<ul style="list-style-type: none"> <li>• to mechanically active substances, compliance with EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

### Overview



- The space-saving basic variants
- Interface for the connection of expansion modules, up to 24 digital inputs, 20 digital outputs, 8 analog inputs and 8 analog outputs can be addressed
- All basic units with integrated web server
- Enclosure width 72 mm (4 MW)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro CF cards

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### Ordering data

#### LOGO! 8 logic module

##### LOGO! 24CE

Supply voltage 24 V DC, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability

### Article No.

6ED1052-1CC08-0BA1

##### LOGO! 12/24RCE

Supply voltage 12...24 V DC, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V) 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability

6ED1052-1MD08-0BA1

##### LOGO! 24RCE

Supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability

6ED1052-1HB08-0BA1

##### LOGO! 230RCE

Supply voltage 115...230 V AC/DC, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability

6ED1052-1FB08-0BA1

#### Accessories

##### LOGO! 8 Text Display HMI

6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply

### Article No.

6ED1055-4MH08-0BA1

##### LOGO!Soft Comfort V8

For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD

6ED1058-0BA08-0YA1

##### LOGO! Starter Kits

In TANOS Box, with LOGO! Soft Comfort V8, WinCC Basic, Ethernet cable

##### LOGO! Starter Kit 12/24 RCE

With LOGO! 12/24 RCE, power supply, screwdriver, in Systainer

6ED1057-3BA01-0AA8

##### LOGO! Starter Kit 130 RCE

With LOGO! 230 RCE, power supply, screwdriver, in Systainer

6ED1057-3BA03-0AA8

##### LOGO! Starter Kit 12/24 V

With LOGO! 12/24 RCEO, LOGO! TD, power supply, screwdriver, in Systainer

6ED1057-3BA11-0AA8

##### LOGO! 8 KP300 Basic Starter Kit

With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN

6AV2132-0HA00-0AA1

##### LOGO! 8 KTP400 Basic Starter Kit

With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic

6AV2132-0KA00-0AA1

##### LOGO! 8 KTP700 Basic Starter Kit

With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic

6AV2132-3GB00-0AA1

##### Front panel mounting set

Width 4 MW, with keys

6AG1057-1AA00-0AA3

Width 8 MW, with keys

6AG1057-1AA00-0AA2

## LOGO! logic modules

### LOGO! basic and expansion modules

#### LOGO! basic modules with display

#### Technical specifications

Article number	6ED1052-1CC08-0BA1 LOGO! 24CE, 8DI(4AI)/4DO, 400 Blocks	6ED1052-1MD08-0BA1 LOGO!12/24RCE, 8DI(4AI)/4DO, 400 Blocks	6ED1052-1HB08-0BA1 LOGO! 24RCE, 8DI/4DO, 400 Blocks	6ED1052-1FB08-0BA1 LOGO!230RCE, 8DI/4DO, 400 Blocks
<b>Display</b>				
with display	Yes	Yes	Yes	Yes
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes; 240 V DC
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes; 240 V AC
<b>Time of day</b>				
<b>Time switching clocks</b>				
• Number	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific
• Power reserve	480 h	480 h	480 h	480 h
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
<b>Output current</b>				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in acc. with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C	55 °C
<b>Altitude during operation relating to sea level</b>				
• Ambient air temperature- barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Dimensions</b>				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	60 mm	60 mm	60 mm	60 mm



## LOGO! logic modules

### LOGO! basic and expansion modules

#### LOGO! basic modules without display

#### Overview



- Basic variants optimized for costs
- Interface for the connection of expansion modules, up to 24 digital inputs, 20 digital outputs, 8 analog inputs and 8 analog outputs can be addressed
- With connection option for LOGO! TDE text display
- All basic units with integrated web server
- Enclosure width 72 mm (4 MW)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro CF cards

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#### Ordering data

Ordering data	Article No.
<b>LOGO! 8 logic module</b>	
<b>LOGO! 24CEo logic module</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integral time switch Ethernet interface; without display and keyboard; 400 function blocks can be interlinked, modular expansion capability	<b>6ED1052-2CC08-0BA1</b>
<b>LOGO! 12/24RCEo logic module</b> 12...24 V DC supply voltage, 8 digital inputs 12...24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integrated time switch, Ethernet interface; without display and keyboard; 400 function blocks can be interlinked, modular expansion capability	<b>6ED1052-2MD08-0BA1</b>
<b>LOGO! 24RCEo logic module</b> 24 V AC/DC supply voltage, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability	<b>6ED1052-2HB08-0BA1</b>
<b>LOGO! 230RCEo logic module</b> 115...230 V AC/DC supply voltage, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integral time switch; Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability	<b>6ED1052-2FB08-0BA1</b>

#### Article No.

Accessories	Article No.
<b>LOGO! TDE Text Display</b> 6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply	<b>6ED1055-4MH08-0BA1</b>
<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	<b>6ED1058-0BA08-0YA1</b>
<b>LOGO! Starter Kits</b> In TANOS Box, with LOGO! Soft Comfort V8, WinCC Basic, Ethernet cable	
<b>LOGO! Starter Kit 12/24 RCE</b> With LOGO! 12/24 RCE, power supply, screwdriver, in Systainer	<b>6ED1057-3BA01-0AA8</b>
<b>LOGO! Starter Kit 130 RCE</b> With LOGO! 230 RCE, power supply, screwdriver, in Systainer	<b>6ED1057-3BA03-0AA8</b>
<b>LOGO! Starter Kit 12/24 V</b> With LOGO! 12/24 RCEo, LOGO! TD, power supply, screwdriver, in Systainer	<b>6ED1057-3BA11-0AA8</b>
<b>LOGO! 8 KP300 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN	<b>6AV2132-0HA00-0AA1</b>
<b>LOGO! 8 KTP400 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic	<b>6AV2132-0KA00-0AA1</b>
<b>LOGO! 8 KTP700 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic	<b>6AV2132-3GB00-0AA1</b>

## LOGO! logic modules

### LOGO! basic and expansion modules

#### LOGO! basic modules without display

#### Technical specifications

Article number	6ED1052-2CC08-0BA1	6ED1052-2MD08-0BA1	6ED1052-2HB08-0BA1	6ED1052-2FB08-0BA1
	LOGO! 24CEo, 8DI(4AI)/4DO, 400 Blocks	LOGO!12/24RCEO, 8DI(4AI)/4DO, 400 Blocks	LOGO! 24RCEO, 8DI/4DO, 400 Blocks	LOGO!230RCEo, 8DI/4DO, 400 Blocks
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)		Yes		
<ul style="list-style-type: none"> <li>• 12 V DC</li> <li>• 24 V DC</li> <li>• 115 V DC</li> <li>• 230 V DC</li> </ul>	Yes	Yes	Yes	Yes
Rated value (AC)			Yes	
<ul style="list-style-type: none"> <li>• 115 V AC</li> <li>• 230 V AC</li> </ul>			Yes	Yes
<b>Time of day</b>				
<b>Time switching clocks</b>				
<ul style="list-style-type: none"> <li>• Number</li> <li>• Power reserve</li> </ul>	400; Max. 400, function-specific 480 h	400; Max. 400, function-specific 480 h	400; Max. 400, function-specific	400; Max. 400, function-specific 480 h
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
<b>Output current</b>				
<ul style="list-style-type: none"> <li>• for signal "1" permissible range for 0 to 55 °C, max.</li> </ul>	0.3 A	10 A		
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
<ul style="list-style-type: none"> <li>• Limit class B, for use in residential areas</li> </ul>	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
<ul style="list-style-type: none"> <li>• min.</li> <li>• max.</li> </ul>	-20 °C; No condensation 55 °C	-20 °C; No condensation 55 °C	-20 °C; No condensation 55 °C	-20 °C; No condensation 55 °C
<b>Altitude during operation relating to sea level</b>				
<ul style="list-style-type: none"> <li>• Ambient air temperature- barometric pressure-altitude</li> </ul>	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Dimensions</b>				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	60 mm	60 mm	60 mm	60 mm

**Overview**


- Expansion modules for connection to LOGO! Modular
- With digital inputs and outputs, analog inputs, or analog outputs

2

**Ordering data**

Ordering data	Article No.	Ordering data	Article No.
<b>LOGO! 8 expansion modules</b>		<b>LOGO! AM2</b>	<b>6ED1055-1MA00-0BA2</b>
<b>LOGO! DM8 24</b> 24 V DC supply voltage, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A	<b>6ED1055-1CB00-0BA2</b>	12...24 V DC supply voltage, 2 analog inputs 0 to 10 V or 0 to 20 mA, resolution 10 bits	
<b>LOGO! DM16 24</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 digital outputs 24 V DC, 0.3 A	<b>6ED1055-1CB10-0BA2</b>	<b>LOGO! AM2 PT 100</b>	<b>6ED1055-1MD00-0BA2</b>
<b>LOGO! DM8 12/24R</b> 12...24 V DC supply voltage, 4 digital inputs 12...24 V DC, 4 relay outputs 5 A	<b>6ED1055-1MB00-0BA2</b>	12...24 V DC supply voltage, 2 analog inputs Pt100, temperature range -50 °C to 200 °C	
<b>LOGO! DM8 24R</b> 24 V AC/DC supply voltage, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A	<b>6ED1055-1HB00-0BA2</b>	<b>LOGO! AM2 AQ</b>	<b>6ED1055-1MM00-0BA2</b>
<b>LOGO! DM16 24R</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 relay outputs 5 A	<b>6ED1055-1NB10-0BA2</b>	24 V DC supply voltage, 2 analog outputs 0 to 10 V, 0/4 to 20 mA	
<b>LOGO! DM8 230R</b> 115...230 V AC/DC supply voltage, 4 digital inputs 115...230 V AC/DC, 4 relay outputs 5 A	<b>6ED1055-1FB00-0BA2</b>	<b>Accessories for LOGO! 8</b>	
<b>LOGO! DM16 230R</b> 115...230 V AC/DC supply voltage, 8 digital inputs 115...230 V AC/DC, 8 relay outputs 5 A	<b>6ED1055-1FB10-0BA2</b>	<b>LOGO!Soft Comfort V8</b>	<b>6ED1058-0BA08-0YA1</b>
		For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	

## LOGO! logic modules

### LOGO! basic and expansion modules

#### LOGO! expansion modules

#### Technical specifications

Article number	6ED1055-1CB00-0BA2 LOGO! DM8 24 Exp. mod., 4DI/4DO	6ED1055-1HB00-0BA2 LOGO! DM8 24R Exp. mod. 2 MW, 4DI/4DO	6ED1055-1MB00-0BA2 LOGO! DM8 12/24R Exp. mod. 2 MW, 4DI/DO	6ED1055-1FB00-0BA2 LOGO! DM8 230R Exp. mod. 2 MW, 4DI/4DO
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)			Yes	
• 12 V DC	Yes	Yes	Yes	
• 24 V DC				Yes
• 115 V DC				Yes
• 230 V DC				
Rated value (AC)				
• 24 V AC		Yes		Yes
• 115 V AC				Yes
• 230 V AC				Yes
<b>Line frequency</b>				
• permissible range, lower limit		47 Hz		47 Hz
• permissible range, upper limit		63 Hz		63 Hz
<b>Digital inputs</b>				
Number of digital inputs	4	4	4	4
<b>Input voltage</b>				
• Type of input voltage	DC	AC/DC	DC	AC/DC
• for signal "0"	< 5 V DC	< 5 V AC/DC	< 5 V DC	< 40 V AC, < 30 V DC
• for signal "1"	> 12 V DC	> 12 V AC/DC	> 8.5 V	> 79 V AC, > 79 V DC
<b>Input current</b>				
• for signal "0", max. (permissible quiescent current)	0.88 mA	1.1 mA	0.88 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	2.1 mA	2.63 mA	1.5 mA	0.13 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>				
- at "0" to "1", max.	1.5 ms	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	15 ms	1.5 ms	75 ms
<b>Digital outputs</b>				
Number of digital outputs	4	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes	No	No	No
Controlling a digital input		Yes	Yes	Yes
<b>Switching capacity of the outputs</b>				
• on lamp load, max.		1 000 W	1 000 W	1 000 W; 500 W at 115V AC
<b>Parallel switching of two outputs</b>				
• for uprating	No	No	No	No
<b>Switching frequency</b>				
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		5 A	5 A	5 A
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes	Yes	Yes	Yes

**Technical specifications**

Article number	<b>6ED1055-1CB00-0BA2</b> LOGO! DM8 24 Exp. mod., 4DI/4DO	<b>6ED1055-1HB00-0BA2</b> LOGO! DM8 24R Exp. mod. 2 MW, 4DI/4DO	<b>6ED1055-1MB00-0BA2</b> LOGO! DM8 12/24R Exp. mod. 2 MW, 4DI/DO	<b>6ED1055-1FB00-0BA2</b> LOGO! DM8 230R Exp. mod. 2 MW, 4DI/4DO
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes		Yes
Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Dimensions</b>				
Width	35.5 mm	35.5 mm	35.5 mm	35.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm
Article number	<b>6ED1055-1CB10-0BA2</b> LOGO! DM16 24 Exp. mod., 4 MW, 8DI/8DO	<b>6ED1055-1NB10-0BA2</b> LOGO! DM16 24R Exp. mod. 4 MW, 8DI/8DO	<b>6ED1055-1FB10-0BA2</b> LOGO! DM16 230R Exp. mod. 4 MW, 8DI/8DO	
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	
<b>Supply voltage</b>				
Rated value (DC)	Yes	Yes	Yes Yes	
• 24 V DC				
• 115 V DC • 230 V DC				
Rated value (AC)	No	No	Yes Yes	
• 24 V AC				
• 115 V AC • 230 V AC				
<b>Line frequency</b>				
• permissible range, lower limit			47 Hz	
• permissible range, upper limit			63 Hz	
<b>Digital inputs</b>				
Number of digital inputs	8	8	8	
<b>Input voltage</b>				
• Type of input voltage	DC	DC	AC/DC	
• for signal "0"	< 5 V DC	< 5 V DC	< 40 V AC, < 30 V DC	
• for signal "1"	> 12 V DC	> 12 V DC	> 79 V AC, > 79 V DC	
<b>Input current</b>				
• for signal "0", max. (permissible quiescent current)	0.85 mA	0.85 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC	
• for signal "1", typ.	2 mA	2 mA	0.13 mA	
<b>Input delay (for rated value of input voltage)</b>				
<b>for standard inputs</b>				
- at "0" to "1", max.	1.5 ms	1.5 ms	40 ms	
- at "1" to "0", max.	1.5 ms	1.5 ms	75 ms	

**LOGO! logic modules**

## LOGO! basic and expansion modules

## LOGO! expansion modules

**Technical specifications**

Article number	<b>6ED1055-1CB10-0BA2</b> LOGO! DM16 24 Exp. mod., 4 MW, 8DI/8DO	<b>6ED1055-1NB10-0BA2</b> LOGO! DM16 24R Exp. mod. 4 MW, 8DI/8DO	<b>6ED1055-1FB10-0BA2</b> LOGO! DM16 230R Exp. mod. 4 MW, 8DI/8DO
<b>Digital outputs</b>			
Number of digital outputs	8	8; Relays	8; Relays
Short-circuit protection	Yes	No	No
Controlling a digital input		Yes	Yes
<b>Switching capacity of the outputs</b>			
• on lamp load, max.		1 000 W	1 000 W; 500 W at 115V AC
<b>Parallel switching of two outputs</b>			
• for uprating	No	No	No
<b>Switching frequency</b>			
• with resistive load, max.	10 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz
<b>Relay outputs</b>			
<b>Switching capacity of contacts</b>			
- with inductive load, max.		3 A	3 A
- with resistive load, max.		5 A	5 A
<b>EMC</b>			
<b>Emission of radio interference acc. to EN 55 011</b>			
• Limit class B, for use in residential areas	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C
• max.	55 °C	55 °C	55 °C
<b>Dimensions</b>			
Width	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm

**Technical specifications**

Article number	<b>6ED1055-1MA00-0BA2</b> LOGO! AM2 Exp. mod., 12/24V, 2AI,	<b>6ED1055-1MD00-0BA2</b> LOGO! AM2 RTD, 2AI, -50..+200DECR/C
<b>Installation type/mounting</b>		
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>		
Rated value (DC)		
• 12 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
• 24 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
<b>Analog inputs</b>		
Number of analog inputs	2	2; 2 or 3 wire connection
<b>Input ranges</b>		
• Voltage	Yes	No
• Current	Yes	No
• Resistance thermometer	No	Yes; For PT100/PT1000 sensors
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	No
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA	No
<b>Input ranges (rated values), resistance thermometer</b>		
• Pt 100	No	Yes
<b>EMC</b>		
<b>Emission of radio interference acc. to EN 55 011</b>		
• Limit class B, for use in residential areas	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
FM approval	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes
according to VDE 0631	Yes	
Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C
• max.	55 °C	55 °C
<b>Dimensions</b>		
Width	35.5 mm	35.5 mm
Height	90 mm	90 mm
Depth	58 mm	58 mm

**LOGO! logic modules**

## LOGO! basic and expansion modules

**LOGO! expansion modules****Technical specifications**

Article number	<b>6ED1055-1MM00-0BA2</b> LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20mA
<b>Installation type/mounting</b>	
Mounting	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Analog outputs</b>	
Number of analog outputs	2
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>EMC</b>	
<b>Emission of radio interference acc. to EN 55 011</b>	
• Limit class B, for use in residential areas	Yes

Article number	<b>6ED1055-1MM00-0BA2</b> LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20mA
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
FM approval	Yes
developed in accordance with IEC 61131	Yes
according to VDE 0631	Yes
Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C; ES03 and higher: -20 °C
• max.	55 °C
<b>Dimensions</b>	
Width	35.5 mm
Height	90 mm
Depth	58 mm



#### Overview



- The space-saving basic variants
- Interface for connecting expansion modules, up to 24 digital inputs, 20 (16) digital outputs, 8 analog inputs and 8 (2) analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 and 0BA7 basic variants); LOGO! TDE can be connected to LOGO! 8 or higher

New for LOGO! 8

- All basic units with integrated web server
- Same enclosure width as LOGO! 0BA6 (4 MW)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controllers, SIMATIC Panel and PC
- Use of standard micro CF cards

LOGO! 0BA7 versions:

- Ethernet interface for communication with SIMATIC Controllers, SIMATIC Panel and PC
- Networking of max. 8 LOGO! devices
- Use of standard SD card or SIMATIC Memory Card

Note:

SIPLUS LOGO! 6/7 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### SIPLUS LOGO! 8 logic module

##### SIPLUS LOGO! 24CE

24 V DC supply voltage,  
8 digital inputs 24 V DC,  
of which 4 can be used  
in analog mode (0 to 10 V),  
4 digital outputs 24 V DC, 0.3 A,  
integrated time switch  
Ethernet interface;  
400 function blocks  
can be interlinked,  
modular expansion capability

Extended temperature range and  
exposure to media

**6AG1052-1CC08-7BA1**

##### SIPLUS LOGO! 12/24RCE

12...24 V DC supply voltage,  
8 digital inputs 12/24 V DC,  
of which 4 can be used  
in analog mode (0 to 10 V),  
4 relay outputs 10 A,  
integrated time switch,  
Ethernet interface;  
400 function blocks  
can be interlinked,  
modular expansion capability

Extended temperature range and  
exposure to media

**6AG1052-1MD08-7BA1**

##### SIPLUS LOGO! 24RCE

24 V AC/DC supply voltage,  
8 digital inputs 24 V AC/DC,  
4 relay outputs 10 A,  
integrated time switch,  
Ethernet interface;  
400 function blocks  
can be interlinked,  
modular expansion capability

Extended temperature range and  
exposure to media

**6AG1052-1HB08-7BA1**

##### SIPLUS LOGO! 230RCE

115...230 V AC/DC supply voltage,  
8 digital inputs 115...230 V AC/DC,  
4 relay outputs 10 A,  
integrated time switch,  
Ethernet interface;  
400 function blocks  
can be interlinked,  
modular expansion capability

Extended temperature range and  
exposure to media

**6AG1052-1FB08-7BA1**

#### Accessories

##### SIPLUS LOGO! TDE

(Extended temperature range  
-25 ... +60 °C (start-up -20 °C)  
and exposure to media)

6-line text display, can be  
connected to all LOGO! 8 variants  
with and without display,  
with 2 Ethernet interfaces;  
incl. installation accessories.  
Requires additional 12 V DC or  
24 V AC/DC power supply

**6AG1055-4MH08-2BA1**

##### LOGO!Soft Comfort V8

For programming on the PC  
in LAD/FBD;  
executes on Windows 8, 7, XP,  
Linux and Mac OSX; on DVD

**6ED1058-0BA08-0YA1**

##### Front panel mounting set

Width 8 MW, with keys

**6AG1057-1AA00-0AA2**

# LOGO! logic modules

## LOGO! basic and expansion modules

### SIPLUS LOGO! basic modules with display

#### Technical specifications

Article number	6AG1052-1CC08-7BA1	6AG1052-1MD08-7BA1	6AG1052-1FB08-7BA1	6AG1052-1HB08-7BA1
Based on	6ED1052-1CC08-0BA1 SIPLUS LOGO! 24CE	6ED1052-1MD08-70BA1 SIPLUS LOGO! 12/24RCE	6ED1052-1HB08-0BA1 SIPLUS LOGO! 230RCE	6ED1052-1FB08-0BA1 SIPLUS LOGO! 24RCE
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C
• max.	60 °C; = Tmax	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)
• At cold restart, min.	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

**Technical specifications**

Article number	<b>6AG1052-1CC08-7BA1</b>	<b>6AG1052-1MD08-7BA1</b>	<b>6AG1052-1FB08-7BA1</b>	<b>6AG1052-1HB08-7BA1</b>
Based on	<b>6ED1052-1CC08-0BA1</b> SIPLUS LOGO! 24CE	<b>6ED1052-1MD08-70BA1</b> SIPLUS LOGO! 12/24RCE	<b>6ED1052-1HB08-0BA1</b> SIPLUS LOGO! 230RCE	<b>6ED1052-1FB08-0BA1</b> SIPLUS LOGO! 24RCE
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## LOGO! logic modules

LOGO! basic and expansion modules

### SIPLUS LOGO! basic modules without display

#### Overview



- Basic variants optimized for costs
- Interface for connecting expansion modules, up to 24 digital inputs, 16 (20) digital outputs, 8 analog inputs and 2 (8) analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 basic variants)

#### New for SIPLUS LOGO! 8

- All basic units with integrated web server
- Same enclosure width as LOGO! 0BA6 (4 MW)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controllers, SIMATIC Panel and PC
- Use of standard micro CF cards

#### Note:

SIPLUS LOGO! 6 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### SIPLUS LOGO! 8 logic module

##### SIPLUS LOGO! 24CEo

24 V DC supply voltage  
8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V)  
4 digital outputs 24 V DC, 0.3 A,  
Integrated time switch  
Ethernet interface;  
without display and keyboard  
400 function blocks can be interlinked,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-2CC08-7BA1**

##### SIPLUS LOGO! 230RCEo

115...230 V AC/DC supply voltage  
8 digital inputs 115...230 V AC/DC  
4 relay outputs 10 A  
Integrated time switch  
Ethernet interface;  
without display or keyboard  
400 function blocks can be interlinked,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-2FB08-7BA1**

##### SIPLUS LOGO! 24RCEo

24 V AC/DC supply voltage,  
8 digital inputs 24 V AC/DC,  
4 relay outputs 10 A,  
integrated time switch,  
Ethernet interface;  
without display or keyboard;  
400 function blocks can be interlinked,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-2HB08-7BA1**

##### SIPLUS LOGO! 12/24RCEo

12...24 V DC supply voltage  
8 digital inputs 12...24 V DC, of which 4 can be used in analog mode (0 to 10 V)  
4 relay outputs 10 A  
Integrated time switch  
Ethernet interface;  
without display and keyboard  
400 function blocks can be interlinked,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-2MD08-7BA1**

#### Accessories

##### SIPLUS LOGO! TDE

(Extended temperature range -25 ... +60 °C (start-up -20 °C) and exposure to media)

6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply

**6AG1055-4MH08-2BA1**

##### LOGO!Soft Comfort V8

For programming on the PC in LAD/FBD;  
executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD

**6ED1058-0BA08-0YA1**

##### Front panel mounting set

Width 8 MW, with keys

**6AG1057-1AA00-0AA2**

**Technical specifications**

Article number	<b>6AG1052-1CC08-7BA1</b>	<b>6AG1052-1MD08-7BA1</b>	<b>6AG1052-1HB08-7BA1</b>	<b>6AG1052-1FB08-7BA1</b>
Based on	<b>6ED1052-2CC08-0BA1</b> SIPLUS LOGO! 24CE	<b>6ED1052-2MD08-0BA1</b> SIPLUS LOGO! 12/24RCE	<b>6ED1052-2HB08-0BA1</b> SIPLUS LOGO! 24RCE	<b>6ED1052-2FB08-0BA1</b> SIPLUS LOGO! 230RCE
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C
• max.	60 °C; = Tmax	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay
• At cold restart, min.	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

## LOGO! logic modules

### LOGO! basic and expansion modules

#### SIPLUS LOGO! basic modules without display

#### Technical specifications

Article number	6AG1052-1CC08-7BA1	6AG1052-1MD08-7BA1	6AG1052-1HB08-7BA1	6AG1052-1FB08-7BA1
Based on	6ED1052-2CC08-0BA1	6ED1052-2MD08-0BA1	6ED1052-2HB08-0BA1	6ED1052-2FB08-0BA1
	SIPLUS LOGO! 24CE	SIPLUS LOGO! 12/24RCE	SIPLUS LOGO! 24RCE	SIPLUS LOGO! 230RCE
<b>Usage in industrial process technology</b>				
<ul style="list-style-type: none"> <li>- Against chemically active substances acc. to EN 60654-4</li> <li>- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
<ul style="list-style-type: none"> <li>- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
<ul style="list-style-type: none"> <li>• Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>• Protection against fouling acc. to EN 60664-3</li> <li>• Military testing according to MIL-I-46058C, Amendment 7</li> <li>• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection	Yes; Class 2 for high reliability Yes; Type 1 protection	Yes; Class 2 for high reliability Yes; Type 1 protection	Yes; Class 2 for high reliability Yes; Type 1 protection
	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

#### Overview



- Expansion modules for connection to LOGO! modular
- With digital inputs and outputs, analog inputs, or analog outputs

#### Note:

SIPLUS LOGO! 6 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

#### Ordering data

#### Article No.

<b>SIPLUS LOGO! 8 expansion modules</b>	
<b>SIPLUS LOGO! DM8 24</b> 24 V DC supply voltage, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A  Extended temperature range and exposure to media	<b>6AG1055-1CB00-7BA2</b>
<b>SIPLUS LOGO! DM8 230R</b> 115...230 V AC/DC supply voltage, 4 digital inputs 115...230 V AC/DC, 4 relay outputs 5 A  Extended temperature range and exposure to media	<b>6AG1055-1FB00-7BA2</b>
<b>SIPLUS LOGO! DM8 24R</b> 24 V AC/DC supply voltage, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A  Extended temperature range and exposure to media	<b>6AG1055-1HB00-7BA2</b>
<b>SIPLUS LOGO! AM2</b> 12...24 V DC supply voltage, 2 analog inputs 0 to 10 V or 0 to 20 mA, 10-bit resolution  Extended temperature range and exposure to media	<b>6AG1055-1MA00-7BA2</b>
<b>SIPLUS LOGO! DM8 12/24R</b> 12...24 V DC supply voltage, 4 digital inputs 12...24 V DC, 4 relay outputs 5 A  Extended temperature range and exposure to media	<b>6AG1055-1MB00-7BA2</b>
<b>LOGO! AM2 RTD</b> 12...24 V DC supply voltage, 2 analog inputs Pt100, temperature range -50 °C to 200 °C  Extended temperature range and exposure to media	<b>6AG1055-1MD00-7BA2</b>
<b>SIPLUS LOGO! AM2 AQ</b> 24 V DC supply voltage, 2 analog outputs 0 to 10 V, 0/4 to 20 mA  Extended temperature range and exposure to media	<b>6AG1055-1MM00-7BA2</b>
<b>SIPLUS LOGO! DM16 24R</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 relay outputs 5 A  Extended temperature range and exposure to media	<b>6AG1055-1NB10-7BA2</b>
<b>Accessories</b>	
<b>LOGO!Soft Comfort V8</b>  For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	<b>6ED1058-0BA08-0YA1</b>
<b>Front panel mounting set</b>  Width 8 MW, with keys	<b>6AG1057-1AA00-0AA2</b>

# LOGO! logic modules

## LOGO! basic and expansion modules

### SIPLUS LOGO! expansion modules

#### Technical specifications

Article number	6AG1055-1CB00-7BA2	6AG1055-1HB00-7BA2	6AG1055-1MB00-7BA2
Based on	6ED1055-1CB00-0BA2 SIPLUS LOGO! DM8 24 V8	6ED1055-1HB00-0BA2 SIPLUS LOGO! DM8 24R V8	6ED1055-1MB00-0BA2 SIPLUS LOGO! DM8 12/24R V8
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!



**Technical specifications**

Article number	<b>6AG1055-1CB00-7BA2</b>	<b>6AG1055-1HB00-7BA2</b>	<b>6AG1055-1MB00-7BA2</b>
Based on	<b>6ED1055-1CB00-0BA2</b> SIPLUS LOGO! DM8 24 V8	<b>6ED1055-1HB00-0BA2</b> SIPLUS LOGO! DM8 24R V8	<b>6ED1055-1MB00-0BA2</b> SIPLUS LOGO! DM8 12/24R V8
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	<b>6AG1055-1FB00-7BA2</b>	<b>6AG1055-1NB10-7BA2</b>	
Based on	<b>6ED1055-1FB00-0BA2</b> SIPLUS LOGO! DM8 230R V8	<b>6ED1055-1NB10-0BA2</b> SIPLUS LOGO! DM16 24R V8	
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> <li>At cold restart, min.</li> </ul>	-40 °C; = Tmin; Startup @ -25 °C 70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A -25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-40 °C; = Tmin; Startup @ -25 °C 70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay -25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	
<b>Use on ships/at sea</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	
<b>Usage in industrial process technology</b>			
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
<b>Remark</b>			
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	

**LOGO! logic modules**

## LOGO! basic and expansion modules

**SIPLUS LOGO! expansion modules****Technical specifications**

Article number	<b>6AG1055-1FB00-7BA2</b>	<b>6AG1055-1NB10-7BA2</b>
Based on	<b>6ED1055-1FB00-0BA2</b> SIPLUS LOGO! DM8 230R V8	<b>6ED1055-1NB10-0BA2</b> SIPLUS LOGO! DM16 24R V8
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>
Article number	<b>6AG1055-1MA00-7BA2</b>	<b>6AG1055-1MD00-7BA2</b>
Based on	<b>6ED1055-1MA00-0BA2</b> SIPLUS LOGO! AM2 V8	<b>6ED1055-1MD00-0BA2</b> SIPLUS LOGO! AM2 RTD
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> <li>At cold restart, min.</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin; Startup @ -25 °C</li> <li>70 °C; = Tmax</li> <li>-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin; Startup @ -25 °C</li> <li>70 °C; = Tmax</li> <li>-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)</li> </ul>
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	<ul style="list-style-type: none"> <li>5 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) //</li> <li>Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) //</li> <li>Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)</li> </ul>	<ul style="list-style-type: none"> <li>5 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) //</li> <li>Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) //</li> <li>Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)</li> </ul>
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> </ul>
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request</li> <li>Yes; Class 6C3 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 6S3 incl. sand, dust; *</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request</li> <li>Yes; Class 6C3 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 6S3 incl. sand, dust; *</li> </ul>
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3 (excluding trichlorethylene)</li> <li>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3 (excluding trichlorethylene)</li> <li>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</li> </ul>
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

**Technical specifications**

Article number	<b>6AG1055-1MA00-7BA2</b>	<b>6AG1055-1MD00-7BA2</b>	
Based on	<b>6ED1055-1MA00-0BA2</b> SIPLUS LOGO! AM2 V8	<b>6ED1055-1MD00-0BA2</b> SIPLUS LOGO! AM2 RTD	
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	
Article number	<b>6AG1055-1MM00-7BA2</b>	Article number	<b>6AG1055-1MM00-7BA2</b>
Based on	<b>6ED1055-1MM00-0BA2</b> SIPLUS LOGO! AM2 AQ V8	Based on	<b>6ED1055-1MM00-0BA2</b> SIPLUS LOGO! AM2 AQ V8
<b>Ambient conditions</b>		<b>Usage in industrial process technology</b>	
<b>Ambient temperature during operation</b>		<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3 (excluding trichlorethylene)</li> <li>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</li> </ul>
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> <li>At cold restart, min.</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin; Startup @ -25 °C</li> <li>70 °C; = Tmax</li> <li>-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)</li> </ul>	<b>Remark</b>	<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>
<b>Altitude during operation relating to sea level</b>		<b>Conformal coating</b>	
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	<ul style="list-style-type: none"> <li>5 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)</li> </ul>	<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	<ul style="list-style-type: none"> <li>100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation</li> </ul>		
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Incl. diesel and oil droplets in the air</li> </ul>		
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> </ul>		
<b>Use on ships/at sea</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request</li> <li>Yes; Class 6C3 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 6S3 incl. sand, dust; *</li> </ul>		

## LOGO! logic modules

### LOGO! communications modules

#### Introduction

#### Overview

2



- Communications modules for connecting LOGO! Modular to different bus systems.

#### Note on compatibility:

Communications module	Can be used with:
LOGO! CMK2000 communications module	LOGO! ...0BA8
LOGO! CSM 12/24	LOGO! ...0BA7/...0BA8
LOGO! CSM 230	LOGO! ...0BA7
LOGO! CMR2020	LOGO! ...0BA8
LOGO! CMR2040	LOGO! ...0BA8

**Overview**


- Expansion module for LOGO! 8 basic versions
- For integrating LOGO! 8 in KNX installations
- With 24 digital inputs, 20 digital outputs as well as 8 analog inputs and outputs for processing process signals via KNX.

**Ordering data**
**Article No.**
**LOGO! CMK2000 communications module**
**6BK1700-0BA20-0AA0**

For integrating LOGO! 8 in the KNX building system bus, max. 50 communication objects can be configured;  
 RJ45 port for Ethernet;  
 supply voltage 24 V DC/40 mA

**Technical specifications**

Article number	<b>6BK1700-0BA20-0AA0</b> LOGO! CMK2000
<b>General information</b>	
Firmware version	
• FW update possible	Yes
<b>Installation type/mounting</b>	
Mounting	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>	
Rated value (DC)	24 V
• 12 V DC	No
• 24 V DC	Yes
Rated value (AC)	
• 24 V AC	No
<b>Input current</b>	
Current consumption, max.	0.04 A
<b>Power loss</b>	
Power loss, max.	1.1 W
<b>Memory</b>	
Flash	Yes
<b>Time of day</b>	
<b>Clock synchronization</b>	
• supported	Yes

Article number	<b>6BK1700-0BA20-0AA0</b> LOGO! CMK2000
<b>Interfaces</b>	
Number of industrial Ethernet interfaces	1; Ethernet, 1 port, RJ45
Number of other interfaces	1; EIB/KNX
Transmission rate, max.	100 Mbit/s over Ethernet, 9 600 bit/s over KNX
Design of plug-in connection	KNX terminal 0.6 mm <sup>2</sup> - 1.0 mm <sup>2</sup>
<b>Protocols</b>	
EIB/KNX	Yes
<b>Web server</b>	
• supported	Yes
<b>Communication functions</b>	
<b>S7 basic communication</b>	
• supported	No
<b>LOGO! communication</b>	
• supported	Yes
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostics indication LED</b>	
• RUN/STOP LED	Yes
<b>EMC</b>	
<b>Emission of radio interference acc. to EN 55 011</b>	
• Limit class B, for use in residential areas	Yes; In accordance with EN 61000-6-3
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	No
KC approval	Yes
EAC (formerly Gost-R)	Yes
according to VDE 0631	No
Marine approval	No
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C
<b>Relative humidity</b>	
• Operation, max.	95 %
<b>Connection method</b>	
Design of electrical connection for supply voltage	2 screw-type terminals: L+, M 0.5 mm <sup>2</sup> - 2.5 mm <sup>2</sup> Screw-type terminal: FE 0.5 mm <sup>2</sup> ... 6.0 mm <sup>2</sup>
<b>Dimensions</b>	
Width	71.5 mm; 4TE
Height	90 mm
Depth	58.5 mm
<b>Weights</b>	
Weight, approx.	0.14 kg

## LOGO! logic modules

### LOGO! communications modules

#### LOGO! CSM unmanaged

##### Overview



The module is used to connect a LOGO! and up to three other nodes to an Industrial Ethernet network with 10/100 Mbps in an electrical linear, tree or star topology.

The essential features of the LOGO! CSM are:

- Unmanaged 4-port switch, of which one port is on the front for easy diagnostics access
- Two versions for the voltage ranges 12/24 V DC or 230 V AC/DC
- Problem-free connection using four RJ45 standard connectors
- Space-saving, optimized for connection to LOGO!
- Low-cost solution for implementing small, local Ethernet networks
- Stand-alone use for networking any Ethernet devices

##### Ordering data

##### Article No.

###### LOGO! CSM compact switch modules

Unmanaged switch for connection of one LOGO! and up to three further nodes on Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; LED diagnostics, LOGO! module

- **LOGO! CSM12/24**  
external 12 V DC or 24 V DC power supply, for LOGO! ... 0BA7/... 0BA8
- **LOGO! CSM230**  
external 115 ... 240 V AC power supply, for LOGO! ... 0BA7

6GK7177-1MA20-0AA0

6GK7177-1FA10-0AA0

###### Accessories

###### IE TP cord RJ45/RJ45

TP cable 4 x 2 with 2 RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

6XV1870-3QE50  
6XV1870-3QH10  
6XV1870-3QH20  
6XV1870-3QH60  
6XV1870-3QN10

###### IE FC outlet RJ45

For connection of Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more

6GK1901-1FC00-0AA0

**Technical specifications**

Article number	6GK7177-1FA10-0AA0	6GK7177-1MA20-0AA0
product type designation	LOGO! CSM 230	LOGO! CSM 12/24
<b>transfer rate</b>		
transfer rate	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
<b>interfaces for communication integrated</b>		
number of electrical connections		
• for network components or terminal equipment	4	4
number of 100 Mbit/s SC ports		
• for multimode	0	0
number of 1000 Mbit/s LC ports		
• for multimode	0	0
• for single mode (LD)	0	0
<b>interfaces other</b>		
number of electrical connections		
• for power supply	1	1
type of electrical connection		
• for power supply	3-pole terminal block	3-pole terminal block
<b>supply voltage, current consumption, power loss</b>		
type of voltage 1 of the supply voltage	DC	DC
• supply voltage 1 rated value	230 V	24 V
• power loss [W] 1 rated value		1.5 W
• supply voltage 1 rated value	100 ... 240 V	10.2 ... 30.2 V
• consumed current 1 maximum	0.02 A	0.15 A
• type of electrical connection 1 for power supply	3-pole terminal block	3-pole terminal block
• product component 1 fusing at power supply input	Yes	Yes
type of voltage 2 of the supply voltage		
• supply voltage 2 rated value	100 ... 240 V	
<b>ambient conditions</b>		
ambient temperature		
• during operation	0 ... 55 °C	0 ... 55 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
relative humidity		
• at 25 °C without condensation during operation maximum	90 %	90 %
protection class IP	IP20	IP20
<b>design, dimensions and weights</b>		
design	LOGO! module	LOGO! module
width	72 mm	71.5 mm
height	90 mm	90 mm
depth	55 mm	58.2 mm
net weight	0.155 kg	0.15 kg
fastening method		
• 35 mm top hat DIN rail mounting	Yes	Yes
• wall mounting	Yes	Yes
• S7-300 rail mounting	No	No
• S7-1500 rail mounting	No	No

**LOGO! logic modules**

## LOGO! communications modules

**LOGO! CSM unmanaged****Technical specifications**

Article number	<b>6GK7177-1FA10-0AA0</b>	<b>6GK7177-1MA20-0AA0</b>
product type designation	LOGO! CSM 230	LOGO! CSM 12/24
<b>product functions management, configuration, engineering</b>		
product function		
• multiport mirroring	No	No
product function switch-managed	No	No
<b>standards, specifications, approvals</b>		
standard		
• for FM	FM3600 and 3611: CL. I, Div2, Group A,B,C,D T4, CL I, Zone 2, Group IIC, T4, Ta=55°C	
• for safety from CSA and UL	UL60079-0, UL60079-15, CSA C22.2	UL 508, CSA C22.2 No. 142
<b>standards, specifications, approvals CE</b>		
certificate of suitability CE marking	Yes	Yes
<b>standards, specifications, approvals hazardous environments</b>		
standard for hazardous zone	no	ATEX: EN 60079-0 : 2009, EN 60079-15 :2010 (Directive 94/9/EC), IECEx: IEC 60079-0 :2011, IEC 60079-15 :2010
• from CSA and UL		Haz-Loc ANSI/ISA 12.12.01: CL. I, Div2, Group A,B,C,D T4, CL I, Zone 2, Group IIC, T4, Ta=55°C
certificate of suitability		Yes
• CCC for hazardous zone according to GB standard		
<b>standards, specifications, approvals other</b>		
certificate of suitability		
• C-Tick	Yes	Yes
• KC approval	No	No
<b>standards, specifications, approvals marine classification</b>		
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	No	No
• French marine classification society (BV)	No	No
• Det Norske Veritas (DNV)	No	No
• Germanische Lloyd (GL)	No	No
• Lloyds Register of Shipping (LRS)	No	No
• Nippon Kaiji Kyokai (NK)	No	No
• Polski Rejestr Statkow (PRS)	No	No



#### Overview



LOGO! CMR in combination with the LOGO! logic module is a cost-efficient communication system suitable for monitoring and controlling distributed plants and systems via text message or email.

LOGO! CMR can send text messages or emails to predefined mobile network numbers as well as receive text messages from predefined mobile network numbers.

Sending a text message/email can be initiated by events in the LOGO! basic module as well as by the two digital alarm inputs of the LOGO! CMR. The values in the LOGO! logic module can be directly influenced by receiving a text message.

The LOGO! CMR offers comfortable Web Based Management commissioning and diagnostics via local and/or remote access.

The two digital outputs can also be switched remotely by incoming text messages/emails.

LOGO! CMR determines the current position of the module based on the GPS signal received by the GPS antenna. In addition, the LOGO! 8 logic module can be time-synchronized by means of the time included in the GPS signal. Determination of time by means of an NTP server or from the data of the mobile network provider offers more options for synchronization of the LOGO! BM with the current time of day.

#### Product version:

- LOGO! CMR2020 for use in GSM/GPRS mobile wireless networks
- LOGO! CMR2040 for use in LTE mobile wireless networks

Warning! The country-specific mobile network approvals must be observed:

DE: <http://www.siemens.de/mobilfunkzulassungen>

EN: <http://www.siemens.com/mobilenetwork-approvals>

#### Ordering data

#### Article No.

#### Communications Module Radio LOGO! CMR

Communications modules for connection of LOGO! 8 to GSM/GPRS or LTE network;  
1x RJ45 port for Industrial Ethernet connection;  
2x digital input; 2x digital output;  
read/write access to LOGO! tags;  
possible to send/receive text messages;  
GPS position detection; time-of-day synchronization/forwarding with real time clock; configuration and diagnostics per web interface;  
Note country approvals:  
[www.siemens.com/mobilenetwork-approvals](http://www.siemens.com/mobilenetwork-approvals)

#### LOGO! CMR2020

For connecting LOGO! 8 to a GSM/GPRS network

**6GK7142-7BX00-0AX0**

#### LOGO! CMR2040

For connecting LOGO! 8 to an LTE network

**6GK7142-7EX00-0AX0**

#### Accessories

#### Mobile wireless antennas

#### ANT794-4MR

For indoor and outdoor use;  
5 m connecting cable permanently connected to antenna;  
SMA connector; incl. installation bracket, screws, wall anchors

**6NH9860-1AA00**

#### ANT896-4MA

Rod antenna for direct mounting on device; SMA male connector

**6GK5896-4MA00-0AA3**

#### ANT896-4ME

Cylinder-shaped antenna for remote installation, e.g. on a control cabinet; N-Connect female connector

**6GK5896-4ME00-0AA0**

#### GPS antenna

#### ANT895-6ML

GPS/Glonass antenna for remote installation indoor and outdoor, magnet or screw mounting, 30 cm cable with N-Connect female connector

**6GK5895-6ML00-0AA0**

#### Antenna adapter cable

N-Connect/SMA male/male flexible connecting cable, pre-assembled, connecting cable;  
suitable for 0 ... 6 GHz, IP68

- 0.3 m
- 1 m
- 2 m
- 5 m

**6XV1875-5LE30**  
**6XV1875-5LH10**  
**6XV1875-5LH20**  
**6XV1875-5LH50**

**LOGO! logic modules**

LOGO! communications modules

**LOGO! CMR (wireless communication)**

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**Ordering data****Article No.****IWLAN RCoax/antenna  
N-Connect male/male  
flexible connecting cable**

Flexible connecting cable for connecting an RCoax cable or antenna to a SCALANCE W-700 Access Point with N-Connect connectors; pre-assembled with two N-Connect male connectors; suitable from 0 ... 6 GHz, IP68

- 1 m
- 2 m
- 5 m
- 10 m

**6XV1875-5AH10**  
**6XV1875-5AH20**  
**6XV1875-5AH50**  
**6XV1875-5AN10**

**Cabinet feedthrough**

IWLAN RCOAX N-Connect/ N-Connect female/female panel feedthrough; Control cabinet feedthrough for wall thickness max. 4.5 mm; 2.4 GHz and 5 GHz, suitable from 0 ... 6 GHz, IP67

**6GK5798-2PP00-2AA6**

**Lightning protector LP798-2N**

Lightning protector with N/N female/female connection for ANT 790 antennas, IP67 (-40 to +85 °C), frequency range: 0 ... 6 GHz

**6GK5798-2LP00-2AA6**

**Patch cable****IE TP Cord RJ45/RJ45**

TP cable 4 x 2 with 2 RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

**6XV1870-3QE50**  
**6XV1870-3QH10**  
**6XV1870-3QH20**  
**6XV1870-3QH60**  
**6XV1870-3QN10**

**IE FC RJ45 outlet**

For connection of Industrial Ethernet FC cables and TP Cords; graduated prices for 10 and 50 units or more

**6GK1901-1FC00-0AA0**

**LOGO! CSM12/24**

Compact Switch Module for connecting a LOGO! (...0BA7/...0BA8) and up to 3 additional nodes to Industrial Ethernet; 12/24 V DC power supply

**6GK7177-1MA20-0AA0**

**LOGO! CSM230**

Compact Switch Module for connecting a LOGO! (... 0BA7) and up to 3 additional nodes to Industrial Ethernet 115 ... 240 V AC/DC power supply

**6GK7177-1FA10-0AA0**

**Article No.****Stainless steel enclosure  
in IP68 degree of protection**

Stainless steel enclosure in IP68 degree of protection; suitable for SIMATIC RTU3030C; temperature range -60 to +135 °C; matte surface; cover with Pin Torx screws and padlock 7 cable openings and opening for mobile wireless antenna prepared; please order the needed quantity of cable glands and sealing plugs separately

**6NH3112-3BA00-1XX1**

**Aluminum enclosure  
in IP68 degree of protection**

Aluminum enclosure in IP68 degree of protection; suitable for SIMATIC RTU3030C; temperature range -40 to +80 °C; cover with Pin Torx screws; 7 cable openings and opening for mobile wireless antenna prepared; please order the needed quantity of cable glands and sealing plugs separately

**6NH3112-3BA00-1XX3**

**Cable gland PG16 F  
for IP68 enclosure**

Cable gland, M16, IP68, -40 to +100 °C; nickel-plated brass; suitable for enclosure with article numbers 6NH3112-3BA00-1x X1 and 6NH3112-3BA00-1x X3 pack quantity = 2 units

**6NH3112-3BA00-1XX4**

**Sealing plug M16  
for IP68 enclosure**

Sealing plug, M16, IP68, -40 to +100 °C; nickel-plated brass; suitable for enclosure with article numbers 6NH3112-3BA00-1x X1 and 6NH3112-3BA00-1x X3, pack quantity = 2 units

**6NH3112-3BA00-1XX5**

**Technical specifications**

Article number	<b>6GK7142-7BX00-0AX0</b>	<b>6GK7142-7EX00-0AX0</b>
product type designation	LOGO! CMR2020	LOGO! CMR2040
<b>transfer rate</b>		
transfer rate		
• at the 1st interface	10 ... 100 Mbit/s	10 ... 100 Mbit/s
• for GPRS transmission		
- with downlink maximum	80 kbit/s	85.6 kbit/s
- with uplink maximum	40 kbit/s	85.6 kbit/s
• for LTE transmission		
- with downlink maximum		100 Mbit/s
- with uplink maximum		50 Mbit/s
<b>interfaces</b>		
number of interfaces acc. to Industrial Ethernet	1	1
number of electrical connections		
• at the 1st interface acc. to Industrial Ethernet	1	1
• for external antenna(s)	2	2
• for power supply	1	1
number of slots		
• for SIM cards	1	1
• for memory cards	1	1
type of electrical connection		
• at the 1st interface acc. to Industrial Ethernet	RJ45 port	RJ45 port
type of electrical connection		
• for external antenna(s)	SMA socket (50 ohms)	SMA socket (50 ohms)
• for power supply	3-pole terminal block	3-pole terminal block
type of antenna		
• at connection 1 connectable	GPS Antenna	GPS Antenna
• at connection 2 connectable	Mobile radio antenna (GPRS/GSM)	Mobile radio antenna (GPRS/GSM, UMTS, LTE)
wire length of antenna wire maximum	15 m	15 m
slot version		
• for SIM card	Standard	Standard
• of the memory card	microSD	microSD
storage capacity of the memory card maximum	32 Gbyte	32 Gbyte
performance class of the memory card minimum necessary	Class 6	Class 6
type of file system type of file system	FAT32	FAT32
<b>signal inputs/outputs</b>		
number of electrical connections for digital input signals	2	2
type of electrical connection for digital input signals	3 pole terminal block	3 pole terminal block
digital input version	not galvanically isolated, not debounced	not galvanically isolated, not debounced
input voltage at digital input		
• with signal <0> at DC	0 ... 5 V	0 ... 5 V
• for signal <1> at DC	8.5 ... 24 V	8.5 ... 24 V
input current at digital input for signal <1> maximum	5.5 mA	5.5 mA
number of electrical connections for digital output signals	2	2

**LOGO! logic modules**

## LOGO! communications modules

**LOGO! CMR (wireless communication)****Technical specifications**

Article number	<b>6GK7142-7BX00-0AX0</b>	<b>6GK7142-7EX00-0AX0</b>
product type designation	LOGO! CMR2020	LOGO! CMR2040
type of electrical connection for digital output signals	3 pole terminal block	3 pole terminal block
digital output version	transistor, not potential seperated	transistor, not potential seperated
output voltage at digital output	12 ... 24 V; Value of the actual supply voltage	12 ... 24 V; Value of the actual supply voltage
<ul style="list-style-type: none"> <li>for signal &lt;1&gt;</li> <li>for signal &lt;0&gt;</li> </ul>	0 ... 5 V	0 ... 5 V
output current at digital output for signal <1> maximum	0.3 A	0.3 A
<b>wireless technology</b>		
type of mobile wireless service		
<ul style="list-style-type: none"> <li>is supported SMS</li> <li>is supported GPRS</li> <li>note</li> </ul>	Yes Yes GPRS (Multislot Class 10, Mobile Station Class B)	Yes Yes LTE
type of wireless network is supported		
<ul style="list-style-type: none"> <li>GSM</li> <li>UMTS</li> <li>LTE</li> </ul>	Yes No No	Yes Yes Yes
operating frequency for GSM transmission	operating frequency for GSM transmission 850 MHz, operating frequency for GSM transmission 900 MHz, operating frequency for GSM transmission 1800 MHz, operating frequency for GSM transmission 1900 MHz	operating frequency for GSM transmission 900 MHz, operating frequency for GSM transmission 1800 MHz
operating frequency with UMTS transmission		operating frequency with UMTS transmission 850 MHz, operating frequency with UMTS transmission 900 MHz, operating frequency with UMTS transmission 2100 MHz
operating frequency for LTE transmission		operating frequency for LTE transmission 800 MHz, operating frequency for LTE transmission 1800 MHz, operating frequency for LTE transmission 2600 MHz
<b>supply voltage, current consumption, power loss</b>		
type of voltage of the supply voltage	DC	DC
supply voltage external	12 ... 24 V	12 ... 24 V
supply voltage external at DC	12 ... 24 V	12 ... 24 V
supply voltage for GPS antenna maximum	3.8 V; at 5 mA: 3,575 V / at 10 mA: 3,35 V / at 15 mA: 3,125 V	3.8 V; at 5 mA: 3,575 V / at 10 mA: 3,35 V / at 15 mA: 3,125 V
relative positive tolerance at DC at 24 V	20 %	20 %
relative negative tolerance at DC at 12 V	10 %	10 %
consumed current		
<ul style="list-style-type: none"> <li>from external supply voltage at DC at 12 V maximum</li> <li>from external supply voltage at DC at 24 V maximum</li> </ul>	0.25 A 0.125 A	0.25 A 0.125 A
output current for GPS antenna maximum	15 mA	15 mA
power loss [W]	3 W	3 W
<b>ambient conditions</b>		
ambient temperature		
<ul style="list-style-type: none"> <li>during operation</li> <li>during storage</li> <li>during transport</li> </ul>	-20 ... +70 °C -40 ... +85 °C -40 ... +85 °C	-20 ... +70 °C -40 ... +85 °C -40 ... +85 °C
relative humidity		
<ul style="list-style-type: none"> <li>at 25 °C without condensation during operation maximum</li> </ul>	95 %	95 %
protection class IP	IP20	IP20

**Technical specifications**

Article number	<b>6GK7142-7BX00-0AX0</b>	<b>6GK7142-7EX00-0AX0</b>
product type designation	LOGO! CMR2020	LOGO! CMR2040
<b>design, dimensions and weights</b>		
module format	Compact module, for rail mounting	Compact module, for rail mounting
width	71.5 mm	71.5 mm
height	90 mm	90 mm
depth	58.2 mm	58.2 mm
net weight	0.16 kg	0.16 kg
fastening method		
• 35 mm top hat DIN rail mounting	Yes	Yes
• wall mounting	Yes	Yes
<b>product features, product functions, product components general</b>		
product function		
• DynDNS client	Yes	Yes
• no-ip.com client	Yes	Yes
<b>performance data</b>		
number of possible connections to the LOGO! logic module	1	1
number of users/telephone numbers/email addresses definable maximum	20	20
number of user groups definable maximum	10	10
number of signals for monitoring or device control definable maximum	32	32
number of events for monitoring definable maximum	32	32
number of actions definable maximum	32	32
number of assignments definable maximum	32	32
number of alias SMS commands definable maximum	20	20
number of constants definable maximum	10	10
<b>performance data IT functions</b>		
number of possible connections		
• as server by means of HTTP maximum	2	2
• as server by means of HTTPS maximum	2; http and https can be combined (max. number of 2 connections cannot be exceeded). Max. one connection via https is possible on the mobile wireless interface.	2; http and https can be combined (max. number of 2 connections cannot be exceeded). Max. one connection via https is possible on the mobile wireless interface.
• as email client maximum	1	1
number of free texts for emails and SMS maximum	20	20
number of characters per free text for emails or SMS maximum	160	160
<b>performance data teleservice</b>		
product function		
• remote firmware update	Yes	Yes
• remote configuration	Yes	Yes
<b>product functions management, configuration, engineering</b>		
configuration software		
• required	Web interface	Web interface
<b>product functions diagnostics</b>		
product function web-based diagnostics	Yes	Yes

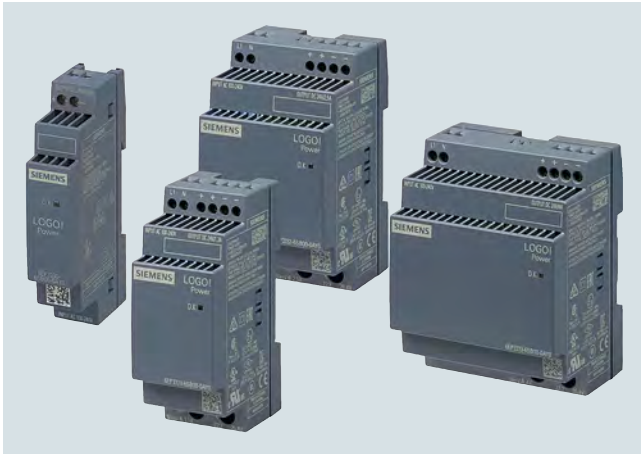
**LOGO! logic modules**

## LOGO! communications modules

**LOGO! CMR (wireless communication)****Technical specifications**

Article number	<b>6GK7142-7BX00-0AX0</b>	<b>6GK7142-7EX00-0AX0</b>
product type designation	LOGO! CMR2020	LOGO! CMR2040
<b>product functions security</b>		
operating mode Virtual Private Network (VPN)	Yes; Open VPN Server in PSK mode	Yes; Open VPN Server in PSK mode
product function with VPN connection	OpenVPN PSK	OpenVPN PSK
type of encryption algorithms with VPN connection	AES-128 CBC	AES-128 CBC
type of authentication with Virtual Private Network PSK	Yes	Yes
type of hashing algorithms with VPN connection	SHA-256	SHA-256
number of possible connections with VPN connection	1	1
product function		
• password protection for Web applications	Yes	Yes
• password protection for VPN	Yes	Yes
• encrypted data transmission	Yes	Yes
• switch-off of non-required services	Yes	Yes
• log file for unauthorized access	Yes	Yes
<b>product functions time</b>		
product function pass on time synchronization	Yes	Yes
accuracy of the hardware real time clock per day maximum	7.5 s	7.5 s
time synchronization		
• from NTP-server	Yes	Yes
• from GPS-signal	Yes	Yes
• from mobile network provider	Yes	Yes
• PC	Yes	Yes
• manual setting	Yes	Yes
<b>product functions position detection</b>		
product function		
• position detection with GPS	Yes	Yes
• pass on position data	Yes	Yes
<b>standards, specifications, approvals hazardous environments</b>		
certificate of suitability CCC for hazardous zone according to GB standard	Yes	Yes

## Overview



### The flat power supply unit for distribution boards

Small. Clever. LOGO!Power: Thanks to its stepped profile design, the LOGO! 8 product line is ideally suited for installation in small distribution boards. The 12 V and 24 V versions are ideal for supplying LOGO! controllers with the corresponding voltage input. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to the integrated current monitor. The extended ambient temperature range from -25 °C to +70 °C enables a host of additional applications.

To further increase 24 V availability, the 24 V LOGO!Power power supplies can be combined with the **buffer module BUF1200**, **DC UPS**, **redundancy** and **selectivity modules**.

This powerhouse can be used in any industry: e.g. in building technology applications for light and heating controllers or for access control systems. LOGO!Power is also well-suited for use in industrial automation, such as in packaging machine, machine tool, conveyor belt or sorting system applications.

### Product highlights of the product line

- Low width with minimum of 18 mm to maximum of 72 mm, thus requiring very little space in the control cabinet or distribution board
- High energy efficiency with efficiency levels of up to 90% over the entire performance range and ERP-compliant no-load losses of < 0.3 W
- Global use due to operating temperature range from -25 °C to +70 °C and international certificates
- Supply of NEC Class 2 electric circuits with limited output current (100 VA)
- Load monitoring via current monitor using real-time measurement of the output current without disconnecting the cable, i.e. without interrupting the DC supply
- Flexible mounting with top hat DIN rail or wall mounting in different installation positions
- Flexible operation in all standard 1-phase supply networks thanks to wide-range input of 100 ... 240 V AC without switchover and operation on DC networks with 110 ... 300 V DC
- Reliability due to problem-free connection of loads with high inrush currents thanks to power reserve during startup as well as constant current in the event of overload

Overall width	18 mm	36 mm	54 mm	72 mm
24 V	0.6 A	1.3 A	2.5 A	4.0 A
12 V	0.9 A	1.9 A	4.5 A	
5 V		3.0 A	6.3 A	
15 V		1.9 A	4.0 A	

**LOGO! logic modules**

## LOGO!Power

**1-phase, 5 V DC****Overview**

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Thanks to its stepped profile design, the LOGO!Power product line is ideally suited for installation in small distribution boards. The stabilized power supplies with wide-range input are available with an output voltage of 5 V in two performance classes.

**Product highlights**

- Single-phase, 5 V DC/ 3 A and 6.3 A
- Wide-range input, input voltage 100 ... 240 V AC (85 ... 264 V), 110 ... 300 V DC
- Narrow unit with 36 mm or 54 mm width and overall depth of 53 mm in LOGO! design
- Up to 80% efficiency
- Integrated current monitor: Actual output current measurement directly at the power supply unit
- cULus, cURus, NEC class 2, ABS, DNV GL certifications

**Ordering data****Article No.****Article No.****LOGO!Power 1-phase, 5 V DC/3 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
(110 ... 300 V AC)  
Output: 5 V DC/3 A

**6EP3310-6SB00-0AY0****LOGO!Power 1-phase, 5 V DC/6.3 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
(110 ... 300 V AC)  
Output: 5 V DC/6.3 A

**6EP3311-6SB00-0AY0****Technical specifications**

Article number	<b>6EP3310-6SB00-0AY0</b>	<b>6EP3311-6SB00-0AY0</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
<b>Input</b>		
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in rated}$	100 ... 240 V	100 ... 240 V
Voltage range AC input voltage	85 ... 264 V	85 ... 264 V
• at DC	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes
Overvoltage resistance	300 V AC for 1 s	300 V AC for 1 s
Mains buffering	at $V_{in} = 187$ V	at $V_{in} = 187$ V
Mains buffering at $I_{out rated}$ , min.	40 ms; at $V_{in} = 187$ V	40 ms; at $V_{in} = 187$ V
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range input current	47 ... 63 Hz	47 ... 63 Hz
• at rated input voltage 120 V	0.36 A	0.71 A
• at rated input voltage 230 V	0.22 A	0.37 A
Switch-on current limiting (+25 °C), max.	26 A	50 A
$I^2t$ , max.	0.8 A <sup>2</sup> ·s	3 A <sup>2</sup> ·s
Built-in incoming fuse	internal	internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C



**Technical specifications**

Article number	<b>6EP3310-6SB00-0AY0</b>	<b>6EP3311-6SB00-0AY0</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
<b>Output</b>		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	5 V	5 V
<ul style="list-style-type: none"> <li>output voltage at output 1 at DC rated value</li> </ul>	5 V	5 V
Total tolerance, static $\pm$	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	100 mV	100 mV
Residual ripple peak-peak, typ.	30 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	100 mV	100 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	50 mV	50 mV
Adjustment range	4.6 ... 5.4 V	4.6 ... 5.4 V
product function output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	0.5 s	0.5 s
Voltage rise, typ.	100 ms	100 ms
Rated current value $I_{out}$ rated	3 A	6.3 A
Current range	0 ... 3 A	0 ... 6.3 A
<ul style="list-style-type: none"> <li>Note</li> </ul>	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
supplied active power typical	15 W	31.5 W
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
<b>Efficiency</b>		
Efficiency at $V_{out}$ rated, $I_{out}$ rated, approx.	76 %	80 %
Power loss at $V_{out}$ rated, $I_{out}$ rated, approx.	5 W	8 W
power loss [W] during no-load operation maximum	0.3 W	0.3 W
<b>Closed-loop control</b>		
Dynamic mains compensation ( $V_{in}$ rated $\pm 15$ %), max.	0.2 %	0.2 %
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %), $U_{out} \pm$ typ.	5 %	7 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms
<b>Protection and monitoring</b>		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	3.8 A	8.2 A
property of the output short-circuit proof	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic
enduring short circuit current RMS value		
<ul style="list-style-type: none"> <li>maximum</li> </ul>	3.8 A	8.2 A
overcurrent overload capability in normal operation	overload capability 150% $I_{out}$ rated typ. 200 ms	overload capability 150% $I_{out}$ rated typ. 200 ms
Overload/short-circuit indicator	-	-
measuring point for output current	50 mV $\hat{=}$ 3 A	50 mV $\hat{=}$ 6.3 A
overcurrent overload capability when switching on	150% $I_{out}$ rated typ. 200 ms	150% $I_{out}$ rated typ. 200 ms

# LOGO! logic modules

## LOGO!Power

### 1-phase, 5 V DC

#### Technical specifications

Article number	6EP3310-6SB00-0AY0	6EP3311-6SB00-0AY0
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
<b>Safety</b>		
Primary/secondary isolation galvanic isolation	Yes	Yes
Protection class	Safety extra-low output voltage U <sub>out</sub> acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage U <sub>out</sub> acc. to EN 60950-1 and EN 50178
Degree of protection (EN 60529)	Class II (without protective conductor) IP20	Class II (without protective conductor) IP20
<b>Approvals</b>		
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866
certificate of suitability NEC Class 2	Yes	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
certificate of suitability EAC approval	Yes	Yes
Marine approval	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>environmental conditions</b>		
ambient temperature		
• during operation	-25 ... +70 °C	-25 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>		
Connection technology	screw-type terminals	screw-type terminals
Connections		
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-
width of the enclosure	36 mm	54 mm
height of the enclosure	90 mm	90 mm
depth of the enclosure	53 mm	53 mm
required spacing		
• top	20 mm	20 mm
• bottom	20 mm	20 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.12 kg	0.2 kg
product feature of the enclosure housing can be lined up	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
MTBF at 40 °C	2 931 709 h	2 654 280 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

## Overview



Thanks to its stepped profile design, the LOGO!Power product line is ideally suited for installation in small distribution boards. The stabilized power supplies with wide-range input are available with an output voltage of 12 V in three performance classes. The 12 V versions are ideal for supplying LOGO! PLCs with the corresponding voltage input.

### Product highlights

- Single-phase, 12 V DC/ 0.9 A, 1.9 A and 4.5 A
- Wide-range input, input voltage 100 ... 240 V AC (85 ... 264 V), 110 ... 300 V DC
- Narrow unit with width of 18 mm, 36 mm or 54 mm and overall depth of 53 mm in LOGO! design
- Up to 87.1% efficiency
- Integrated current monitor: Actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- cULus, cURus, NEC class 2, ABS, DNV GL certifications

## Ordering data

### LOGO!Power 1-phase, 12 V DC/0.9 A

Stabilized power supply  
 Input: 100 ... 240 V AC  
 (110 ... 300 V DC)  
 Output: 12 V DC/0.9 A

### Article No.

6EP3320-6SB00-0AY0

### LOGO!Power 1-phase, 12 V DC/1.9 A

Stabilized power supply  
 Input: 100 ... 240 V AC  
 (110 ... 300 V DC)  
 Output: 12 V DC/1.9 A

6EP3321-6SB00-0AY0

### Article No.

### LOGO!Power 1-phase, 12 V DC/4.5 A

Stabilized power supply  
 Input: 100 ... 240 V AC  
 (110 ... 300 V DC)  
 Output: 12 V DC/4.5 A

6EP3322-6SB00-0AY0

### Add-on modules

#### SITOP redundancy modules RED1200

For more information, visit:  
<https://www.siemens.com/sitop-redundancy/mail>

## Technical specifications

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
<b>Input</b>			
Input	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in rated}$	100 ... 240 V	100 ... 240 V	100 ... 240 V
Voltage range AC input voltage	85 ... 264 V	85 ... 264 V	85 ... 264 V
• at DC	110 ... 300 V	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes	Yes
Overvoltage resistance	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s
Mains buffering	at $V_{in} = 187 V$	at $V_{in} = 187 V$	at $V_{in} = 187 V$
Mains buffering at $I_{out rated, min.}$	40 ms; at $V_{in} = 187 V$	40 ms; at $V_{in} = 187 V$	40 ms; at $V_{in} = 187 V$
Rated line frequency 1	50 Hz	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz	60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
input current			
• at rated input voltage 120 V	0.3 A	0.53 A	1.13 A
• at rated input voltage 230 V	0.2 A	0.3 A	0.61 A
Switch-on current limiting (+25 °C), max.	20 A	25 A	50 A
$I^2t$ , max.	0.8 A <sup>2</sup> ·s	0.8 A <sup>2</sup> ·s	3 A <sup>2</sup> ·s
Built-in incoming fuse	internal	internal	internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C

# LOGO! logic modules

## LOGO!Power

### 1-phase, 12 V DC

#### Technical specifications

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
<b>Output</b>			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	12 V	12 V	12 V
<ul style="list-style-type: none"> <li>output voltage at output 1 at DC rated value</li> </ul>	12 V	12 V	12 V
Total tolerance, static $\pm$	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %	0.1 %
Residual ripple peak-peak, max.	200 mV	200 mV	200 mV
Residual ripple peak-peak, typ.	30 mV	30 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	50 mV	50 mV	50 mV
Adjustment range		10.5 ... 16.1 V	10.5 ... 16.1 V
product function output voltage adjustable	No	Yes	Yes
Output voltage setting		via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	0.5 s	0.5 s	0.5 s
Voltage rise, typ.	100 ms	100 ms	100 ms
Rated current value $I_{out rated}$	0.9 A	1.9 A	4.5 A
Current range	0 ... 0.9 A	0 ... 1.9 A	0 ... 4.5 A
<ul style="list-style-type: none"> <li>Note</li> </ul>	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
supplied active power typical	10.8 W	22.8 W	54 W
Parallel switching for enhanced performance	No	Yes	Yes
Numbers of parallel switchable units for enhanced performance		2	2
<b>Efficiency</b>			
Efficiency at $V_{out rated}$ , $I_{out rated}$ , approx.	78 %	81 %	87.1 %
Power loss at $V_{out rated}$ , $I_{out rated}$ , approx.	3 W	5 W	8 W
power loss [W] during no-load operation maximum	0.3 W	0.3 W	0.3 W
<b>Closed-loop control</b>			
Dynamic mains compensation ( $V_{in rated} \pm 15 \%$ ), max.	0.2 %	0.2 %	0.2 %
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %), $U_{out} \pm$ typ.	3 %	2 %	4 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms	1 ms
<b>Protection and monitoring</b>			
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	1.3 A	2.5 A	5 A
property of the output short-circuit proof	Yes	Yes	Yes
Short-circuit protection enduring short circuit current RMS value	Constant current characteristic	Constant current characteristic	Constant current characteristic
<ul style="list-style-type: none"> <li>maximum</li> </ul>	1.3 A	2.5 A	5 A
overcurrent overload capability in normal operation	overload capability 150% $I_{out rated}$ typ. 200 ms	overload capability 150% $I_{out rated}$ typ. 200 ms	overload capability 150% $I_{out rated}$ typ. 200 ms
Overload/short-circuit indicator	-	-	-
measuring point for output current		50 mV $\hat{=}$ 1.9 A	50 mV $\hat{=}$ 4.5 A
overcurrent overload capability when switching on	150% $I_{out rated}$ typ. 200 ms	150% $I_{out rated}$ typ. 200 ms	150% $I_{out rated}$ typ. 200 ms

**Technical specifications**

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
<b>Safety</b>			
Primary/secondary isolation	Yes	Yes	Yes
galvanic isolation	Safety extra-low output voltage $U_{o, out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{o, out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{o, out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
Degree of protection (EN 60529)	IP20	IP20	IP20
<b>Approvals</b>			
CE mark	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866
certificate of suitability NEC Class 2	Yes	Yes	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes	Yes
certificate of suitability EAC approval	Yes	Yes	Yes
Marine approval	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS
<b>EMC</b>			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
<b>environmental conditions</b>			
ambient temperature			
• during operation	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
- Note	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>			
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals
Connections			
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-	-
width of the enclosure	18 mm	36 mm	54 mm
height of the enclosure	90 mm	90 mm	90 mm
depth of the enclosure	53 mm	53 mm	53 mm
required spacing			
• top	20 mm	20 mm	20 mm
• bottom	20 mm	20 mm	20 mm
• left	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm
Weight, approx.	0.07 kg	0.12 kg	0.2 kg
product feature of the enclosure housing can be lined up	Yes	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
MTBF at 40 °C	3 793 080 h	2 938 542 h	2 566 680 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

**LOGO! logic modules**

## LOGO!Power

**1-phase, 15 V DC****Overview**

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Thanks to its stepped profile design, the LOGO!Power product line is ideally suited for installation in small distribution boards. The stabilized power supplies with a wide-range input are available with an output voltage of 15 V in two performance classes.

**Product highlights**

- Single-phase, 15 V DC/ 1.9 A and 4.0 A
- Wide-range input, input voltage 100 ... 240 V AC (85 ... 264 V), 110 ... 300 V DC
- Narrow unit with 36 mm or 54 mm width and overall depth of 53 mm in LOGO! design
- Up to 88.4% efficiency
- Integrated current monitor: Actual output current measurement directly at the power supply unit
- cULus, cURus, NEC class 2, ABS, BV, DNV GL, LRS certifications

**Ordering data****Article No.****LOGO!Power 1-phase, 15 V DC/1.9 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
(110 ... 300 V DC)  
Output: 15 V DC/1.9 A

**6EP3321-6SB10-0AY0****LOGO!Power 1-phase, 15 V DC/4 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
(110 ... 300 V DC)  
Output: 15 V DC/4 A

**6EP3322-6SB10-0AY0****Add-on modules****SITOP redundancy modules RED1200**

For more information, visit:  
<https://www.siemens.com/sitop-redundancy/mall>

**Technical specifications**

Article number	<b>6EP3321-6SB10-0AY0</b>	<b>6EP3322-6SB10-0AY0</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
<b>Input</b>		
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in rated}$	100 ... 240 V	100 ... 240 V
Voltage range AC input voltage	85 ... 264 V	85 ... 264 V
• at DC	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes
Overvoltage resistance	300 V AC for 1 s	300 V AC for 1 s
Mains buffering	at $V_{in} = 187$ V	at $V_{in} = 187$ V
Mains buffering at $I_{out rated, min.}$	40 ms; at $V_{in} = 187$ V	40 ms; at $V_{in} = 187$ V
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range input current	47 ... 63 Hz	47 ... 63 Hz
• at rated input voltage 120 V	0.63 A	1.24 A
• at rated input voltage 230 V	0.33 A	0.68 A
Switch-on current limiting (+25 °C), max.	25 A	55 A
$I^2t$ , max.	0.8 A <sup>2</sup> ·s	3 A <sup>2</sup> ·s
Built-in incoming fuse	internal	internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C

**Technical specifications**

Article number	<b>6EP3321-6SB10-0AY0</b>	<b>6EP3322-6SB10-0AY0</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
<b>Output</b>		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	15 V	15 V
<ul style="list-style-type: none"> <li>output voltage at output 1 at DC rated value</li> </ul>	15 V	15 V
Total tolerance, static $\pm$	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	200 mV	200 mV
Residual ripple peak-peak, typ.	30 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	50 mV	50 mV
Adjustment range	10.5 ... 16.1 V	10.5 ... 16.1 V
product function output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	0.5 s	0.5 s
Voltage rise, typ.	100 ms	100 ms
Rated current value $I_{out\ rated}$	1.9 A	4 A
Current range	0 ... 1.9 A	0 ... 4 A
<ul style="list-style-type: none"> <li>Note</li> </ul>	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
supplied active power typical	28.5 W	60 W
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
<b>Efficiency</b>		
Efficiency at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	83 %	88.4 %
Power loss at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	6 W	8 W
power loss [W] during no-load operation maximum	0.3 W	0.3 W
<b>Closed-loop control</b>		
Dynamic mains compensation ( $V_{in\ rated} \pm 15\%$ ), max.	0.2 %	0.2 %
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %), $U_{out} \pm$ typ.	2 %	3 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms
<b>Protection and monitoring</b>		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	2.5 A	5 A
property of the output short-circuit proof	Yes	Yes
Short-circuit protection enduring short circuit current RMS value	Constant current characteristic	Constant current characteristic
<ul style="list-style-type: none"> <li>maximum</li> </ul>	2.5 A	5 A
overcurrent overload capability in normal operation	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms
Overload/short-circuit indicator	-	-
measuring point for output current	50 mV $\hat{=}$ 1.9 A	45 mV $\hat{=}$ 4 A
overcurrent overload capability when switching on	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms

# LOGO! logic modules

## LOGO!Power

### 1-phase, 15 V DC

#### Technical specifications

Article number	<b>6EP3321-6SB10-0AY0</b>	<b>6EP3322-6SB10-0AY0</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
<b>Safety</b>		
Primary/secondary isolation galvanic isolation	Yes	Yes
Protection class	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Degree of protection (EN 60529)	Class II (without protective conductor) IP20	Class II (without protective conductor) IP20
<b>Approvals</b>		
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866
certificate of suitability NEC Class 2	Yes	Yes
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
certificate of suitability EAC approval	Yes	Yes
Marine approval	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>environmental conditions</b>		
ambient temperature		
• during operation	-25 ... +70 °C	-25 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>		
Connection technology	screw-type terminals	screw-type terminals
Connections		
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-
width of the enclosure	36 mm	54 mm
height of the enclosure	90 mm	90 mm
depth of the enclosure	53 mm	53 mm
required spacing		
• top	20 mm	20 mm
• bottom	20 mm	20 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.12 kg	0.2 kg
product feature of the enclosure housing can be lined up	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
MTBF at 40 °C	2 938 542 h	2 566 680 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)



**Overview**


Thanks to its stepped profile design, the LOGO!Power product line is ideally suited for installation in small distribution boards. The stabilized power supplies with wide-range input are available with an output voltage of 24 V in four performance classes. The 24 V versions are ideal for supplying LOGO! PLCs with the corresponding voltage input.

To further increase the 24 V availability, the LOGO!Power power supplies can be combined with **DC UPS, redundancy** and **selectivity modules**.

**Product highlights**

- Single-phase, 24 V DC/ 0.6 A, 1.3 A, 2.5 A and 4.0 A
- Input voltage 100 ... 240 V AC (85 ... 264 V), 110 ... 300 V DC
- Narrow unit with width of 18 mm, 36 mm, 54 mm or 72 mm and overall depth of 53 mm in LOGO! design
- Up to 90% efficiency
- Integrated current monitor: Actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- cULus, cURus, NEC class 2, ABS, BV, DNV GL, LRS certifications

**Ordering data**
**Article No.**
**LOGO!Power 1-phase, 24 V DC/0.6 A**

Stabilized power supply  
 Input: 100 ... 240 V AC  
 (110 ... 300 V DC)  
 Output: 24 V DC/0.6 A

**6EP3330-6SB00-0AY0**
**LOGO!Power 1-phase, 24 V DC/1.3 A**

Stabilized power supply  
 Input: 100 ... 240 V AC  
 (110 ... 300 V DC)  
 Output: 24 V DC/1.3 A

**6EP3331-6SB00-0AY0**
**LOGO!Power 1-phase, 24 V DC/2.5 A**

Stabilized power supply  
 Input: 100 ... 240 V AC  
 (110 ... 300 V DC)  
 Output: 24 V DC/2.5 A

**6EP3332-6SB00-0AY0**
**LOGO!Power 1-phase, 24 V DC/4 A**

Stabilized power supply  
 Input: 100 ... 240 V AC  
 (110 ... 300 V DC)  
 Output: 24 V DC/4 A

**6EP3333-6SB00-0AY0**
**Add-on modules**
**SITOP redundancy modules**

For more information, visit:  
<https://www.siemens.com/sitop-redundancy/mail>

**SITOP selectivity modules**

For more information, visit:  
<https://www.siemens.com/sitop-selectivity/mail>

**SITOP buffer module BUF1200**

For more information, visit:  
<https://www.siemens.com/sitop-buffering/mail>

**DC UPS modules**
**SITOP DC UPS**

For more information, visit:  
<https://www.siemens.com/sitop-ups/mail>

# LOGO! logic modules

## LOGO!Power

### 1-phase, 24 V DC

#### Technical specifications

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A
<b>Input</b>				
Input	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in rated}$	100 ... 240 V	100 ... 240 V	100 ... 240 V	100 ... 240 V
Voltage range AC input voltage	85 ... 264 V	85 ... 264 V	85 ... 264 V	85 ... 264 V
• at DC	110 ... 300 V	110 ... 300 V	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes	Yes	Yes
Overvoltage resistance	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s
Mains buffering	at $V_{in} = 187$ V	at $V_{in} = 187$ V	at $V_{in} = 187$ V	at $V_{in} = 187$ V
Mains buffering at $I_{out rated, min.}$	40 ms; at $V_{in} = 187$ V	40 ms; at $V_{in} = 187$ V	40 ms; at $V_{in} = 187$ V	40 ms; at $V_{in} = 187$ V
Rated line frequency 1	50 Hz	50 Hz	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz	60 Hz	60 Hz
Rated line range input current	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
• at rated input voltage 120 V	0.3 A	0.7 A	1.22 A	1.95 A
• at rated input voltage 230 V	0.2 A	0.35 A	0.66 A	0.97 A
Switch-on current limiting (+25 °C), max.	20 A	25 A	52 A	31 A
$I^2t$ , max.	0.8 A <sup>2</sup> ·s	0.8 A <sup>2</sup> ·s	3 A <sup>2</sup> ·s	2.5 A <sup>2</sup> ·s
Built-in incoming fuse	internal	internal	internal	internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C
<b>Output</b>				
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out DC}$	24 V	24 V	24 V	24 V
• output voltage at output 1 at DC rated value	24 V	24 V	24 V	24 V
Total tolerance, static ±	3 %	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %	0.1 %	0.1 %
Residual ripple peak-peak, max.	200 mV	200 mV	200 mV	200 mV
Residual ripple peak-peak, typ.	30 mV	30 mV	30 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	50 mV	50 mV	50 mV	50 mV
Adjustment range		22.2 ... 26.4 V	22.2 ... 26.4 V	22.2 ... 26.4 V
product function output voltage adjustable	No	Yes	Yes	Yes
Output voltage setting		via potentiometer	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	0.5 s	0.5 s	0.5 s	0.5 s
Voltage rise, typ.	100 ms	100 ms	100 ms	100 ms
Rated current value $I_{out rated}$	0.6 A	1.3 A	2.5 A	4 A
Current range	0 ... 0.6 A	0 ... 1.3 A	0 ... 2.5 A	0 ... 4 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
supplied active power typical	14.4 W	31.2 W	60 W	96 W
Parallel switching for enhanced performance	No	Yes	Yes	Yes
Numbers of parallel switchable units for enhanced performance		2	2	2

**Technical specifications**

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A
<b>Efficiency</b>				
Efficiency at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	81 %	86 %	90 %	89 %
Power loss at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	3 W	5 W	7 W	12 W
power loss [W] during no-load operation maximum	0.3 W	0.3 W	0.3 W	0.3 W
<b>Closed-loop control</b>				
Dynamic mains compensation ( $V_{in\ rated} \pm 15\%$ ), max.	0.2 %	0.2 %	0.2 %	0.2 %
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %), $U_{out} \pm$ typ.	2 %	1 %	2 %	2 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms	1 ms	1 ms
<b>Protection and monitoring</b>				
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	0.8 A	1.7 A	3.2 A	5 A
property of the output short-circuit proof	Yes	Yes	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic	Constant current characteristic	Constant current characteristic
enduring short circuit current RMS value				
• maximum	0.8 A	1.7 A	3.2 A	5 A
overcurrent overload capability in normal operation	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms
Overload/short-circuit indicator	-	-	-	-
measuring point for output current		50 mV = ^ 1.3 A	50 mV = ^ 2.5 A	50 mV = ^ 4 A
overcurrent overload capability when switching on	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms
<b>Safety</b>				
Primary/secondary isolation galvanic isolation	Yes	Yes	Yes	Yes
Protection class	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Degree of protection (EN 60529)	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
	IP20	IP20	IP20	IP20
<b>Approvals</b>				
CE mark	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866
certificate of suitability NEC Class 2	Yes	Yes	Yes	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes	Yes	Yes
certificate of suitability EAC approval	Yes	Yes	Yes	Yes
Marine approval	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS
<b>EMC</b>				
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable	not applicable	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2

# LOGO! logic modules

## LOGO!Power

### 1-phase, 24 V DC

#### Technical specifications

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A
<b>environmental conditions</b>				
ambient temperature				
• during operation	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
- Note	with natural convection	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>				
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals
Connections				
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-	-	-
width of the enclosure	18 mm	36 mm	54 mm	72 mm
height of the enclosure	90 mm	90 mm	90 mm	90 mm
depth of the enclosure	53 mm	53 mm	53 mm	53 mm
required spacing				
• top	20 mm	20 mm	20 mm	20 mm
• bottom	20 mm	20 mm	20 mm	20 mm
• left	0 mm	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm	0 mm
Weight, approx.	0.07 kg	0.12 kg	0.2 kg	0.29 kg
product feature of the enclosure housing can be lined up	Yes	Yes	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
MTBF at 40 °C	4 415 040 h	3 094 996 h	2 864 520 h	2 391 480 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

## Overview



Thanks to its stepped profile design, the SIPLUS LOGO!Power product family is ideally suited for low installation depths, such as in miniature distribution boards. The stabilized power supplies with a wide range input of 100 ... 240 V AC (85 ... 264 V) and 110 ... 300 V DC are available with an output voltage of 24 V in four performance classes. The 24 V versions are ideal for supplying SIPLUS LOGO! controllers with the corresponding voltage input. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to integrated current monitor (for devices at least 36 mm wide). The extended temperature range enables a host of additional applications.

### Main product highlights

- 24 V DC / 0.6 A, 1.3 A, 2.5 A and 4.0 A
- Narrow unit with width of 18 mm, 36 mm, 54 mm or 72 mm and overall depth of 53 mm in LOGO! design
- Flexible mounting: top hat DIN rail or wall mounting in a range of installation positions
- Higher energy efficiency: up to 90% efficiency over the entire load range as well as no-load power losses of < 0.3 W
- Integrated current monitor: Actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- Global use: International certifications such as UL, CSA, FM or ATEX

## Ordering data

## Article No.

**SIPLUS LOGO!Power 24 V 1.3 A**  
 Extended temperature range and exposure to media

Input 100 ... 240 V AC  
 Output 24 V DC, 1.3 A

**6AG1331-6SB00-7AY0**

**SIPLUS LOGO!Power 24 V 2.5 A**  
 Extended temperature range and exposure to media

Input 100 ... 240 V AC  
 Output 24 V DC, 2.5 A

**6AG1332-6SB00-7AY0**

**SIPLUS LOGO!Power 24 V 4 A**  
 Extended temperature range and exposure to media

Input 100 ... 240 V AC  
 Output 24 V DC, 4 A

**6AG1333-6SB00-7AY0**

# LOGO! logic modules

## SIPLUS LOGO!Power

### SIPLUS LOGO!Power

#### Technical specifications

Article number	6AG1331-6SB00-7AY0	6AG1332-6SB00-7AY0	6AG1333-6SB00-7AY0
Based on	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0
Product	SIPLUS LOGO!Power	SIPLUS LOGO!Power	SIPLUS LOGO!Power
Power supply, type	24 V/1.3 A	24 V/2.5 A	24 V/4 A
<b>environmental conditions</b>			
ambient temperature in horizontal mounting position during operation minimum	-40; Startup @ -25 °C ... +70; with natural convection	-40; Startup @ -25 °C ... +70; with natural convection	-40; Startup @ -25 °C ... +70; with natural convection
ambient temperature in horizontal mounting position during operation maximum			
ambient temperature during storage and transport	-40 ... +85	-40 ... +85	-40 ... +85
installation altitude at height above sea level maximum	6 000 m	6 000 m	6 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m
relative humidity with condensation acc. to IEC 60068-2-38 maximum	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
resistance to biologically active substances conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request
resistance to chemically active substances conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)
resistance to mechanically active substances conformity acc. to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust
resistance to biologically active substances conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)
resistance to chemically active substances conformity acc. to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)
resistance to mechanically active substances conformity acc. to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust
coating for equipped printed circuit board acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
type of test of the coating acc. to MIL-I-46058C	Yes; Discoloration of the coating during service life possible	Yes; Discoloration of the coating during service life possible	Yes; Discoloration of the coating during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	Yes; Conformal Coating, Class A	Yes; Conformal Coating, Class A	Yes; Conformal Coating, Class A

## Overview



- The user-friendly software for generating switching programs on the PC for single-user mode and network mode
- Generation of switching programs in a function block diagram (FBD) or ladder logic (LAD)
- Furthermore, testing, simulation, online testing and archiving of the switching programs
- Professional documentation with the help of various comment and print functions

### **Minimum system requirements**

Windows XP (32-bit), 7 (32/64-bit) or 8 (32/64-bit)

- PC Pentium IV.
- 150 MB free disk capacity.
- 256 MB RAM.
- SVGA graphics card with minimum resolution 800 x 600 (256 colors).
- DVD-ROM

### Mac OS X

- Mac OS X 10.4

### Linux

- Tested with SUSE Linux 11.3 SP2, kernel 3.0.76
- Runs on all Linux distributions on which Java 2 runs.
- Please refer to your relevant Linux distribution for the necessary hardware requirements.

## Ordering data

### **LOGO!Soft Comfort V8**

for programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD

## Article No.

**6ED1058-0BA08-0YA1**

## LOGO! logic modules

### LOGO! Starter Kits

#### LOGO! Starter Kits

##### Overview



There are now six LOGO! 8 Starter Kits for price-conscious beginners – each individually configured for the specific requirements.

- LOGO! Starter Kit 12/24RCE;  
With LOGO! 12/24RCE, power supply, screwdriver, in Systainer
- LOGO! Starter Kit 130 RCE;  
With LOGO! 230RCE, power supply, screwdriver, in Systainer
- LOGO! Starter Kit 12/24 V;  
With LOGO! 12/24RCEO, LOGO! TD, power supply, screwdriver, in Systainer
- LOGO! 8 KP300 Basic Starter Kit;  
With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN
- LOGO! 8 KTP400 Basic Starter Kit;  
With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic
- LOGO! 8 KTP700 Basic Starter Kit;  
With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic

With these low-cost complete packages, users can familiarize themselves quickly and easily with the advantages and possibilities of the logic module. LOGO! has been used successfully for many years in industry and trade throughout the world. It solves switching and control tasks conveniently and cost-effectively.

##### Ordering data

##### Article No.

###### LOGO! Starter Kits

In TANOS Box,  
with LOGO! Soft Comfort V8,  
WinCC Basic, Ethernet cable

###### LOGO! Starter Kit 12/24RCE

6ED1057-3BA01-0AA8

With LOGO! 12/24RCE,  
power supply, screwdriver,  
in Systainer

###### LOGO! Starter Kit 130 RCE

6ED1057-3BA03-0AA8

With LOGO! 230RCE,  
power supply, screwdriver,  
in Systainer

###### LOGO! Starter Kit 12/24 V

6ED1057-3BA11-0AA8

With LOGO! 12/24RCEO,  
LOGO! TD, power supply,  
screwdriver, in Systainer

###### LOGO! 8 KP300 Basic Starter Kit

6AV2132-0HA00-0AA1

With LOGO! 12/24RCE,  
LOGO! Power 24 V 1.3 A,  
KP300 Basic mono PN

###### LOGO! 8 KTP400 Basic Starter Kit

6AV2132-0KA00-0AA1

With LOGO! 12/24RCE,  
LOGO! Power 24 V 1.3 A,  
KTP400 Basic

###### LOGO! 8 KTP700 Basic Starter Kit

6AV2132-3GB00-0AA1

With LOGO! 12/24RCE,  
LOGO! Power 24 V 1.3 A,  
KTP700 Basic



**Overview**


- Switching module for the direct switching of resistive loads and motors

**Ordering data**
**LOGO!Contact**

Switching module for direct switching of resistive loads up to 20 A and motors up to 4 kW

Switching voltage 24 V

Switching voltage 230 V

**Article No.**

**6ED1057-4CA00-0AA0**

**6ED1057-4EA00-0AA0**

**2**
**Technical specifications**

Article number	<b>6ED1057-4CA00-0AA0</b>	<b>6ED1057-4EA00-0AA0</b>
	LOGO! Contact Mod., DC 24V, 3NO/1NC	LOGO! Contact Mod., AC 230V,3NO/1NC
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
<b>Dimensions</b>		
Width	36 mm	36 mm
Height	72 mm	72 mm
Depth	55 mm	55 mm
<b>Weights</b>		
Weight, approx.	160 g	160 g

**LOGO! logic modules**

LOGO! Accessories

**LOGO! mounting kits****Overview**

LOGO! and SIPLUS LOGO! are designed for quick and easy mounting on top hat DIN rails. With the mounting kit, these devices can also be easily and safely installed in front panels. If the supplied washer and seals are used, the devices are reliably protected against harsh environmental conditions up to the IP65 degree of protection.

**Ordering data****Article No.****Front panel mounting kit**

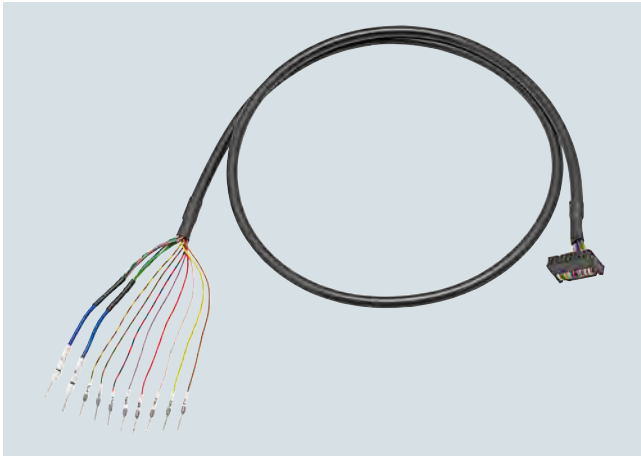
Width 4 MW, with keys

**6AG1057-1AA00-0AA3**

Width 8 MW, with keys

**6AG1057-1AA00-0AA2**

## Overview



SIMATIC TOP connect universal connecting cable

The wiring of the

- SIMATIC S7-1500 IO (25 mm)
- SIMATIC ET 200SP
- SIMATIC S7-1200
- LOGO!

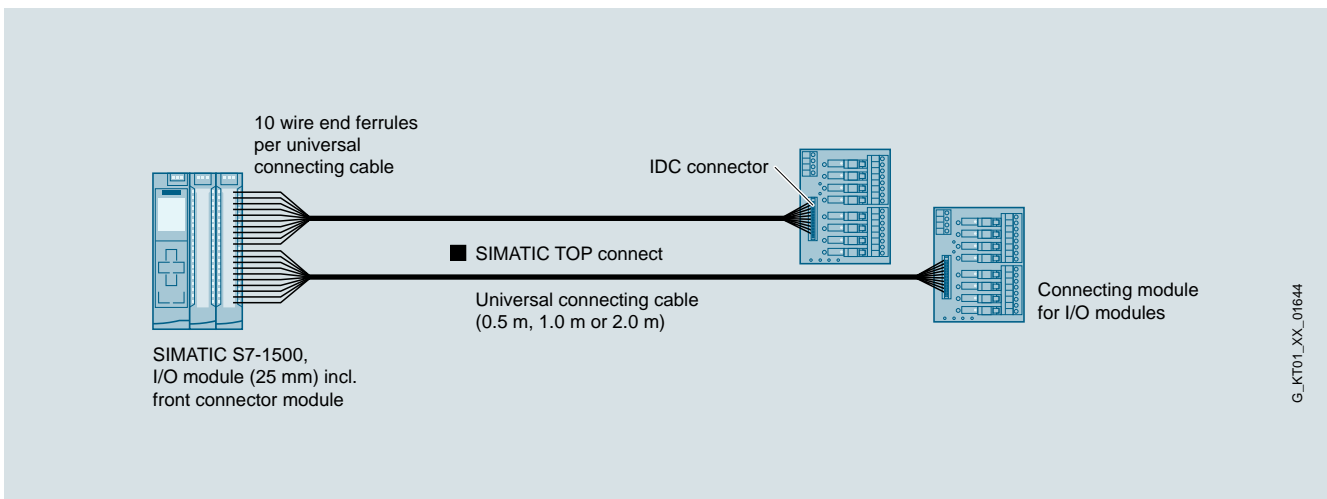
with the sensors/actuators is a significant factor with respect to time/cost overhead during configuration, control cabinet design, procurement and ease of servicing. The SIMATIC TOP connect system cabling makes connection easy, fast and secure.

## Design

The unshielded universal connecting cable is offered for a wide range of control cabinet concepts.

It comprises:

- 16-pin round cable with a core diameter of 0.14 mm<sup>2</sup>, pre-assembled with wire end ferrules for connection to the controller:
  - labeled with "0" ... "7" for the control inputs/outputs
  - labeled with "M" for mass
  - labeled with "L+" for 24 V DC potential
- 16-pin ID (insulation displacement) connector for connection to the SIMATIC TOP connect terminal modules for 8 I/Os:
  - 3-wire connection using the appropriate terminal module for quick, error-free wiring
  - Galvanic isolation and adaptation using a coupling relay for easy implementation of potential groups in the system
  - High output current (up to 4 A), even for higher switching frequencies, using an optocoupler module (overload and short-circuit proof)
  - Implementation of isolating terminals using switch modules enabling individual signals to be measured
  - Channel-wise protection of I/Os using a fuse module with a thermal fuse



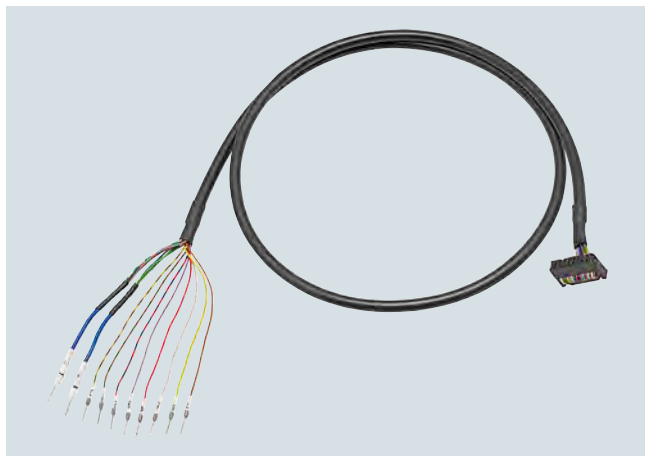
SIMATIC TOP connect universal connecting cable

## LOGO! logic modules

### LOGO! Accessories

#### System cabling for SIMATIC S7-1500 IO (25 mm), ET 200SP, S7-1200 and LOGO!

##### Overview Universal connecting cable



SIMATIC TOP connect universal connecting cable

The universal connecting cable constitutes the link between the standard connection of the SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 or LOGO! and the SIMATIC TOP connect terminal module. It transmits 8 signals and the supply voltage. The connecting cable is available in lengths of 0.5 m / 1.0 m / 2.0 m. the maximum technically feasible length is 30 m.

##### Ordering data

##### Article No.

**Universal connecting cable for SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 and LOGO!**

**16 x 0.14 mm<sup>2</sup> unshielded**

- 0.5 m
- 1.0 m
- 2.0 m

**6ES7923-0BA50-0FB0**  
**6ES7923-0BB00-0FB0**  
**6ES7923-0BC00-0FB0**

##### Overview Terminal modules

The terminal modules are used instead of conventional terminal blocks and act as the interface between the controller and signals from the field. All digital modules with 8 I/Os can be used.

##### Ordering data

##### Article No.

##### Terminal module TP1

For 1-wire connection, for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0AA20-0AC0**  
**6ES7924-0AA20-0AA0**  
**6ES7924-0AA20-0BC0**  
**6ES7924-0AA20-0BA0**

##### Terminal module TP3

For 3-wire connection, for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs
- Push-in terminals with LEDs and one isolating terminal per channel
- Screw-type terminals with LEDs and one isolating terminal per channel
- Push-in terminals with LEDs and fuse per channel
- Screw-type terminals with LEDs and fuse per channel

**6ES7924-0CA20-0AC0**  
**6ES7924-0CA20-0AA0**  
**6ES7924-0CA20-0BC0**  
**6ES7924-0CA20-0BA0**  
**6ES7924-0CH20-0BC0**  
**6ES7924-0CH20-0BA0**  
**6ES7924-0CL20-0BC0**  
**6ES7924-0CL20-0BA0**

##### Terminal module TPRo

Relay module for 8 outputs, relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0BD20-0BC0**  
**6ES7924-0BD20-0BA0**

##### Terminal module TPRI

Relay module for 8 inputs (1230 V AC), relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0BE20-0BC0**  
**6ES7924-0BE20-0BA0**

##### Terminal module TPRI

Relay module for 8 inputs (110 V AC), relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0BG20-0BC0**  
**6ES7924-0BG20-0BA0**

##### Terminal module TPOo

Optocoupler module for 8 outputs (max. 24 V DC/4 A)

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0BF20-0BC0**  
**6ES7924-0BF20-0BA0**

## SIMATIC S7-1200 Basic Controllers



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## SIMATIC S7-1200 Basic Controllers

### Introduction

#### S7-1200

#### Overview



- Compact controllers for the low to mid-performance ranges
- Large-scale integration, space-saving, powerful
- With exceptional real-time performance and powerful communication options:
  - Controller with integrated PROFINET IO controller interface for communication between SIMATIC controllers, HMI, programming device or other automation components
- All CPUs can be used in stand-alone mode, in networks and within distributed structures
- Extremely simple installation, programming and operation
- Integrated web server with standard and user-specific web pages
- Data logging functionality for archiving of data at runtime from the user program
- Powerful, integrated technology functions such as counting, measuring, closed-loop control, and Motion Control
- Integrated digital and analog inputs/outputs
- Flexible expansion facilities
  - Signal boards for direct use in a controller
  - Signal modules for expansion of controllers with input/output channels; including an Energy Meter module for recording and preparing energy data
  - Accessories, e.g. power supply, switch module or SIMATIC memory card

### Technical specifications

General technical specifications SIMATIC S7-1200	
Degree of protection	IP20 acc. to IEC 529
Ambient temperature	
• Operation (95% humidity)	
- Horizontal installation	-20 ... +60 °C
- Vertical installation	-20 ... +50 °C
• Transportation and storage	
- With 95% humidity	25 ... 55 °C
Insulation	
• 5/24 V DC circuits	500 V AC test voltage
• 115/230 V AC circuits to ground	1500 V AC test voltage
• 115/230 V AC circuits to 115/230 V AC circuits	1500 V AC test voltage
• 230 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
• 115 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
Electromagnetic compatibility	Requirements of the EMC directive
• Noise immunity acc. to EN 50082-2	Test acc. to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160
• Emitted interference acc. to EN 50081-1 and EN 50081-2	Test according to EN 55011, Class A, Group 1
Mechanical strength	
• Vibrations, test acc. to / tested with	IEC 68, Part 2-6: 10 ... 57 Hz; constant amplitude 0.3 mm; 58 ... 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in switchboard); mode of vibration: frequency sweeps with a sweep rate of 1 octave/minute; duration of vibration: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes
• Shocks, test acc. to / tested with	IEC 68, Part 2-27/half-sine: magnitude of shock 15 g (peak value), duration 11 ms, 6 shocks in each of the three mutually perpendicular axes

General technical data of SIPLUS S7-1200	
Ambient temperature range	-40/-25/-20 ... +55/+60/+70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions.
<b>Ambient conditions</b>	
Extended range of environmental conditions	
• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0° C
Relative humidity	
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

# SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

## CPU 1211C

### Overview



- Controller for intro to S7
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - Max. 3 communications modules (CM)

### Ordering data

#### CPU 1211C

**Compact CPU, AC/DC/relay;**  
Integrated program/data memory  
50 KB, load memory 1 MB;  
Wide-range power supply  
85 ... 264 V AC;  
Boolean execution times 0.1  $\mu$ s  
per operation;  
6 digital inputs,  
4 digital outputs (relays),  
2 analog inputs;  
Expandable by up to  
3 communications modules and  
1 signal board/communication  
board;  
Digital inputs can be used as HSC  
at 100 kHz

#### Article No.

6ES7211-1BE40-0XB0

**Compact CPU, DC/DC/DC;**  
Integrated program/data memory  
50 KB, load memory 1 MB;  
Supply voltage 24 V DC;  
Boolean execution times 0.1  $\mu$ s  
per operation;  
6 digital inputs,  
4 digital outputs,  
2 analog inputs;  
Expandable by up to  
3 communications modules and  
1 signal board/communication  
board;  
Digital inputs can be used as HSC  
at 100 kHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO) or  
pulse-width modulated outputs  
(PWM) at 100 kHz

6ES7211-1AE40-0XB0

**Compact CPU, DC/DC/relay;**  
Integrated program/data memory  
50 KB, load memory 1 MB;  
Supply voltage 24 V DC;  
Boolean execution times 0.1  $\mu$ s  
per operation;  
6 digital inputs,  
4 digital outputs (relays),  
2 analog inputs;  
Expandable by up to  
3 communications modules and  
1 signal board/communication  
board;  
Digital inputs can be used as HSC  
at 100 kHz

6ES7211-1HE40-0XB0

#### Article No.

#### SB 1221 signal board

4 inputs, 5 V DC, 200 kHz  
4 inputs, 24 V DC, 200 kHz

6ES7221-3AD30-0XB0

6ES7221-3BD30-0XB0

#### SB 1222 signal board

4 outputs, 5 V DC, 0.1 A, 200 kHz  
4 outputs, 24 V DC, 0.1 A, 200 kHz

6ES7222-1AD30-0XB0

6ES7222-1BD30-0XB0

#### SB 1223 signal board

2 inputs, 24 V DC,  
IEC type 1 sinking input;  
2 x 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC at  
up to 30 kHz

6ES7223-0BD30-0XB0

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

6ES7223-3AD30-0XB0

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

6ES7223-3BD30-0XB0

#### SB 1231 signal board

1 analog input,  $\pm 10$  V with 12 bits or  
0 ... 20 mA with 11 bits

6ES7231-4HA30-0XB0

#### SB 1231 thermocouple signal board

1 input +/- 80 mV, resolution 15 bits  
+ sign, thermocouples type J, K

6ES7231-5QA30-0XB0

#### SB 1231 RTD signal board

1 input for resistance temperature  
sensors Pt 100, Pt 200, Pt 500,  
Pt 1000, resolution 15 bits + sign

6ES7231-5PA30-0XB0

#### SB 1232 signal board

1 analog output,  $\pm 10$  V with 12 bits  
or 0 to 20 mA with 11 bits

6ES7232-4HA30-0XB0

#### CB 1241 RS485 communication board

For point-to-point connection,  
with 1 RS485 interface

6ES7241-1CH30-1XB0



Ordering data	Article No.	Ordering data	Article No.
<b>BB1297 battery board</b> For long-term backup of real-time clock, can be plugged into the signal board slot; battery (CR1025) is not included in scope of supply	6ES7297-0AX30-0XA0	<b>RJ45 cable grip</b> 4 units per pack Single port	6ES7290-3AA30-0XA0
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b> 8 input switches, for CPU 1211C / CPU 1212C	6ES7274-1XF30-0XA0	<b>Front flap set (spare part)</b> For CPU 1211C/1212C	6ES7291-1AA30-0XA0
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b> 2 potentiometers	6ES7274-1XA30-0XA0	<b>STEP 7 Professional / Basic V17</b> <b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC <b>Requirement:</b> Windows 10 (64-bit) • Windows 10 Home Version 1909, 2004, 20H2 (only STEP 7 Basic) • Windows 10 Professional Version 1909, 2004, 20H2 • Windows 10 Enterprise Version 1909, 2004, 20H2 • Windows 10 IoT Enterprise 2016 LTSB • Windows 10 IoT Enterprise 2019 LTSC Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) <b>Type of delivery:</b> 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download  STEP 7 Professional V17, floating license  STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>  Email address required for delivery  STEP 7 Basic V17, floating license  STEP 7 Basic V17, floating license, software download including license key <sup>1)</sup>  Email address required for delivery	
<b>SIMATIC Memory Card (optional)</b> 4 MB 12 MB 24 MB 256 MB 2 GB 32 GB	6ES7954-8LC03-0AA0 6ES7954-8LE03-0AA0 6ES7954-8LF03-0AA0 6ES7954-8LL03-0AA0 6ES7954-8LP03-0AA0 6ES7954-8LT03-0AA0		
<b>Terminal block (spare part)</b> For CPU 1211C AC/DC/relay • For DI, 14-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For DO, 8-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For AI, 3-pin, gold-plated; 4 units - Screw-type system - Push-in system  For CPU 1211C DC/DC/DC • For DI, 14-pin, tin-coated; 4 units - Screw-type system - Push-in system • For DO, 8-pin, tin-coated; 4 units - Screw-type system - Push-in system • For AI, 3-pin, gold-plated; 4 units - Screw-type system - Push-in system  For CPU 1211C DC/DC/relay • For DI, 14-pin, tin-coated; 4 units - Screw-type system - Push-in system • For DO, 8-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For AI, 3-pin, gold-plated; 4 units - Screw-type system - Push-in system	6ES7292-1AP40-0XA0 6ES7292-2AP40-0XA0  6ES7292-1AH40-0XA0 6ES7292-2AH40-0XA0  6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0  6ES7292-1AP30-0XA0 6ES7292-2AP30-0XA0  6ES7292-1AH30-0XA0 6ES7292-2AH30-0XA0  6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0  6ES7292-1AP30-0XA0 6ES7292-2AP30-0XA0  6ES7292-1AH40-0XA0 6ES7292-2AH40-0XA0  6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0		6ES7822-1AA07-0YA5  6ES7822-1AE07-0YA5  6ES7822-0AA07-0YA5 6ES7822-0AE07-0YA5

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

## CPU 1211C

### Technical specifications

Article number	<b>6ES7211-1HE40-0XB0</b> CPU 1211C, DC/DC/Relay, 6DI/4DO/2AI	<b>6ES7211-1BE40-0XB0</b> CPU 1211C, AC/DC/Relay, 6DI/4DO/2AI	<b>6ES7211-1AE40-0XB0</b> CPU 1211C, DC/DC/DC, 6DI/4DO/2AI
<b>General information</b>			
Product type designation	CPU 1211C DC/DC/relay	CPU 1211C AC/DC/relay	CPU 1211C DC/DC/DC
<b>Engineering with</b>			
• Programming package	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher
<b>Supply voltage</b>			
Rated value (DC)	Yes	Yes	Yes
• 24 V DC			
Rated value (AC)			
• 120 V AC	Yes	Yes	
• 230 V AC	Yes	Yes	
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V	L+ minus 4 V DC min.	20.4 to 28.8V	L+ minus 4 V DC min.
<b>Memory</b>			
<b>Work memory</b>			
• integrated	50 kbyte	50 kbyte	50 kbyte
<b>Load memory</b>			
• integrated	1 Mbyte with SIMATIC memory card	1 Mbyte with SIMATIC memory card	1 Mbyte with SIMATIC memory card
• Plug-in (SIMATIC Memory Card), max.			
<b>Backup</b>			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time)	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	6; Integrated	6; Integrated	6; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number of digital outputs	4; Relays	4; Relays	4
• of which high-speed outputs			4; 100 kHz Pulse Train Output
<b>Analog inputs</b>			
Number of analog inputs	2	2	2
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>Analog outputs</b>			
Number of analog outputs	0	0	0
<b>1. Interface</b>			
<b>Protocols</b>			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No

## Technical specifications

Article number	<b>6ES7211-1HE40-0XB0</b> CPU 1211C, DC/DC/Relay, 6DI/4DO/2AI	<b>6ES7211-1BE40-0XB0</b> CPU 1211C, AC/DC/Relay, 6DI/4DO/2AI	<b>6ES7211-1AE40-0XB0</b> CPU 1211C, DC/DC/DC, 6DI/4DO/2AI
<b>Protocols</b>			
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>OPC UA</b>			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; Data access (read, write, subscribe), runtime license required
<b>Communication functions</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>Integrated Functions</b>			
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	Up to 4 with SB 1222	4; With integrated outputs
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs			4
Limit frequency (pulse)			100 kHz
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
<b>Pollutant concentrations</b>			
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	380 g	420 g	370 g

## SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

### CPU 1212C

#### Overview



- Controller for intro to S7 with basic expansion options
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 2 signal modules (SM)
  - Max. 3 communications modules (CM)

#### Ordering data

##### CPU 1212C

**Compact CPU, AC/DC/relay;**  
Integrated program/data memory  
75 KB, load memory 2 MB;  
Wide-range power supply  
85 ... 264 V AC;  
Boolean execution times  
0.1 µs per operation;  
8 digital inputs,  
6 digital outputs (relays),  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
2 signal modules and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz

##### Article No.

6ES7212-1BE40-0XB0

**Compact CPU, DC/DC/DC;**  
Integrated program/data memory  
75 KB, load memory 2 MB;  
Supply voltage 24 V DC;  
Boolean execution times  
0.1 µs per operation;  
8 digital inputs,  
6 digital outputs,  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
2 signal modules, and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO) or  
pulse-width modulated outputs  
(PWM) at 100 kHz

6ES7212-1AE40-0XB0

**Compact CPU, DC/DC/relay;**  
Integrated program/data memory  
75 KB, load memory 2 MB;  
Supply voltage 24 V DC;  
Boolean execution times  
0.1 µs per operation;  
8 digital inputs,  
6 digital outputs (relays),  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
2 signal modules, and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz

6ES7212-1HE40-0XB0

##### Article No.

##### SB 1221 signal board

4 inputs, 5 V DC, 200 kHz  
4 inputs, 24 V DC, 200 kHz

6ES7221-3AD30-0XB0

6ES7221-3BD30-0XB0

##### SB 1222 signal board

4 outputs, 5 V DC, 0.1 A, 200 kHz  
4 outputs, 24 V DC, 0.1 A, 200 kHz

6ES7222-1AD30-0XB0

6ES7222-1BD30-0XB0

##### SB 1223 signal board

2 inputs, 24 V DC,  
IEC type 1 sinking input;  
2 x 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC at  
up to 30 kHz

6ES7223-0BD30-0XB0

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

6ES7223-3AD30-0XB0

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

6ES7223-3BD30-0XB0

##### SB 1231 signal board

1 analog input, ±10 V with 12 bits or  
0 ... 20 mA with 11 bits

6ES7231-4HA30-0XB0

##### SB 1231 thermocouple signal board

1 input +/- 80 mV, resolution 15 bits  
+ sign, thermocouples type J, K

6ES7231-5QA30-0XB0

##### SB 1231 RTD signal board

1 input for resistance temperature  
sensors Pt 100, Pt 200, Pt 500,  
Pt 1000, resolution 15 bits + sign

6ES7231-5PA30-0XB0

##### SB 1232 signal board

1 analog output, ±10 V with 12 bits  
or 0 to 20 mA with 11 bits

6ES7232-4HA30-0XB0

##### CB 1241 RS485 communication board

For point-to-point connection,  
with 1 RS485 interface

6ES7241-1CH30-1XB0

##### BB1297 battery board

For long-term backup of real-time  
clock, can be plugged into  
the signal board slot;  
battery (CR1025) is not included  
in scope of supply

6ES7297-0AX30-0XA0

Ordering data	Article No.	Article No.
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b> 8 input switches, for CPU 1211C / CPU 1212C	6ES7274-1XF30-0XA0	<b>Terminal block (spare part)</b> (continued) <ul style="list-style-type: none"> <li>For AI, 3-pin, gold-plated; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> </ul> For CPU 1212C DC/DC/DC <ul style="list-style-type: none"> <li>For DI, 14-pin, tin-coated; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> <li>For DO, 8-pin, tin-coated; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> <li>For AI, 3-pin, gold-plated; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> </ul> For CPU 1212C DC/DC/relay <ul style="list-style-type: none"> <li>For DI, 14-pin, tin-coated; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> <li>For DO, 8-pin, tin-coated, coded; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> <li>For AI, 3-pin, gold-plated; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> </ul>
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b> 2 potentiometers	6ES7274-1XA30-0XA0	
<b>SIMATIC Memory Card (optional)</b> 4 MB 12 MB 24 MB 256 MB 2 GB 32 GB	6ES7954-8LC03-0AA0 6ES7954-8LE03-0AA0 6ES7954-8LF03-0AA0 6ES7954-8LL03-0AA0 6ES7954-8LP03-0AA0 6ES7954-8LT03-0AA0	
<b>Extension cable for two-tier configuration</b> For connecting digital/analog signal modules; length 2 m	6ES7290-6AA30-0XA0	
<b>Starter Kit CPU 1212C AC/DC/relay</b> Complete offer SIMATIC S7-1200, starter box, comprising: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, info material, in Systainer	6ES7212-1BE34-4YB0	
<b>SIMATIC S7-1200 + KP300 Basic Starter Kit</b> Consisting of: CPU 1212C AC/DC/relay, HMI KP300 Basic mono PN, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer	6AV6651-7HA02-3AA4	
<b>SIMATIC S7-1200 + KTP400 Basic Starter Kit</b> Consisting of: CPU 1212C AC/DC/relay, HMI KTP400 Basic, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer	6AV6651-7KA02-3AA4	
<b>SIMATIC S7-1200 + KTP700 Basic Starter Kit</b> Consisting of: CPU 1212C AC/DC/relay, HMI KTP700 Basic, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer	6AV6651-7DA02-3AA4	
<b>Terminal block (spare part)</b> For CPU 1212C AC/DC/relay <ul style="list-style-type: none"> <li>For DI, 14-pin, tin-coated, coded; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> <li>For DO, 8-pin, tin-coated, coded; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> </ul>	6ES7292-1AP40-0XA0 6ES7292-2AP40-0XA0  6ES7292-1AH40-0XA0 6ES7292-2AH40-0XA0	
<b>RJ45 cable grip</b> 4 units per pack Single port	6ES7290-3AA30-0XA0	
<b>Front flap set (spare part)</b> For CPU 1211C/1212C	6ES7291-1AA30-0XA0	
<b>STEP 7 Professional / Basic 17</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) <ul style="list-style-type: none"> <li>Windows 10 Home Version 1909, 2004, 20H2 (only STEP 7 Basic)</li> <li>Windows 10 Professional Version 1909, 2004, 20H2</li> <li>Windows 10 Enterprise Version 1909, 2004, 20H2</li> <li>Windows 10 IoT Enterprise 2016 LTSC</li> <li>Windows 10 IoT Enterprise 2019 LTSC</li> </ul> Windows Server (64-bit) <ul style="list-style-type: none"> <li>Windows Server 2016 Standard (full installation)</li> <li>Windows Server 2019 Standard (full installation)</li> </ul> Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V17, floating license STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup> Email address required for delivery STEP 7 Basic V17, floating license STEP 7 Basic V17, floating license, software download including license key <sup>1)</sup> Email address required for delivery	6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0  6ES7292-1AP30-0XA0 6ES7292-2AP30-0XA0  6ES7292-1AH30-0XA0 6ES7292-2AH30-0XA0  6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0  6ES7292-1AP30-0XA0 6ES7292-2AP30-0XA0  6ES7292-1AH40-0XA0 6ES7292-2AH40-0XA0  6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0	
		6ES7822-1AA07-0YA5  6ES7822-1AE07-0YA5  6ES7822-0AA07-0YA5 6ES7822-0AE07-0YA5

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

## Technical specifications

Article number	<b>6ES7212-1AE40-0XB0</b> CPU 1212C ,DC/DC/DC, 8DI/6DO/2AI	<b>6ES7212-1BE40-0XB0</b> CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	<b>6ES7212-1HE40-0XB0</b> CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
<b>General information</b>			
Product type designation	CPU 1212C DC/DC/DC	CPU 1212C AC/DC/relay	CPU 1212C DC/DC/relay
<b>Engineering with</b>			
• Programming package	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher
<b>Supply voltage</b>			
Rated value (DC)	Yes	Yes	Yes
• 24 V DC			
Rated value (AC)			
• 120 V AC	Yes	Yes	
• 230 V AC	Yes	Yes	
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V	L+ minus 4 V DC min.	20.4 to 28.8V	L+ minus 4 V DC min.
<b>Memory</b>			
<b>Work memory</b>			
• integrated	75 kbyte	75 kbyte	75 kbyte
<b>Load memory</b>			
• integrated	2 Mbyte	2 Mbyte	2 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time)	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	8; Integrated	8; Integrated	8; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number of digital outputs	6	6; Relays	6; Relays
• of which high-speed outputs	4; 100 kHz Pulse Train Output		
<b>Analog inputs</b>			
Number of analog inputs	2	2	2
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>Analog outputs</b>			
Number of analog outputs	0	0	0
<b>1. Interface</b>			
<b>Protocols</b>			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No

**Technical specifications**

Article number	<b>6ES7212-1AE40-0XB0</b> CPU 1212C ,DC/DC/DC, 8DI/6DO/2AI	<b>6ES7212-1BE40-0XB0</b> CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	<b>6ES7212-1HE40-0XB0</b> CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
<b>Protocols</b>			
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>OPC UA</b>			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
<b>Communication functions</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>Integrated Functions</b>			
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	4; With integrated outputs	Up to 4 with SB 1222	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs	4		
Limit frequency (pulse)	100 kHz		
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical
<b>Pollutant concentrations</b>			
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	370 g	425 g	385 g

# SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

## CPU 1214C

### Overview



- Controller for intro to S7 with flexible expansion options
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

### Ordering data

#### CPU 1214C

**Compact CPU, AC/DC/relay;**  
Integrated program/data memory  
100 KB, load memory 2 MB;  
Wide-range power supply  
85 ... 264 V AC;  
Boolean execution times  
0.1  $\mu$ s per operation;  
14 digital inputs,  
10 digital outputs (relays),  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
8 signal modules and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz

#### Article No.

6ES7214-1BG40-0XB0

**Compact CPU, DC/DC/DC;**  
Integrated program/data memory  
100 KB, load memory 2 MB;  
Supply voltage 24 V DC;  
Boolean execution times  
0.1  $\mu$ s per operation;  
14 digital inputs,  
10 digital outputs,  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
8 signal modules, and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO)  
or pulse-width modulated outputs  
(PWM) at 100 kHz

6ES7214-1AG40-0XB0

**Compact CPU, DC/DC/relay;**  
Integrated program/data memory  
100 KB, load memory 2 MB;  
Supply voltage 24 V DC;  
Boolean execution times  
0.1  $\mu$ s per operation;  
14 digital inputs,  
10 digital outputs (relays),  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
8 signal modules, and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz

6ES7214-1HG40-0XB0

#### Article No.

#### SB 1221 signal board

4 inputs, 5 V DC, 200 kHz  
4 inputs, 24 V DC, 200 kHz

6ES7221-3AD30-0XB0

6ES7221-3BD30-0XB0

#### SB 1222 signal board

4 outputs, 5 V DC, 0.1 A, 200 kHz  
4 outputs, 24 V DC, 0.1 A, 200 kHz

6ES7222-1AD30-0XB0

6ES7222-1BD30-0XB0

#### SB 1223 signal board

2 inputs, 24 V DC,  
IEC type 1 sinking input;  
2 x 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC at  
up to 30 kHz

6ES7223-0BD30-0XB0

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

6ES7223-3AD30-0XB0

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

6ES7223-3BD30-0XB0

#### SB 1231 signal board

1 analog input,  $\pm 10$  V with 12 bits or  
0 ... 20 mA with 11 bits

6ES7231-4HA30-0XB0

#### SB 1231 thermocouple signal board

1 input +/- 80 mV, resolution 15 bits  
+ sign, thermocouples type J, K

6ES7231-5QA30-0XB0

#### SB 1231 RTD signal board

1 input for resistance temperature  
sensors Pt 100, Pt 200, Pt 500,  
Pt 1000, resolution 15 bits + sign

6ES7231-5PA30-0XB0

#### SB 1232 signal board

1 analog output,  $\pm 10$  V with 12 bits  
or 0 to 20 mA with 11 bits

6ES7232-4HA30-0XB0

#### CB 1241 RS485 communication board

For point-to-point connection,  
with 1 RS485 interface

6ES7241-1CH30-1XB0

#### BB1297 battery board

For long-term backup of real-time  
clock, can be plugged into the  
signal board slot;  
battery (CR1025) is not included in  
scope of supply

6ES7297-0AX30-0XA0



Ordering data	Article No.	Ordering data	Article No.
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b> 14 input switches, for CPU 1214C/1215C	6ES7274-1XH30-0XA0	<b>RJ45 cable grip</b> 4 units per pack Single port	6ES7290-3AA30-0XA0
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b> 2 potentiometers	6ES7274-1XA30-0XA0	<b>Front flap set (spare part)</b> For CPU 1214C	6ES7291-1AB30-0XA0
<b>SIMATIC Memory Card (optional)</b> 4 MB 12 MB 24 MB 256 MB 2 GB 32 GB	6ES7954-8LC03-0AA0 6ES7954-8LE03-0AA0 6ES7954-8LF03-0AA0 6ES7954-8LL03-0AA0 6ES7954-8LP03-0AA0 6ES7954-8LT03-0AA0	<b>STEP 7 Professional / Basic V17</b> <b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC <b>Requirement:</b> Windows 10 (64-bit) • Windows 10 Home Version 1909, 2004, 20H2 (only STEP 7 Basic) • Windows 10 Professional Version 1909, 2004, 20H2 • Windows 10 Enterprise Version 1909, 2004, 20H2 • Windows 10 IoT Enterprise 2016 LTSC • Windows 10 IoT Enterprise 2019 LTSC Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) <b>Type of delivery:</b> 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V17, floating license STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup> Email address required for delivery STEP 7 Basic V17, floating license STEP 7 Basic V17, floating license, software download including license key <sup>1)</sup> Email address required for delivery	6ES7822-1AA07-0YA5 6ES7822-1AE07-0YA5 6ES7822-0AA07-0YA5 6ES7822-0AE07-0YA5
<b>Extension cable for two-tier configuration</b> For connecting digital/analog signal modules; length 2 m	6ES7290-6AA30-0XA0		
<b>Terminal block (spare part)</b> For CPU 1214C AC/DC/relay • For DI, 20-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For DO, 12-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For AI, 3-pin, gold-plated; 4 units - Screw-type system - Push-in system For CPU 1214C DC/DC/DC • For DI, 20-pin, tin-coated; 4 units - Screw-type system - Push-in system • For DO, 12-pin, tin-coated; 4 units - Screw-type system - Push-in system • For AI, 3-pin, gold-plated; 4 units - Screw-type system - Push-in system For CPU 1214C DC/DC/relay • For DI, 20-pin, tin-coated; 4 units - Screw-type system - Push-in system • For DO, 12-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For AI, 3-pin, gold-plated; 4 units - Screw-type system - Push-in system	6ES7292-1AV40-0XA0 6ES7292-2AV40-0XA0 6ES7292-1AM40-0XA0 6ES7292-2AM40-0XA0 6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0 6ES7292-1AV30-0XA0 6ES7292-2AV30-0XA0 6ES7292-1AM30-0XA0 6ES7292-2AM30-0XA0 6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0 6ES7292-1AV30-0XA0 6ES7292-2AV30-0XA0 6ES7292-1AM40-0XA0 6ES7292-2AM40-0XA0 6ES7292-1BC30-0XA0 6ES7292-2BC30-0XA0		

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

## CPU 1214C

### Technical specifications

Article number	<b>6ES7214-1BG40-0XB0</b> CPU 1214C, AC/DC/Relay, 14DI/10DO/2AI	<b>6ES7214-1AG40-0XB0</b> CPU 1214C, DC/DC/DC, 14DI/10DO/2AI	<b>6ES7214-1HG40-0XB0</b> CPU 1214C, DC/DC/Relay, 14DI/10DO/2AI
<b>General information</b>			
Product type designation	CPU 1214C AC/DC/relay	CPU 1214C DC/DC/DC	CPU 1214C DC/DC/relay
<b>Engineering with</b>			
• Programming package	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher
<b>Supply voltage</b>			
Rated value (DC)		Yes	Yes
• 24 V DC			
Rated value (AC)	Yes		
• 120 V AC	Yes		
• 230 V AC	Yes		
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
<b>Memory</b>			
<b>Work memory</b>			
• integrated	100 kbyte	100 kbyte	100 kbyte
<b>Load memory</b>			
• integrated	4 Mbyte with SIMATIC memory card	4 Mbyte with SIMATIC memory card	4 Mbyte with SIMATIC memory card
• Plug-in (SIMATIC Memory Card), max.			
<b>Backup</b>			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time)	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number of digital outputs	10; Relays	10	10; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>			
Number of analog inputs	2	2	2
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>Analog outputs</b>			
Number of analog outputs	0	0	0
<b>1. Interface</b>			
<b>Protocols</b>			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No

## Technical specifications

Article number	<b>6ES7214-1BG40-0XB0</b> CPU 1214C, AC/DC/Relay, 14DI/10DO/2AI	<b>6ES7214-1AG40-0XB0</b> CPU 1214C, DC/DC/DC, 14DI/10DO/2AI	<b>6ES7214-1HG40-0XB0</b> CPU 1214C, DC/DC/Relay, 14DI/10DO/2AI
<b>Protocols</b>			
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>OPC UA</b>			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
<b>Communication functions</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>Integrated Functions</b>			
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
<b>Pollutant concentrations</b>			
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	455 g	415 g	435 g

## SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

### CPU 1215C

#### Overview



- Powerful controller with enhanced networking option
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

#### Ordering data

##### CPU 1215C

**Compact CPU, AC/DC/relay;**  
Integrated program/data memory  
125 KB, load memory 4 MB;  
Wide-range power supply  
85 ... 264 V AC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs,  
10 digital outputs (relays),  
2 analog inputs,  
2 analog outputs;  
Expandable by up to  
3 communications modules,  
8 signal modules and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz

##### Article No.

6ES7215-1BG40-0XB0

**Compact CPU, DC/DC/DC;**  
Integrated program/data memory  
125 KB, load memory 4 MB;  
Supply voltage 24 V DC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs,  
10 digital outputs,  
2 analog inputs,  
2 analog outputs;  
Expandable by up to  
3 communications modules,  
8 signal modules, and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO)  
or pulse-width modulated outputs  
(PWM) at 100 kHz

6ES7215-1AG40-0XB0

**Compact CPU, DC/DC/relay;**  
Integrated program/data memory  
125 KB, load memory 4 MB;  
Supply voltage 24 V DC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs,  
10 digital outputs (relays),  
2 analog inputs,  
2 analog outputs;  
Expandable by up to  
3 communications modules,  
8 signal modules, and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz

6ES7215-1HG40-0XB0

##### Article No.

##### SB 1221 signal board

4 inputs, 5 V DC, 200 kHz  
4 inputs, 24 V DC, 200 kHz

6ES7221-3AD30-0XB0

6ES7221-3BD30-0XB0

##### SB 1222 signal board

4 outputs, 5 V DC, 0.1 A, 200 kHz  
4 outputs, 24 V DC, 0.1 A, 200 kHz

6ES7222-1AD30-0XB0

6ES7222-1BD30-0XB0

##### SB 1223 signal board

2 inputs, 24 V DC,  
IEC type 1 sinking input;  
2 x 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC at  
up to 30 kHz

6ES7223-0BD30-0XB0

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

6ES7223-3AD30-0XB0

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

6ES7223-3BD30-0XB0

##### SB 1231 signal board

1 analog input, ±10 V with 12 bits or  
0 ... 20 mA with 11 bits

6ES7231-4HA30-0XB0

##### SB 1231 thermocouple signal board

1 input +/- 80 mV, resolution 15 bits  
+ sign, thermocouples type J, K

6ES7231-5QA30-0XB0

##### SB 1231 RTD signal board

1 input for resistance temperature  
sensors Pt 100, Pt 200, Pt 500,  
Pt 1000, resolution 15 bits + sign

6ES7231-5PA30-0XB0

##### SB 1232 signal board

1 analog output, ±10 V with 12 bits  
or 0 to 20 mA with 11 bits

6ES7232-4HA30-0XB0

##### CB 1241 RS485 communication board

For point-to-point connection,  
with 1 RS485 interface

6ES7241-1CH30-1XB0

Ordering data	Article No.	Ordering data	Article No.
<b>BB 1297 battery board</b> For long-term backup of real-time clock; can be plugged into the signal board slot; battery (CR1025) is not included	6ES7297-0AX30-0XA0	<b>Front flap set (spare part)</b> For CPU 1215C	6ES7291-1AC30-0XA0
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b> 14 input switches, for CPU 1214C/1215C	6ES7274-1XH30-0XA0	<b>RJ45 cable grip</b> 4 units per pack Dual port	6ES7290-3AB30-0XA0
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b> 2 potentiometers	6ES7274-1XA30-0XA0	<b>STEP 7 Professional / Basic V17</b> <b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC <b>Requirement:</b> Windows 10 (64-bit) • Windows 10 Home Version 1909, 2004, 20H2 (only STEP 7 Basic) • Windows 10 Professional Version 1909, 2004, 20H2 • Windows 10 Enterprise Version 1909, 2004, 20H2 • Windows 10 IoT Enterprise 2016 LTSC • Windows 10 IoT Enterprise 2019 LTSC Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) <b>Type of delivery:</b> 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download	
<b>SIMATIC Memory Card (optional)</b> 4 MB 12 MB 24 MB 256 MB 2 GB 32 GB	6ES7954-8LC03-0AA0 6ES7954-8LE03-0AA0 6ES7954-8LF03-0AA0 6ES7954-8LL03-0AA0 6ES7954-8LP03-0AA0 6ES7954-8LT03-0AA0	STEP 7 Professional V17, floating license	6ES7822-1AA07-0YA5
<b>Extension cable for two-tier configuration</b> For connecting digital/analog signal modules; length 2 m	6ES7290-6AA30-0XA0	STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>	6ES7822-1AE07-0YA5
<b>Terminal block (spare part)</b> For CPU 1215C AC/DC/relay • For DI, 20-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For DO, 12-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For analog signals, 6-pin, gold-plated; 4 units - Screw-type system - Push-in system For CPU 1215C DC/DC/DC • For DI, 20-pin, tin-coated; 4 units - Screw-type system - Push-in system • For DO, 12-pin, tin-plated, coded; tin-plated; 4 units - Screw-type system - Push-in system • For analog signals, 6-pin, gold-plated; 4 units - Screw-type system - Push-in system For CPU 1215C DC/DC/relay • For DI, 20-pin, tin-coated; 4 units - Screw-type system - Push-in system • For DO, 12-pin, tin-coated, coded; 4 units - Screw-type system - Push-in system • For analog signals, 6-pin, gold-plated; 4 units - Screw-type system - Push-in system	6ES7292-1AV40-0XA0 6ES7292-2AV40-0XA0 6ES7292-1AM40-0XA0 6ES7292-2AM40-0XA0 6ES7292-1BF30-0XB0 6ES7292-2BF30-0XB0 6ES7292-1AV30-0XA0 6ES7292-2AV30-0XA0 6ES7292-1AM30-0XA0 6ES7292-2AM30-0XA0 6ES7292-1BF30-0XB0 6ES7292-2BF30-0XB0 6ES7292-1AV30-0XA0 6ES7292-2AV30-0XA0 6ES7292-1AM40-0XA0 6ES7292-2AM40-0XA0 6ES7292-1BF30-0XB0 6ES7292-2BF30-0XB0	Email address required for delivery STEP 7 Basic V17, floating license STEP 7 Basic V17, floating license, software download including license key <sup>1)</sup> Email address required for delivery	6ES7822-0AA07-0YA5 6ES7822-0AE07-0YA5

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

### CPU 1215C

#### Technical specifications

Article number	<b>6ES7215-1AG40-0XB0</b> CPU 1215C, DC/DC/DC, 14DI/10DO/2AI/2AO	<b>6ES7215-1BG40-0XB0</b> CPU 1215C, AC/DC/RLY, 14DI/10DO/2AI/2AO	<b>6ES7215-1HG40-0XB0</b> CPU 1215C, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>General information</b>			
Product type designation	CPU 1215C DC/DC/DC	CPU 1215C AC/DC/relay	CPU 1215C DC/DC/relay
<b>Engineering with</b>			
• Programming package	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher
<b>Supply voltage</b>			
Rated value (DC)	Yes	Yes	Yes
• 24 V DC			
Rated value (AC)			
• 120 V AC	Yes	Yes	
• 230 V AC	Yes	Yes	
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V	L+ minus 4 V DC min.	20.4 to 28.8V	L+ minus 4 V DC min.
<b>Memory</b>			
<b>Work memory</b>			
• integrated	125 kbyte	125 kbyte	125 kbyte
<b>Load memory</b>			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time)	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number of digital outputs	10	10; Relays	10; Relays
• of which high-speed outputs	4; 100 kHz Pulse Train Output		
<b>Analog inputs</b>			
Number of analog inputs	2	2	2
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>Analog outputs</b>			
Number of analog outputs	2	2	2
<b>Output ranges, current</b>			
• 0 to 20 mA	Yes	Yes	Yes

## Technical specifications

Article number	6ES7215-1AG40-0XB0	6ES7215-1BG40-0XB0	6ES7215-1HG40-0XB0
	CPU 1215C, DC/DC/DC, 14DI/10DO/2AI/2AO	CPU 1215C, AC/DC/RLY, 14DI/10DO/2AI/2AO	CPU 1215C, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>1. Interface</b>			
<b>Protocols</b>			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes
<b>Protocols</b>			
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>OPC UA</b>			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
<b>Communication functions</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>Integrated Functions</b>			
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	4; With integrated outputs	Up to 4 with SB 1222	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs	4		
Limit frequency (pulse)	100 kHz		
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
<b>Pollutant concentrations</b>			
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	130 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	500 g	550 g	585 g

## SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

### CPU 1217C

#### Overview



- Powerful controller for extremely fast signal processing
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

#### Ordering data

##### CPU 1217C

**Compact CPU, DC/DC/DC;**  
Integrated program/data memory  
150 KB, load memory 4 MB;  
Supply voltage 24 V DC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs  
(10 digital 24 V DC inputs,  
4 digital 1.5 V DC differential  
inputs), 10 digital outputs  
(6 digital 24 V DC outputs,  
4 digital 1.5 V DC differential  
outputs), 2 analog inputs,  
2 analog outputs;  
Expandable by up to  
3 communications modules,  
8 signal modules, and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 1 MHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO) or  
pulse-width modulated outputs  
(PWM) at 100 kHz

#### Article No.

6ES7217-1AG40-0XB0

##### SB 1221 signal board

4 inputs, 5 V DC, 200 kHz  
4 inputs, 24 V DC, 200 kHz

6ES7221-3AD30-0XB0

6ES7221-3BD30-0XB0

##### SB 1222 signal board

4 outputs, 5 V DC, 0.1 A, 200 kHz  
4 outputs, 24 V DC, 0.1 A, 200 kHz

6ES7222-1AD30-0XB0

6ES7222-1BD30-0XB0

##### SB 1223 signal board

2 inputs, 24 V DC,  
IEC type 1 sinking input;  
2 x 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC at up to  
30 kHz

6ES7223-0BD30-0XB0

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

6ES7223-3AD30-0XB0

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

6ES7223-3BD30-0XB0

#### Article No.

##### SB 1231 signal board

1 analog input, ±10 V with 12 bits or  
0 ... 20 mA with 11 bits

6ES7231-4HA30-0XB0

##### SB 1231 thermocouple signal board

1 input +/- 80 mV, resolution 15 bits  
+ sign, thermocouples type J, K

6ES7231-5QA30-0XB0

##### SB 1231 RTD signal board

1 input for resistance temperature  
sensors Pt 100, Pt 200, Pt 500,  
Pt 1000, resolution 15 bits + sign

6ES7231-5PA30-0XB0

##### SB 1232 signal board

1 analog output, ±10 V with 12 bits  
or 0 to 20 mA with 11 bits

6ES7232-4HA30-0XB0

##### CB 1241 RS485 communication board

For point-to-point connection,  
with 1 RS485 interface

6ES7241-1CH30-1XB0

##### BB 1297 battery board

For long-term backup of real-time  
clock; can be plugged into the  
signal board slot;  
battery (CR1025) is not included

6ES7297-0AX30-0XA0



Ordering data	Article No.	Article No.
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b>		<b>STEP 7 Professional / Basic V17</b>
14 input switches, for CPU 1217C	<b>6ES7274-1XK30-0XA0</b>	<b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b>		<b>Requirement:</b>
2 potentiometers	<b>6ES7274-1XA30-0XA0</b>	Windows 10 (64-bit)
<b>SIMATIC Memory Card (optional)</b>		• Windows 10 Home Version 1909, 2004, 20H2 (only STEP 7 Basic)
4 MB	<b>6ES7954-8LC03-0AA0</b>	• Windows 10 Professional Version 1909, 2004, 20H2
12 MB	<b>6ES7954-8LE03-0AA0</b>	• Windows 10 Enterprise Version 1909, 2004, 20H2
24 MB	<b>6ES7954-8LF03-0AA0</b>	• Windows 10 IoT Enterprise 2016 LTSC
256 MB	<b>6ES7954-8LL03-0AA0</b>	• Windows 10 IoT Enterprise 2019 LTSC
2 GB	<b>6ES7954-8LP03-0AA0</b>	Windows Server (64-bit)
32 GB	<b>6ES7954-8LT03-0AA0</b>	• Windows Server 2016 Standard (full installation)
<b>Extension cable for two-tier configuration</b>	<b>6ES7290-6AA30-0XA0</b>	• Windows Server 2019 Standard (full installation)
For connecting digital/analog signal modules; length 2 m		<b>Type of delivery:</b> 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download
<b>Terminal block (spare part)</b>		STEP 7 Professional V17, floating license
For CPU 1217C		STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>
• For DI, 10-pin, tin-coated; 4 units - Screw-type system - Push-in system	<b>6ES7292-1AK30-0XA0</b> <b>6ES7292-2AK30-0XA0</b>	Email address required for delivery
• For DI, 16-pin, tin-coated; 4 units - Screw-type system - Push-in system	<b>6ES7292-1AR30-0XA0</b> <b>6ES7292-2AR30-0XA0</b>	STEP 7 Basic V17, floating license
• For DO, 18-pin, tin-coated; 4 units - Screw-type system - Push-in system	<b>6ES7292-1AT30-0XA0</b> <b>6ES7292-2AT30-0XA0</b>	STEP 7 Basic V17, floating license, software download including license key <sup>1)</sup>
• For analog signals, 6-pin, gold-plated; 4 units - Screw-type system - Push-in system	<b>6ES7292-1BF30-0XB0</b> <b>6ES7292-2BF30-0XB0</b>	Email address required for delivery
<b>Front flap set (spare part)</b>		
For CPU 1217C	<b>6ES7291-1AD30-0XA0</b>	
<b>RJ45 cable grip</b>		
4 units per pack		
Dual port	<b>6ES7290-3AB30-0XA0</b>	

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-1200 Basic Controllers

Central processing units  
Standard CPUs

## CPU 1217C

### Technical specifications

Article number	<b>6ES7217-1AG40-0XB0</b> CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
<b>General information</b>	
Product type designation	CPU 1217C DC/DC/DC
<b>Engineering with</b>	
• Programming package	STEP 7 V17 or higher
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Encoder supply</b>	
<b>24 V encoder supply</b>	
• 24 V	L+ minus 4 V DC min.
<b>Memory</b>	
<b>Work memory</b>	
• integrated	150 kbyte
<b>Load memory</b>	
• integrated	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card
<b>Backup</b>	
• without battery	Yes
<b>CPU processing times</b>	
for bit operations, typ.	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / Operation
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	8 kbyte; Size of bit memory address area
<b>Process image</b>	
• Inputs, adjustable	1 kbyte
• Outputs, adjustable	1 kbyte
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time)	Yes
<b>Digital inputs</b>	
Number of digital inputs	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)
<b>Digital outputs</b>	
Number of digital outputs	10
• of which high-speed outputs	4; 100 kHz Pulse Train Output
<b>Analog inputs</b>	
Number of analog inputs	2
<b>Input ranges</b>	
• Voltage	Yes
<b>Analog outputs</b>	
Number of analog outputs	2
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
<b>1. Interface</b>	
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes

Article number	<b>6ES7217-1AG40-0XB0</b> CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
<b>Protocols</b>	
<b>Open IE communication</b>	
• TCP/IP	Yes
• ISO-on-TCP (RFC1006)	Yes
• UDP	Yes
<b>Web server</b>	
• supported	Yes
<b>OPC UA</b>	
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required
<b>Communication functions</b>	
<b>S7 communication</b>	
• supported	Yes
<b>Integrated Functions</b>	
Frequency measurement	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction interface	4; With integrated outputs
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	4
Limit frequency (pulse)	1 MHz
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
<b>Pollutant concentrations</b>	
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- SCL	Yes
<b>Dimensions</b>	
Width	150 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	530 g

**Overview**

- The superior compact solution
- With 14 integral input/outputs
- Expandable with:
  - 1 signal board (SB) or communication board (CB);  
**not possible with: 6AG1212-1AE40-2XB0, 6AG1212-1BE40-2XB0, 6AG1212-1HE40-2XB0**
  - 2 signal modules (SM)
  - Max. 3 communications modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****Article No.****SIPLUS CPU 1212C compact CPU, AC/DC/relay**

(Extended temperature range and exposure to media)

Integrated program/data memory  
75 KB, load memory 1 MB;  
Wide-range power supply  
85 ... 264 V AC;  
Boolean execution times  
0.1 µs per operation;  
8 digital inputs,  
6 digital outputs (relays),  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
2 signal modules and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

**6AG1212-1BE40-4XB0****6AG1212-1BE40-2XB0****SIPLUS CPU 1212C compact CPU, DC/DC/DC**

(Extended temperature range and exposure to media)

Integrated program/data memory  
75 KB, load memory 1 MB;  
Power supply 24 V DC;  
Boolean execution times  
0.1 µs per operation;  
8 digital inputs,  
6 digital outputs,  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
2 signal modules, and 1 signal  
board/communication board;  
Digital inputs can be used as HSC  
at 100 kHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO)  
or pulse-width modulated outputs  
(PWM) at 100 kHz

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

**6AG1212-1AE40-4XB0****6AG1212-1AE40-2XB0**

# SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

## SIPLUS CPU 1212C

### Ordering data

### Article No.

### Article No.

#### SIPLUS CPU 1212C compact CPU, DC/DC/relay

(Extended temperature range and exposure to media)

Integrated program/data memory 75 KB, load memory 1 MB;  
Power supply 24 V DC;  
Boolean execution times 0.1 µs per operation;  
8 digital inputs,  
6 digital outputs (relays),  
2 analog inputs;  
Expandable by up to  
3 communications modules,  
2 signal modules, and 1 signal board/communication board;  
Digital inputs can be used as HSC at 100 kHz

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

6AG1212-1HE40-4XB0

6AG1212-1HE40-2XB0

#### Accessories

#### SIPLUS SB 1221 digital input signal board

(Extended temperature range and exposure to media; cannot be used with 6AG1212-1.....-2XB0)

4 inputs, 5 V DC, 200 kHz, sourcing input

6AG1221-3AD30-5XB0

4 inputs, 24 V DC, 200 kHz, sourcing input

6AG1221-3BD30-5XB0

#### SIPLUS SB 1222 digital output signal board

(Extended temperature range and exposure to media; cannot be used with 6AG1212-1.....-2XB0)

4 outputs, 5 V DC, 0.1 A, 200 kHz

6AG1222-1AD30-5XB0

4 outputs, 24 V DC, 0.1 A, 200 kHz

6AG1222-1BD30-5XB0

#### SIPLUS SB 1223 digital input/output signal board

(Extended temperature range and exposure to media; cannot be used with 6AG1212-1.....-2XB0)

2 inputs, 24 V DC,  
IEC type 1 sinking input;  
2 transistor outputs 24 V DC,  
0.5 A, 5 W;  
can be used as HSC at  
up to 30 kHz

- Suitable for areas with extreme exposure to media (conformal coating)
- Ambient temperature -25 ... +55 °C

6AG1223-0BD30-4XB0

6AG1223-0BD30-5XB0

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

6AG1223-3AD30-5XB0

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

6AG1223-3BD30-5XB0

#### SIPLUS SB 1232 analog output signal board

(Extended temperature range and exposure to media; cannot be used with 6AG1212-1.....-2XB0)

Ambient temperature range  
-25 ... +55 °C

1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits

6AG1232-4HA30-5XB0

Ambient temperature range  
0 ... +55 °C

1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits

6AG1232-4HA30-4XB0

#### SIPLUS CB 1241 RS 485 communication board

(Extended temperature range and exposure to media; cannot be used with 6AG1212-1.....-2XB0)

For point-to-point connection,  
with 1 RS 485 interface

6AG1241-1CH30-5XB1

#### Additional accessories

See SIMATIC S7-1200  
CPU 1212C page 3/9

## Technical specifications

Article number	6AG1212-1AE40-4XB0	6AG1212-1AE40-2XB0
Based on	6ES7212-1AE40-0XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC	6ES7212-1AE40-0XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C 60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
<ul style="list-style-type: none"> <li>At cold restart, min.</li> </ul>	0 °C	-25 °C
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

# SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

## SIPLUS CPU 1212C

### Technical specifications

Article number	6AG1212-1BE40-4XB0	6AG1212-1BE40-2XB0
Based on	6ES7212-1BE40-0XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY	6ES7212-1BE40-0XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-20 °C; = Tmin; Startup @ 0 °C 60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	-40 °C; = Tmin; Startup @ -25 °C 70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
<ul style="list-style-type: none"> <li>At cold restart, min.</li> </ul>	0 °C	-25 °C
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

## Technical specifications

Article number	6AG1212-1HE40-4XB0	6AG1212-1HE40-2XB0
Based on	6ES7212-1HE40-0XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY	6ES7212-1HE40-0XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-20 °C; = Tmin; Startup @ 0 °C 60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	-40 °C; = Tmin; Startup @ -25 °C 70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
<ul style="list-style-type: none"> <li>At cold restart, min.</li> </ul>	0 °C	-25 °C
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

## SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

### SIPLUS CPU 1214C

#### Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB);  
**not possible with: 6AG1214-1AG40-2XB0, 6AG1214-1BG40-2XB0, 6AG1214-1HG40-2XB0**
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

#### Article No.

##### SIPLUS CPU 1214C compact CPU, AC/DC/relay

(Extended temperature range and exposure to media)

Integrated program/data memory 100 KB, load memory 2 MB;  
Wide-range power supply 85 ... 264 V AC;  
Boolean execution times 0.1 µs per operation;  
14 digital inputs,  
10 digital outputs (relays),  
2 analog inputs;  
Expandable by up to 3 communications modules, 8 signal modules and 1 signal board/communication board;  
Digital inputs can be used as HSC at 100 kHz

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

**6AG1214-1BG40-4XB0**

**6AG1214-1BG40-5XB0**

**6AG1214-1BG40-2XB0**

##### SIPLUS CPU 1214C compact CPU, DC/DC/DC

(Extended temperature range and exposure to media)

Integrated program/data memory 100 KB, load memory 2 MB;  
Power supply 24 V DC;  
Boolean execution times 0.1 µs per operation;  
14 digital inputs,  
10 digital outputs,  
2 analog inputs;  
expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board;  
Digital inputs can be used as HSC at 100 kHz,  
24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

**6AG1214-1AG40-4XB0**

**6AG1214-1AG40-5XB0**

**6AG1214-1AG40-2XB0**



Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS CPU 1214C compact CPU, DC/DC/relay</b> (Extended temperature range and exposure to media) Integrated program/data memory 100 KB, load memory 2 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz <ul style="list-style-type: none"> <li>For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C</li> <li>For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C</li> <li>For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C</li> </ul>	<b>6AG1214-1HG40-4XB0</b>  <b>6AG1214-1HG40-5XB0</b>  <b>6AG1214-1HG40-2XB0</b>	<b>SIPLUS SB 1223 digital input/output signal board</b> (Extended temperature range and exposure to media; cannot be used with 6AG1214-1.....-2XB0) 2 inputs, 24 V DC, IEC type 1 sinking input; 2 transistor outputs 24 V DC, 0.5 A, 5 W; can be used as HSC at up to 30 kHz <ul style="list-style-type: none"> <li>Suitable for areas with extreme exposure to media (conformal coating)</li> <li>Ambient temperature -25 ... +55 °C</li> </ul> 2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz 2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	<b>6AG1223-0BD30-4XB0</b>  <b>6AG1223-0BD30-5XB0</b>  <b>6AG1223-3AD30-5XB0</b>  <b>6AG1223-3BD30-5XB0</b>
<b>Accessories</b> <b>SIPLUS SB 1221 digital input signal board</b> (Extended temperature range and exposure to media; cannot be used with 6AG1214-1.....-2XB0) 4 inputs, 5 V DC, 200 kHz, sourcing input 4 inputs, 24 V DC, 200 kHz, sourcing input	<b>6AG1221-3AD30-5XB0</b>  <b>6AG1221-3BD30-5XB0</b>	<b>SIPLUS SB 1232 analog output signal board</b> (Extended temperature range and exposure to media; cannot be used with 6AG1214-1.....-2XB0) <u>Ambient temperature range</u> -25 ... +55 °C 1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits <u>Ambient temperature range</u> 0 ... +55 °C 1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	<b>6AG1232-4HA30-5XB0</b>  <b>6AG1232-4HA30-4XB0</b>
<b>SIPLUS SB 1222 digital output signal board</b> (Extended temperature range and exposure to media; cannot be used with 6AG1214-1.....-2XB0) 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz	<b>6AG1222-1AD30-5XB0</b>  <b>6AG1222-1BD30-5XB0</b>	<b>SIPLUS CB 1241 RS 485 communication board</b> (Extended temperature range and exposure to media; cannot be used with 6AG1214-1.....-2XB0) For point-to-point connection, with 1 RS 485 interface	<b>6AG1241-1CH30-5XB1</b>
		<b>Additional accessories</b>	See SIMATIC S7-1200 CPU 1214C page 3/13

# SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

## SIPLUS CPU 1214C

### Technical specifications

Article number	6AG1214-1AG40-4XB0	6AG1214-1AG40-5XB0	6AG1214-1AG40-2XB0
Based on	6ES7214-1AG40-0XB0	6ES7214-1AG40-0XB0	6ES7214-1AG40-0XB0
	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

## Technical specifications

Article number	6AG1214-1AG40-4XB0	6AG1214-1AG40-5XB0	6AG1214-1AG40-2XB0
Based on	6ES7214-1AG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6ES7214-1AG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6ES7214-1AG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC
<b>Usage in industrial process technology</b>			
<ul style="list-style-type: none"> <li>- Against chemically active substances acc. to EN 60654-4</li> <li>- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	<p>Yes; Class 3 (excluding trichlorethylene)</p> <p>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</p>	<p>Yes; Class 3 (excluding trichlorethylene)</p> <p>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</p>	<p>Yes; Class 3 (excluding trichlorethylene)</p> <p>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</p>
<b>Remark</b>			
<ul style="list-style-type: none"> <li>- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>• Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>• Protection against fouling acc. to EN 60664-3</li> <li>• Military testing according to MIL-I-46058C, Amendment 7</li> <li>• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>
Article number	6AG1214-1BG40-4XB0	6AG1214-1BG40-5XB0	6AG1214-1BG40-2XB0
Based on	6ES7214-1BG40-0XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6ES7214-1BG40-0XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6ES7214-1BG40-0XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
<ul style="list-style-type: none"> <li>• min.</li> <li>• max.</li> </ul>	<p>-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C</p> <p>60 °C; = Tmax</p>	<p>-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C</p> <p>60 °C; = Tmax; Tmax &gt; +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position</p>	<p>-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C</p> <p>70 °C; = Tmax; Tmax &gt; +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax &gt; +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position</p>
<ul style="list-style-type: none"> <li>• At cold restart, min.</li> </ul>	0 °C	-25 °C	-25 °C
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>• Installation altitude above sea level, max.</li> <li>• Ambient air temperature-barometric pressure-altitude</li> </ul>	<p>2 000 m</p> <p>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC</p>	<p>2 000 m</p> <p>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC</p>	<p>2 000 m</p> <p>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC</p>
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>• With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

# SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

## SIPLUS CPU 1214C

### Technical specifications

Article number	6AG1214-1BG40-4XB0	6AG1214-1BG40-5XB0	6AG1214-1BG40-2XB0
Based on	6ES7214-1BG40-0XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6ES7214-1BG40-0XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6ES7214-1BG40-0XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Technical specifications

Article number	6AG1214-1HG40-4XB0	6AG1214-1HG40-5XB0	6AG1214-1HG40-2XB0
Based on	6ES7214-1HG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6ES7214-1HG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6ES7214-1HG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

## SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

### SIPLUS CPU 1214C

#### Technical specifications

Article number	6AG1214-1HG40-4XB0	6AG1214-1HG40-5XB0	6AG1214-1HG40-2XB0
Based on	6ES7214-1HG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6ES7214-1HG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6ES7214-1HG40-0XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**Overview**

- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB);  
**not possible with: 6AG1215-1AG40-2XB0, 6AG1215-1BG40-2XB0, 6AG1215-1HG40-2XB0**
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****Article No.****SIPLUS CPU 1215C compact CPU, AC/DC/relay**

(Extended temperature range and exposure to media)

Integrated program and data memory 125 KB, load memory 4 MB;  
wide-range power supply 85 ... 264 V AC;  
Boolean execution times 0.085 µs per operation;  
14 digital inputs,  
10 digital outputs (relay),  
2 analog inputs,  
2 analog outputs;  
expandable by up to 3 communications modules,  
8 signal modules and 1 signal board/communication board;  
digital inputs usable as HSC with 100 kHz

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

**6AG1215-1BG40-4XB0****6AG1215-1BG40-5XB0****6AG1215-1BG40-2XB0****SIPLUS CPU 1215C compact CPU, DC/DC/DC**

(Extended temperature range and exposure to media)

Integrated program and data memory 125 KB, load memory 4 MB;  
power supply 24 V DC;  
Boolean execution times 0.085 µs per operation;  
14 digital inputs,  
10 digital outputs,  
2 analog inputs,  
2 analog outputs;  
expandable by up to 3 communications modules,  
8 signal modules and 1 signal board/communication board;  
digital inputs usable as HSC with 100 kHz;  
24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

**6AG1215-1AG40-4XB0****6AG1215-1AG40-5XB0****6AG1215-1AG40-2XB0**

# SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

## SIPLUS CPU 1215C

3

### Ordering data

### Article No.

### Article No.

#### SIPLUS CPU 1215C compact CPU, DC/DC/relay

(Extended temperature range and exposure to media)

Integrated program and data memory 125 KB, load memory 4 MB;  
power supply 24 V DC;  
Boolean execution times 0.085 µs per operation;  
14 digital inputs,  
10 digital outputs (relay),  
2 analog inputs,  
2 analog outputs;  
expandable by up to  
3 communications modules,  
8 signal modules and 1 signal board/communication board;  
digital inputs usable as HSC with 100 kHz

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

6AG1215-1HG40-4XB0

6AG1215-1HG40-5XB0

6AG1215-1HG40-2XB0

#### Accessories

#### SIPLUS SB 1221 digital input signal board

(Extended temperature range and exposure to media; cannot be used with 6AG1215-1.....-2XB0)

4 inputs, 5 V DC, 200 kHz, sourcing input

6AG1221-3AD30-5XB0

4 inputs, 24 V DC, 200 kHz, sourcing input

6AG1221-3BD30-5XB0

#### SIPLUS SB 1222 digital output signal board

(Extended temperature range and exposure to media; cannot be used with 6AG1215-1.....-2XB0)

4 outputs, 5 V DC, 0.1 A, 200 kHz

6AG1222-1AD30-5XB0

4 outputs, 24 V DC, 0.1 A, 200 kHz

6AG1222-1BD30-5XB0

#### SIPLUS SB 1223 digital input/output signal board

(Extended temperature range and exposure to media; cannot be used with 6AG1215-1.....-2XB0)

2 inputs, 24 V DC,  
IEC type 1 sinking input;  
2 transistor outputs 24 V DC,  
0.5 A, 5 W;  
can be used as HSC at  
up to 30 kHz

- Suitable for areas with extreme exposure to media (conformal coating)
- Ambient temperature -25 ... +55 °C

6AG1223-0BD30-4XB0

6AG1223-0BD30-5XB0

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

6AG1223-3AD30-5XB0

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

6AG1223-3BD30-5XB0

#### SIPLUS SB 1232 analog output signal board

(Extended temperature range and exposure to media; cannot be used with 6AG1215-1.....-2XB0)

Ambient temperature range  
-25 ... +55 °C

1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits

6AG1232-4HA30-5XB0

Ambient temperature range  
0 ... +55 °C

1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits

6AG1232-4HA30-4XB0

#### SIPLUS CB 1241 RS 485 communication board

(Extended temperature range and exposure to media; cannot be used with 6AG1215-1.....-2XB0)

for point-to-point connection,  
with 1 RS 485 interface

6AG1241-1CH30-5XB1

#### Additional accessories

See SIMATIC S7-1200 CPU 1215C, page 3/17



## Technical specifications

Article number	6AG1215-1AG40-4XB0	6AG1215-1AG40-5XB0	6AG1215-1AG40-2XB0
Based on	6ES7215-1AG40-0XB0	6ES7215-1AG40-0XB0	6ES7215-1AG40-0XB0
	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

# SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

## SIPLUS CPU 1215C

### Technical specifications

Article number	6AG1215-1AG40-4XB0	6AG1215-1AG40-5XB0	6AG1215-1AG40-2XB0
Based on	6ES7215-1AG40-0XB0 SIPLUS S7-1200 CPU 1215C DC/DC/DC	6ES7215-1AG40-0XB0 SIPLUS S7-1200 CPU 1215C DC/DC/DC	6ES7215-1AG40-0XB0 SIPLUS S7-1200 CPU 1215C DC/DC/DC
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>
Article number	6AG1215-1BG40-4XB0	6AG1215-1BG40-5XB0	6AG1215-1BG40-2XB0
Based on	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> <li>At cold restart, min.</li> </ul>	<ul style="list-style-type: none"> <li>-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C</li> <li>60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical</li> <li>0 °C</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C</li> <li>60 °C; = Tmax; Tmax &gt; +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting</li> <li>-25 °C</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C</li> <li>70 °C; = Tmax; Tmax &gt; +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position;</li> <li>-25 °C</li> </ul>
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	<ul style="list-style-type: none"> <li>2 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa</li> </ul>	<ul style="list-style-type: none"> <li>2 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa</li> </ul>	<ul style="list-style-type: none"> <li>2 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa</li> </ul>
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> </ul>

## Technical specifications

Article number	6AG1215-1BG40-4XB0	6AG1215-1BG40-5XB0	6AG1215-1BG40-2XB0
Based on	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1215-1HG40-4XB0	6AG1215-1HG40-5XB0	6AG1215-1HG40-2XB0
Based on	6ES7215-1HG40-0XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY	6ES7215-1HG40-0XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY	6ES7215-1HG40-0XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 95 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC

# SIMATIC S7-1200 Basic Controllers

Central processing units  
SIPLUS standard CPUs

## SIPLUS CPU 1215C

### Technical specifications

Article number	<b>6AG1215-1HG40-4XB0</b>	<b>6AG1215-1HG40-5XB0</b>	<b>6AG1215-1HG40-2XB0</b>
Based on	<b>6ES7215-1HG40-0XB0</b> SIPLUS S7-1200 CPU 1215C DC/DC/RLY	<b>6ES7215-1HG40-0XB0</b> SIPLUS S7-1200 CPU 1215C DC/DC/RLY	<b>6ES7215-1HG40-0XB0</b> SIPLUS S7-1200 CPU 1215C DC/DC/RLY
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

### Overview



The fail-safe SIMATIC S7-1200 Controllers are based on the S7-1200 standard CPUs and offer additional safety-related functions.

They can be used for safety-oriented tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured, TÜV-approved blocks for safety-related functions.

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of the standard I/O modules together with the fail-safe I/O modules in the central system
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via field bus such as PROFINET or PROFIBUS
  - F-library certified by the German Technical Inspectorate (TÜV) for all common safety functions
  - Free programming of the safety logic using FBD and LAD
  - Standard-compliant printout of the F-program
- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio
- Integrated system diagnosis of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostic information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	CPU 1212 FC	CPU 1214 FC	CPU 1215 FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay
Main memory, integrated	100 KB	125 KB	150 KB
Load memory, integrated	2 MB	4 MB	4 MB
Memory card	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)
Standard digital inputs/outputs, integrated	8/6	14/10	14/10
Standard analog inputs, integrated	2	2	2
Standard analog outputs, integrated	-	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1	Max. 1
Expansion by signal modules	Max. 2	Max. 8	Max. 8
Expansion by communications modules	Max. 3	Max. 3	Max. 3

# SIMATIC S7-1200 Basic Controllers

## Central processing units

### Fail-safe CPUs

#### Ordering data

#### Article No.

#### Article No.

##### CPU 1212FC

##### Fail-safe compact CPU, DC/DC/DC;

integrated program/data memory 100 KB, load memory 2 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; expandable by up to 3 communications modules, 2 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz

6ES7212-1AF40-0XB0

##### Fail-safe compact CPU, DC/DC/relay;

integrated program/data memory 125 KB, load memory 2 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; expandable by up to 3 communications modules, 2 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz

6ES7212-1HF40-0XB0

##### CPU 1214FC

##### Fail-safe compact CPU, DC/DC/DC;

integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz

6ES7214-1AF40-0XB0

##### Fail-safe compact CPU, DC/DC/relay;

integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz

6ES7214-1HF40-0XB0

##### CPU 1215FC

##### Fail-safe compact CPU, DC/DC/DC;

integrated program/data memory 150 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; 2 analog outputs; expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz

6ES7215-1AF40-0XB0

##### Fail-safe compact CPU, DC/DC/relay;

integrated program/data memory 150 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; 2 analog outputs; expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz

6ES7215-1HF40-0XB0

##### Accessories

##### SIMATIC S7-1200 Fail-Safe Starter Kit

With CPU 1212 FC DC/DC/relay; also includes: F-digital input SM 1226 16 x 24 V DC, F-digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Basic and STEP 7 Safety Basic V16, SIMATIC OPC UA S7-1200 Basic, info material; in Systainer

6ES7212-1HF41-4YB1

With CPU 1214 FC DC/DC/relay; also includes: F-digital input SM 1226 16 x 24 V DC, F-digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Safety Basic, SIMATIC OPC UA S7-1200 Basic, info material; in Systainer

6ES7212-1HF42-4YB1

##### Simulator (optional)

14 incoming circuit breakers

6ES7274-1XH30-0XA0

##### SIMATIC Memory Card (optional)

4 MB

6ES7954-8LC03-0AA0

12 MB

6ES7954-8LE03-0AA0

24 MB

6ES7954-8LF03-0AA0

256 MB

6ES7954-8LL03-0AA0

2 GB

6ES7954-8LP03-0AA0

32 GB

6ES7954-8LT03-0AA0

Ordering data	Article No.	Article No.
<b>Extension cable for two-tier configuration</b> For connecting digital/analog signal modules; length 2 m	<b>6ES7290-6AA30-0XA0</b>	<b>STEP 7 Safety Advanced V17</b> <b>Task:</b> Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O <b>Requirement:</b> STEP 7 Professional V17 <b>Note:</b> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.  Floating license for 1 user; license key on USB flash drive  Floating license for 1 user; license key for download <sup>1)</sup> ; Email address required for delivery
<b>Terminal block (spare part)</b> For CPU 1214FC, DC/DC/DC <ul style="list-style-type: none"> <li>For DI, with 20 screws, tin-coated; 4 units</li> <li>For DO, with 12 screws, tin-coated; 4 units</li> <li>For AI, with 3 screws, gold-plated; 4 units</li> </ul> For CPU 1214FC, DC/DC/relay <ul style="list-style-type: none"> <li>For DI, with 20 screws, tin-coated; 4 units</li> <li>For DO, with 12 screws, tin-coated, coded; 4 units</li> <li>For AI, with 3 screws, gold-plated; 4 units</li> </ul> For CPU 1215FC, DC/DC/DC <ul style="list-style-type: none"> <li>For DI, with 20 screws, tin-coated; 4 units</li> <li>For DO, with 12 screws, tin-coated; 4 units</li> <li>For AI, with 6 screws, gold-plated; 4 units</li> </ul> For CPU 1215FC, DC/DC/relay <ul style="list-style-type: none"> <li>For DI, with 20 screws, tin-coated; 4 units</li> <li>For DO, with 12 screws, tin-coated, coded; 4 units</li> <li>For AI, with 6 screws, gold-plated; 4 units</li> </ul>	<b>6ES7292-1AV30-0XA0</b>  <b>6ES7292-1AM30-0XA0</b>  <b>6ES7292-1BC30-0XA0</b>  <b>6ES7292-1AV30-0XA0</b>  <b>6ES7292-1AM40-0XA0</b>  <b>6ES7292-1BC30-0XA0</b>  <b>6ES7292-1AV30-0XA0</b>  <b>6ES7292-1AM30-0XA0</b>  <b>6ES7292-1BF30-0XB0</b>  <b>6ES7292-1AV30-0XA0</b>  <b>6ES7292-1AM40-0XA0</b>  <b>6ES7292-1BF30-0XB0</b>	
<b>Front flap set (spare part)</b> For CPU 1214FC For CPU 1215FC	<b>6ES7291-1AB30-0XA0</b> <b>6ES7291-1AC30-0XA0</b>	
<b>RJ45 cable grip</b> 4 units per pack Single port Dual port	<b>6ES7290-3AA30-0XA0</b> <b>6ES7290-3AB30-0XA0</b>	
<b>STEP 7 Safety Basic V17</b> <b>Task:</b> Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC <b>Requirement:</b> STEP 7 Basic V17 and higher <b>Note:</b> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.  Floating license for 1 user; license key on USB flash drive  Floating license for 1 user; license key for download <sup>1)</sup> ; email address required for delivery		
<b>6ES7833-1FA17-0YA5</b>  <b>6ES7833-1FA17-0YH5</b>		
<b>6ES7833-1FB17-0YA5</b>  <b>6ES7833-1FB17-0YH5</b>		

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	6ES7212-1AF40-0XB0	6ES7212-1HF40-0XB0	6ES7214-1AF40-0XB0	6ES7214-1HF40-0XB0	6ES7215-1AF40-0XB0	6ES7215-1HF40-0XB0
	CPU 1212FC, DC/DC/DC, 8DI/6DO/2AI	CPU 1212FC, DC/DC/Relay, 8DI/6DO/2AI	CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	CPU 1214 FC, DC/DC/Relay, 14DI/10DO/2AI	CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/2AO	CPU 1215 FC, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>General information</b>						
Product type designation	CPU 1212FC DC/DC/DC	CPU 1212FC DC/DC/relay	CPU 1214FC DC/DC/DC	CPU 1214FC DC/DC/Relay	CPU 1215FC DC/DC/DC	CPU 1215FC DC/DC/relay
<b>Engineering with</b>						
• Programming package	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher
<b>Supply voltage</b>						
Rated value (DC)						
• 24 V DC	Yes	Yes	Yes	Yes	Yes	Yes

# SIMATIC S7-1200 Basic Controllers

## Central processing units

### Fail-safe CPUs

#### Technical specifications

Article number	6ES7212-1AF40-0XB0	6ES7212-1HF40-0XB0	6ES7214-1AF40-0XB0	6ES7214-1HF40-0XB0	6ES7215-1AF40-0XB0	6ES7215-1HF40-0XB0
	CPU 1212FC, DC/DC/DC, 8DI/6DO/2AI	CPU 1212FC, DC/DC/Relay, 8DI/6DO/2AI	CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	CPU 1214 FC, DC/DC/Relay, 14DI/10DO/2AI	CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/2AO	CPU 1215 FC, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>Encoder supply</b>						
<b>24 V encoder supply</b>						
• 24 V	L+ minus 4 V DC min.	L+ minus 4 V DC min.	L+ minus 4 V DC min.	L+ minus 4 V DC min.	L+ minus 4 V DC min.	L+ minus 4 V DC min.
<b>Memory</b>						
<b>Work memory</b>						
• integrated	100 kbyte	100 kbyte	125 kbyte	125 kbyte	150 kbyte	150 kbyte
<b>Load memory</b>						
• integrated	2 Mbyte	2 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>						
• without battery	Yes	Yes	Yes	Yes	Yes	Yes
<b>CPU processing times</b>						
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
<b>Data areas and their retentivity</b>						
<b>Flag</b>						
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
<b>Process image</b>						
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>						
<b>Clock</b>						
• Hardware clock (real-time)	Yes	Yes	Yes	Yes	Yes	Yes
<b>Digital inputs</b>						
Number of digital inputs	8; Integrated	8; Integrated	14; Integrated	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>						
Number of digital outputs	6	6; Relays	10	10; Relays	10	10; Relays
• of which high-speed outputs	4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>						
Number of analog inputs	2	2	2	2	2	2
<b>Input ranges</b>						
• Voltage	Yes	Yes	Yes	Yes	Yes	Yes
<b>Analog outputs</b>						
Number of analog outputs	0	0		0	2	2
<b>Output ranges, current</b>						
• 0 to 20 mA					Yes	Yes
<b>1. Interface</b>						
<b>Protocols</b>						
• PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes	Yes	Yes
• Media redundancy	No	No	No	No	Yes; as MRP client	Yes



## Technical specifications

Article number	6ES7212-1AF40-0XB0	6ES7212-1HF40-0XB0	6ES7214-1AF40-0XB0	6ES7214-1HF40-0XB0	6ES7215-1AF40-0XB0	6ES7215-1HF40-0XB0
	CPU 1212FC, DC/DC/DC, 8DI/6DO/2AI	CPU 1212FC, DC/DC/Relay, 8DI/6DO/2AI	CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	CPU 1214 FC, DC/DC/Relay, 14DI/10DO/2AI	CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/2AO	CPU 1215 FC, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>Protocols</b>						
<b>Open IE communication</b>						
• TCP/IP	Yes	Yes	Yes	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes	Yes	Yes	Yes
• UDP	Yes	Yes	Yes	Yes	Yes	Yes
<b>Web server</b>						
• supported	Yes	Yes	Yes	Yes	Yes	Yes
<b>OPC UA</b>						
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
<b>Communication functions</b>						
<b>S7 communication</b>						
• supported	Yes	Yes	Yes	Yes	Yes	Yes
<b>Integrated Functions</b>						
Frequency measurement	Yes	Yes	Yes	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes	Yes	Yes	Yes
Number of alarm inputs	4	4	4	4	4	4
Number of pulse outputs	4		4		4	
Limit frequency (pulse)	100 kHz		100 kHz		100 kHz	
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• max.	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical
<b>Pollutant concentrations</b>						
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Configuration</b>						
<b>Programming</b>						
<b>Programming language</b>						
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- SCL	Yes	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>						
Width	90 mm	90 mm	110 mm	110 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm	75 mm
<b>Weights</b>						
Weight, approx.	370 g	385 g	415 g	435 g	500 g	585 g

## SIMATIC S7-1200 Basic Controllers

### Central processing units

#### SIPLUS fail-safe CPUs

#### Overview



The fail-safe SIPLUS S7-1200 Controllers are based on the SIPLUS S7-1200 standard CPUs and offer additional safety-related functions.

They can be used for safety-oriented tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal engineering framework. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured blocks for safety-related functions certified by the German Technical Inspectorate (TÜV).

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of the standard I/O modules together with the fail-safe I/O modules in the central system
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via fieldbus such as PROFINET or PROFIBUS
  - TÜV-approved F-library for all common safety functions
  - Free programming of the safety logic using FBD and LAD
  - Standard-compliant printout of the F-program
- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio
- Integrated system diagnosis of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostic information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	SIPLUS CPU 1214 FC	SIPLUS CPU 1215 FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC
Work memory, integrated	125 KB	150 KB
Load memory, integrated	4 MB	4 MB
Memory card	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)
Standard digital inputs/outputs, integrated	14/10	14/10
Standard analog inputs, integrated	2	2
Standard analog outputs, integrated	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1
Expansion by signal modules	Max. 8	Max. 8
Expansion by communications modules	Max. 3	Max. 3

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data	Article No.	Ordering data	Article No.
<p><b>CPU 1214 FC</b> (Extended temperature range and exposure to media)</p> <p><b>Fail-safe compact CPU, DC/DC/DC;</b> Integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz</p>	6AG1214-1AF40-5XB0	<p><b>CPU 1215 FC</b> (Extended temperature range and exposure to media)</p> <p><b>Fail-safe compact CPU, DC/DC/DC</b> Integrated program/data memory 150 KB, load memory 4 MB Power supply 24 V DC Boolean execution times 0.085 µs per operation 14 digital inputs, 10 digital outputs 2 analog inputs; 2 analog outputs Expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board Digital inputs can be used as HSC at 100 kHz 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz</p>	6AG1215-1AF40-5XB0
<p><b>Fail-safe compact CPU, DC/DC/relay</b> Integrated program/data memory 125 KB, load memory 4 MB; power supply 24 V DC Boolean execution times 0.085 µs per operation 14 digital inputs, 10 digital outputs (relays) 2 analog inputs Expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board Digital inputs can be used as HSC at 100 kHz</p>	6AG1214-1HF40-5XB0	<p><b>Accessories</b></p>	See SIMATIC CPU 121x FC, page 3/42

# SIMATIC S7-1200 Basic Controllers

## Central processing units

### SIPLUS fail-safe CPUs

#### Technical specifications

Article number	6AG1214-1AF40-5XB0	6AG1214-1HF40-5XB0	6AG1215-1AF40-5XB0
Based on	6ES7214-1AF40-0XB0	6ES7214-1HF40-0XB0	6ES7215-1AF40-0XB0
	SIPLUS S7-1200 CPU 1214FC DC/DC/DC	SIPLUS S7-1200 CPU 1214FC DC/DC/RLY	SIPLUS S7-1200 CPU 1215FC DC/DC/DC
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	55 °C; = Tmax	55 °C; = Tmax	55 °C; = Tmax
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes	Yes	Yes
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs

## Ordering data

## Article No.

**SM 1221 digital input signal module**

8 inputs, 24 V DC, isolated, switching to P/M potential

**6ES7221-1BF32-0XB0**

16 inputs, 24 V DC, isolated, switching to P/M potential

**6ES7221-1BH32-0XB0**

**Extension cable for two-tier configuration**

For connecting digital/analog signal modules; length 2 m

**6ES7290-6AA30-0XA0**

**Terminal block (spare part)**

For 6ES7221-1BF32-0XB0, 6ES7221-1BH32-0XB0

- 7-pin, tin-coated; 4 units
- Screw-type system
- Push-in system

**6ES7292-1AG30-0XA0**

**6ES7292-2AG30-0XA0**

**Front flap set (spare part)**

For modules with a width of 45 mm

**6ES7291-1BA30-0XA0**

## Technical specifications

Article number	<b>6ES7221-1BF32-0XB0</b>	<b>6ES7221-1BH32-0XB0</b>
	Digital Input SM 1221, 8DI, 24V DC	Digital Input SM 1221, 16DI, 24V DC
<b>General information</b>		
Product type designation	SM 1221, DI 8x24 V DC	SM 1221, DI 16x24 V DC
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
<b>Input current</b>		
from backplane bus 5 V DC, max.	105 mA	130 mA
<b>Digital inputs</b>		
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel
<b>Output voltage</b>		
<b>Power supply to the transmitters</b>		
• present	Yes	Yes
<b>Digital inputs</b>		
Number of digital inputs	8	16
• in groups of	2	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
<b>Number of simultaneously controllable inputs</b>		
<b>all mounting positions</b>		
- up to 40 °C, max.	8	16
<b>horizontal installation</b>		
- up to 40 °C, max.	8	16
- up to 50 °C, max.	8	16
<b>vertical installation</b>		
- up to 40 °C, max.	8	16
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA

# SIMATIC S7-1200 Basic Controllers

I/O modules

Digital modules

## SM 1221 digital input modules

### Technical specifications

Article number	<b>6ES7221-1BF32-0XB0</b> Digital Input SM 1221, 8DI, 24V DC	<b>6ES7221-1BH32-0XB0</b> Digital Input SM 1221, 16DI, 24V DC
<b>Input current</b>		
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>		
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
<b>for interrupt inputs</b>		
- parameterizable	Yes	Yes
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the inputs	Yes	Yes
<b>Potential separation</b>		
<b>Potential separation digital inputs</b>		
• between the channels, in groups of	2	4
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Enclosure material (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	170 g	210 g

## Overview



- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

## Ordering data

## Article No.

**SB 1221 Signal Board digital input modules**

4 inputs, 5 V DC, 200 kHz, sourcing input

**6ES7221-3AD30-0XB0**

4 inputs, 24 V DC, 200 kHz, sourcing input

**6ES7221-3BD30-0XB0****Terminal block (spare part)**

for Signal Board  
with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0**

## Technical specifications

Article number	<b>6ES7221-3AD30-0XB0</b>	<b>6ES7221-3BD30-0XB0</b>
	Signal Board SB 1221, 4 DI 5VDC 200KHz	Signal Board SB 1221, 4 DI 24VDC 200KHz
<b>General information</b>		
Product type designation	SB 1221, DI 4x5 V DC 200 kHz	SB 1221, DI 4x24 V DC 200 kHz
<b>Input current</b>		
from backplane bus 5 V DC, typ.	40 mA	40 mA
<b>Digital inputs</b>		
Number of digital inputs	4; Current-sourcing	4; Current-sourcing
• in groups of	4	4
<b>Input voltage</b>		
• Type of input voltage	DC	DC
• Rated value (DC)	5 V	24 V
• for signal "0"	(L+ minus 1.0 V DC) ... L+ (2.2 ... 0 mA)	(L+ minus 5.0 V DC) ... L+ (1.4 ... 0 mA)
• for signal "1"	0 V ... (L+ minus 2.0 V DC (20 ... 5.1 mA))	0 V ... (L+ minus 10 V DC (10 ... 2.9 mA))
<b>Input current</b>		
• for signal "0", max. (permissible quiescent current)	2.2 mA	1.4 mA
• for signal "1", min.	5.1 mA	2.9 mA
• for signal "1", typ.		7 mA
<b>Input delay (for rated value of input voltage)</b>		
<b>for standard inputs</b>		
- parameterizable	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
<b>for interrupt inputs</b>		
- parameterizable	Yes	Yes
<b>for technological functions</b>		
- parameterizable	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the inputs	Yes	Yes

**SIMATIC S7-1200 Basic Controllers**

I/O modules

Digital modules

**SB 1221 digital input modules****Technical specifications**

Article number	<b>6ES7221-3AD30-0XB0</b>	<b>6ES7221-3BD30-0XB0</b>
	Signal Board SB 1221, 4 DI 5VDC 200KHz	Signal Board SB 1221, 4 DI 24VDC 200KHz
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Mechanics/material</b>		
Enclosure material (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
<b>Weights</b>		
Weight, approx.	35 g	35 g



## Overview



- Digital outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional outputs

## Ordering data

## Article No.

**SM 1222 digital output signal module**

8 outputs, 24 V DC; 0.5 A, 5 W, isolated

**6ES7222-1BF32-0XB0**

16 outputs, 24 V DC; 0.5 A, 5 W, isolated

**6ES7222-1BH32-0XB0**

16 outputs, 24 V DC; 0.5 A, 5 W, isolated, switching to P potential

**6ES7222-1BH32-1XB0**

8 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC

**6ES7222-1HF32-0XB0**

8 relay outputs, changeover contact, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC

**6ES7222-1XF32-0XB0**

16 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC

**6ES7222-1HH32-0XB0**

**Extension cable for two-tier configuration**

**6ES7290-6AA30-0XA0**

For connecting digital/analog signal modules; length 2 m

**Terminal block (spare part)**

For 6ES7222-1BF32-0XB0, 6ES7222-1BH32-0XB0

- 7-pin, tin-coated; 4 units
  - Screw-type system
  - Push-in system

**6ES7292-1AG30-0XA0**  
**6ES7292-2AG30-0XA0**

For 6ES7222-1HF32-0XB0

- 7-pin, tin-coated, left coded; 4 units
  - Screw-type system
  - Push-in system

**6ES7292-1AG40-0XA1**  
**6ES7292-2AG40-0XA1**

For 6ES7222-1HH32-0XB0

- 7-pin, tin-coated, right coded; 4 units
  - Screw-type system
  - Push-in system

**6ES7292-1AG40-0XA0**  
**6ES7292-2AG40-0XA0**

For 6ES7222-1XF32-0XB0

- 11-pin, tin-coated, right coded; 4 units
  - Screw-type system
  - Push-in system

**6ES7292-1AL40-0XA0**  
**6ES7292-2AL40-0XA0**

**Front flap set (spare part)**

For modules with a width of 45 mm

**6ES7291-1BA30-0XA0**

For modules with a width of 70 mm

**6ES7291-1BB30-0XA0**

# SIMATIC S7-1200 Basic Controllers

I/O modules

Digital modules

## SM 1222 digital output modules

### Technical specifications

Article number	6ES7222-1BF32-0XB0	6ES7222-1BH32-0XB0	6ES7222-1BH32-1XB0	6ES7222-1HF32-0XB0	6ES7222-1HH32-0XB0	6ES7222-1XF32-0XB0
	Digital Output SM1222, 8 DO, 24V DC	Digital Output SM1222, 16 DO, 24V DC	Digital Output SM1222, 16DO, 24V DC sink	Digital Output SM 1222, 8 DO, Relay	Digital Output SM1222, 16 DO, Relay	Digital Output SM 1222, 8 DO, Changeover
<b>General information</b>						
Product type designation	SM 1222, DQ 8x24 V DC/0.5 A	SM 1222, DQ 16x24 V DC/0.5 A	SM 1222, DO 16x 24 V DC/0.5 A Sink	SM 1222, DQ 8x relay/2 A	SM 1222, DQ 16x relay/2 A	SM 1222, DQ 8x relay/2 A
<b>Input current</b>						
from backplane bus 5 V DC, max.	120 mA	140 mA	140 mA	120 mA	135 mA	140 mA
<b>Digital outputs</b>						
• from load voltage L+, max.				11 mA/relay coil	11 mA/relay coil	16.7 mA/relay coil
<b>Digital outputs</b>						
Number of digital outputs	8	16	16	8	16	8
• in groups of	1	1	1	2	1	1
Current-sinking			Yes			
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -48 V	typ. (L+) -48 V	Typ 45 V			
<b>Switching capacity of the outputs</b>						
• with resistive load, max.	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
<b>Output voltage</b>						
• Rated value (DC)	24 V	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)				5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load	L+ minus 0.75 V DC with 10k Load			
• for signal "1", min.	20 V DC	20 V DC				
<b>Output current</b>						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA	75 µA			
<b>Output delay with resistive load</b>						
• "0" to "1", max.	50 µs	50 µs	20 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	350 µs	10 ms	10 ms	10 ms
<b>Total current of the outputs (per group)</b>						
<b>horizontal installation</b>						
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	8 A; Current per mass	10 A; Current per mass	10 A; Current per mass	2 A; Current per mass
<b>Relay outputs</b>						
• Number of relay outputs				8	16	8
• Rated supply voltage of relay coil L+ (DC)				24 V	24 V	24 V
• Number of operating cycles, max.				mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
<b>Switching capacity of contacts</b>						
- with inductive load, max.	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
- on lamp load, max.	5 W	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A

## Technical specifications

Article number	6ES7222-1BF32-0XB0	6ES7222-1BH32-0XB0	6ES7222-1BH32-1XB0	6ES7222-1HF32-0XB0	6ES7222-1HH32-0XB0	6ES7222-1XF32-0XB0
	Digital Output SM1222, 8 DO, 24V DC	Digital Output SM1222, 16 DO, 24V DC	Digital Output SM1222, 16DO, 24V DC sink	Digital Output SM 1222, 8 DO, Relay	Digital Output SM1222, 16 DO, Relay	Digital Output SM 1222, 8 DO, Changeover
<b>Interrupts/diagnostics/status information</b>						
<b>Alarms</b>						
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>						
• for status of the outputs	Yes	Yes	Yes	Yes	Yes	Yes
<b>Potential separation</b>						
<b>Potential separation digital outputs</b>						
• between the channels				Relays	Relays	Relays
• between the channels, in groups of	1	1	1	2	4	1
• between the channels and backplane bus	500 V AC	500 V AC	500 V AC	1 500 V AC for 1 minute	1 500 V AC for 1 minute	1 500 V AC for 1 minute
<b>Standards, approvals, certificates</b>						
CE mark	Yes	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes	Yes
KC approval	Yes	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical
<b>Connection method</b>						
required front connector	Yes	Yes	Yes	Yes	Yes	Yes
<b>Mechanics/material</b>						
Enclosure material (front)						
• Plastic	Yes	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>						
Width	45 mm	45 mm	45 mm	45 mm	45 mm	70 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm	75 mm
<b>Weights</b>						
Weight, approx.	180 g	220 g	220 g	190 g	260 g	310 g

**SIMATIC S7-1200 Basic Controllers**

I/O modules

Digital modules

**SB 1222 digital output modules****Overview**

- Digital outputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

**Ordering data****Article No.****SB 1222 Signal Board digital output modules**

4 outputs, 5 V DC, 0.1 A, 200 kHz

**6ES7222-1AD30-0XB0**

4 outputs, 24 V DC, 0.1 A, 200 kHz

**6ES7222-1BD30-0XB0****Terminal block (spare part)**

for Signal Board

with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0**

## Technical specifications

Article number	6ES7222-1AD30-0XB0	6ES7222-1BD30-0XB0
	Signal Board SB1222, 4 DQ 5VDC 200KHz	Signal Board SB1222, 4 DQ 24VDC 200KHz
<b>General information</b>		
Product type designation	SB 1222, DQ 4x5 V DC 200 kHz	SB 1222, DQ 4x24 V DC 200 kHz
<b>Input current</b>		
from backplane bus 5 V DC, typ.	35 mA	35 mA
<b>Digital outputs</b>		
Number of digital outputs	4; MOSFET, solid-state (current-sinking/current-sourcing)	4; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	4	4
Short-circuit protection	No	No
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	0.1 A	0.1 A
<b>Load resistance range</b>		
• upper limit	7 Ω	11 Ω
<b>Output voltage</b>		
• Rated value (DC)	5 V	24 V
• for signal "0", max.	0.2 V	1 V; with 10 kOhm load
• for signal "1", min.	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.	6 V	
<b>Output current</b>		
• for signal "1" permissible range, max.	0.1 A	0.1 A
<b>Diagnostics indication LED</b>		
• for status of the outputs	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Mechanics/material</b>		
Enclosure material (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
<b>Weights</b>		
Weight, approx.	35 g	35 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

Digital modules

### SM 1223 digital input/output modules

#### Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs and outputs

#### Ordering data

#### Article No.

##### SM 1223 digital input/output signal module

8 inputs, 24 V DC,  
IEC type 1 sinking input;  
8 x 24 V DC transistor outputs,  
0.5 A, 5 W

6ES7223-1BH32-0XB0

16 inputs, 24 V DC,  
IEC type 1 sinking input;  
16 x 24 V DC transistor outputs,  
0.5 A, 5 W

6ES7223-1BL32-0XB0

16 inputs, 24 V DC,  
IEC type 1 sinking input;  
16 x 24 V DC transistor outputs,  
0.5 A, 5 W, switching to P potential

6ES7223-1BL32-1XB0

8 inputs, 24 V DC,  
IEC type 1 sinking input;  
8 relay outputs,  
5 ... 30 V DC/5 ... 250 V AC, 2 A,  
30 W DC/200 W AC

6ES7223-1PH32-0XB0

16 inputs, 24 V DC,  
IEC type 1 sinking input;  
16 relay outputs,  
5 ... 30 V DC/5 ... 250 V AC, 2 A,  
30 W DC/200 W AC

6ES7223-1PL32-0XB0

8 inputs, 120/230 V AC;  
8 relay outputs,  
5 ... 30 V DC/5 ... 250 V AC, 2 A,  
30 W DC/200 W AC

6ES7223-1QH32-0XB0

##### Extension cable for two-tier configuration

For connecting digital/analog signal modules; length 2 m

6ES7290-6AA30-0XA0

##### Terminal block (spare part)

For 6ES7223-1BH32-0XB0

- 7-pin, tin-coated; 4 units
  - Screw-type system
  - Push-in system

6ES7292-1AG30-0XA0  
6ES7292-2AG30-0XA0

For 6ES7223-1BL32-0XB0

- 11-pin, tin-coated; 4 units
  - Screw-type system
  - Push-in system

6ES7292-1AL30-0XA0  
6ES7292-2AL30-0XA0

For 6ES7223-1PH32-0XB0

- 7-pin, tin-coated; 4 units
  - Screw-type system
  - Push-in system
- 7-pin, tin-coated, right coded; 4 units
  - Screw-type system
  - Push-in system

6ES7292-1AG30-0XA0  
6ES7292-2AG30-0XA06ES7292-1AG40-0XA0  
6ES7292-2AG40-0XA0

For 6ES7223-1PL32-0XB0

- 11-pin, tin-coated; 4 units
  - Screw-type system
  - Push-in system
- 11-pin, tin-coated, coded; 4 units
  - Screw-type system
  - Push-in system

6ES7292-1AL30-0XA0  
6ES7292-2AL30-0XA06ES7292-1AL40-0XA0  
6ES7292-2AL40-0XA0

For 6ES7223-1QH32-0XB0

- 7-pin, tin-coated, right coded; 4 units
  - Screw-type system
  - Push-in system

6ES7292-1AG40-0XA0  
6ES7292-2AG40-0XA0

##### Front flap set (spare part)

For modules with a width of 45 mm

6ES7291-1BA30-0XA0

For modules with a width of 70 mm

6ES7291-1BB30-0XA0

## Technical specifications

Article number	6ES7223-1BH32-0XB0	6ES7223-1BL32-0XB0	6ES7223-1BL32-1XB0	6ES7223-1PH32-0XB0	6ES7223-1PL32-0XB0	6ES7223-1QH32-0XB0
	Digital I/O SM 1223, 8 DI/8 DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 16DI/16DO sink	Digital I/O SM 1223, 8DI/8DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 8DI AC/ 8DO Rly
<b>General information</b>						
Product type designation	SM 1223, DI 8x24 V DC, DQ 8x24 V DC	SM 1223, DI 16x24 V DC, DQ 16x24 V DC	SM 1223, DI 16x24 V DC, DO 16x 24 V DC Sink	SM 1223, DI 8x24 V DC, DQ 8x relay	SM 1223, DI 16x24 V DC, DQ 16x relay	SM 1223, DI 8x120/230 V AC, DQ 8x relay
<b>Supply voltage</b>						
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
<b>Input current</b>						
from backplane bus 5 V DC, max.	145 mA	185 mA	185 mA	145 mA	180 mA	120 mA
<b>Digital inputs</b>						
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel	4 mA; per channel	4 mA/input 11 mA/relay	4 mA/input 11 mA/relay	
<b>Output voltage</b>						
<b>Power supply to the transmitters</b>						
• present	Yes	Yes	Yes	Yes	Yes	Yes
<b>Digital inputs</b>						
Number of digital inputs	8	16	16	8	16	8
• in groups of	2	2	2	2	2	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>						
<b>all mounting positions</b>						
- up to 40 °C, max.	8	16	16	8	16	8
<b>horizontal installation</b>						
- up to 40 °C, max.	8	16	16	8	16	8
- up to 50 °C, max.	8	16	16	8	16	8
<b>vertical installation</b>						
- up to 40 °C, max.	8	16	16	8	16	8
<b>Input voltage</b>						
• Type of input voltage	DC	DC	DC	DC	DC	AC
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	
• Rated value (AC)						120/230 V AC
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	20 V AC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	79 V AC at 2.5 mA
<b>Input current</b>						
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA	4 mA	9 mA
<b>Input delay (for rated value of input voltage)</b>						
<b>for standard inputs</b>						
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
<b>for interrupt inputs</b>						
- parameterizable	Yes	Yes	Yes	Yes	Yes	Yes

# SIMATIC S7-1200 Basic Controllers

I/O modules

Digital modules

## SM 1223 digital input/output modules

### Technical specifications

Article number	6ES7223-1BH32-0XB0	6ES7223-1BL32-0XB0	6ES7223-1BL32-1XB0	6ES7223-1PH32-0XB0	6ES7223-1PL32-0XB0	6ES7223-1QH32-0XB0
	Digital I/O SM 1223, 8 DI/8 DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 16DI/16DO sink	Digital I/O SM 1223, 8DI/8DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 8DI AC/ 8DO Rly
<b>Digital outputs</b>						
Number of digital outputs	8	16	16; Transistor sinking input	8	16	8
• in groups of	1	1	1	2	4	4
Short-circuit protection	No; to be provided externally	No; to be provided externally	Yes; 1 to 3.5 A	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)	Typ 45 V			
<b>Switching capacity of the outputs</b>						
• with resistive load, max.	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
<b>Output voltage</b>						
• Rated value (DC)	24 V	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)				5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load	L+ minus 0.75 V DC with 10k Load			
• for signal "1", min.	20 V DC	20 V DC				
<b>Output current</b>						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA	75 µA			
<b>Output delay with resistive load</b>						
• "0" to "1", max.	50 µs	50 µs	20 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	350 µs	10 ms	10 ms	10 ms
<b>Total current of the outputs (per group)</b>						
<b>horizontal installation</b>						
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	8 A; Current per mass	10 A; Current per mass	8 A; Current per mass	8 A; Current per mass
<b>Relay outputs</b>						
• Number of relay outputs				8	16	8
• Rated supply voltage of relay coil L+ (DC)				24 V	24 V	24 V
• Number of operating cycles, max.				mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
<b>Switching capacity of contacts</b>						
- with inductive load, max.		0.5 A	0.5 A	2 A	2 A	2 A
- on lamp load, max.		5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.		0.5 A	0.5 A	2 A	2 A	2 A
<b>Interrupts/diagnostics/ status information</b>						
<b>Alarms</b>						
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>						
• for status of the inputs	Yes	Yes	Yes	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes	Yes	Yes	Yes



## Technical specifications

Article number	6ES7223-1BH32-0XB0	6ES7223-1BL32-0XB0	6ES7223-1BL32-1XB0	6ES7223-1PH32-0XB0	6ES7223-1PL32-0XB0	6ES7223-1QH32-0XB0
	Digital I/O SM 1223, 8 DI/8 DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 16DI/16DO sink	Digital I/O SM 1223, 8DI/8DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 8DI AC/ 8DO Rly
<b>Potential separation</b>						
<b>Potential separation digital inputs</b>						
• between the channels, in groups of	2	2	2	2	2	2
<b>Potential separation digital outputs</b>						
• between the channels				Relays	Relays	Relays
• between the channels, in groups of	1	1	1	2	4	2
• between the channels and backplane bus	500 V AC	500 V AC	500 V AC	1 500 V AC for 1 minute	1 500 V AC for 1 minute	1 500 V AC for 1 minute
<b>Standards, approvals, certificates</b>						
CE mark	Yes	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes	Yes
KC approval	Yes	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical
<b>Connection method</b>						
required front connector	Yes	Yes	Yes	Yes	Yes	Yes
<b>Mechanics/material</b>						
Enclosure material (front)						
• Plastic	Yes	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>						
Width	45 mm	70 mm	70 mm	45 mm	70 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm	75 mm
<b>Weights</b>						
Weight, approx.	210 g	310 g	310 g	230 g	350 g	230 g

# SIMATIC S7-1200 Basic Controllers

I/O modules

Digital modules

## SB 1223 digital input/output modules

### Overview



- Digital inputs and outputs as supplement to the integral I/O of the SIMATIC S7-1200 CPUs
- Can be plugged direct into the CPU

### Ordering data

### Article No.

#### SB 1223 digital input/output signal board

2 inputs, 24 V DC, IEC type 1 sinking input; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz

**6ES7223-0BD30-0XB0**

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

**6ES7223-3AD30-0XB0**

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

**6ES7223-3BD30-0XB0**

#### Terminal block (spare part)

for signal board

with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0**

### Technical specifications

Article number	<b>6ES7223-0BD30-0XB0</b> Signal Board SB1223, 2 DI/2 DO	<b>6ES7223-3AD30-0XB0</b> Signal Board SB 1223, 2DI/2DQ 5V 200kHz	<b>6ES7223-3BD30-0XB0</b> Signal Board SB 1223, 2DI/2DQ 24V 200kHz
<b>General information</b>			
Product type designation	SB 1223, DI 2x24 V DC/ DQ 2x24 V DC	SB 1223, DI 2x5 V DC/ DQ 2x5 V DC 200 kHz	SB 1223, DI 2x24 V DC/ DQ 2x24 V DC 200 kHz
<b>Input current</b> from backplane bus 5 V DC, typ.	50 mA	35 mA	35 mA
<b>Output voltage</b>			
<b>Power supply to the transmitters</b> • Supply current, max.	4 mA; per channel		
<b>Digital inputs</b>			
Number of digital inputs	2; Current-sinking	2; Current-sourcing	2; Current-sourcing
• in groups of	1	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes		
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b> - up to 40 °C, max.	2		2
<b>Input voltage</b>			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	5 V	24 V
• for signal "0"	0 to 5 V	(L+ minus 1.0 V DC) ... L+	(L+ minus 5.0 V DC) ... L+
• for signal "1"	+15 to +30 V	0 V ... (L+ minus 2.0 V DC)	0 V ... (L+ minus 10 V DC)
<b>Input current</b>			
• for signal "0", max. (permissible quiescent current)	1 mA	2.2 mA	1.4 mA
• for signal "1", min.		5.1 mA	2.9 mA
• for signal "1", typ.	0.5 A		7 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b> - parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
<b>for interrupt inputs</b> - parameterizable	Yes	Yes	Yes
<b>for technological functions</b> - parameterizable	Yes	Yes	Yes

## Technical specifications

Article number	6ES7223-0BD30-0XB0 Signal Board SB1223, 2 DI/2 DO	6ES7223-3AD30-0XB0 Signal Board SB 1223, 2DI/2DQ 5V 200KHz	6ES7223-3BD30-0XB0 Signal Board SB 1223, 2DI/2DQ 24V 200KHz
<b>Digital outputs</b>			
Number of digital outputs	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	1	2	2
Short-circuit protection	No	No	No
<b>Switching capacity of the outputs</b>			
• with resistive load, max.	0.5 A	0.1 A	0.1 A
• on lamp load, max.	5 W		
<b>Load resistance range</b>			
• upper limit	0.6 Ω	7 Ω	
<b>Output voltage</b>			
• Rated value (DC)	24 V	5 V	24 V
• for signal "0", max.	0.1 V; with 10 kOhm load	0.2 V	1 V
• for signal "1", min.	20 V	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.		6 V	
<b>Output current</b>			
• for signal "1" permissible range, max.	0.5 A	0.1 A	0.1 A
• for signal "0" residual current, max.	10 μA		
<b>Interrupts/diagnostics/ status information</b>			
Alarms	Yes		
Diagnostics function	Yes		
<b>Diagnostics indication LED</b>			
• for status of the inputs	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
cULus	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes
KC approval	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
<b>Mechanics/material</b>			
Enclosure material (front)			
• Plastic	Yes	Yes	Yes
<b>Dimensions</b>			
Width	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm
<b>Weights</b>			
Weight, approx.	40 g	35 g	35 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS digital modules

### SIPLUS SM 1221 digital input modules

#### Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### Digital input SIPLUS signal module SM 1221

(Extended temperature range and exposure to media)

8 inputs, 24 V DC, isolated, switching to P/M potential

- Suitable for areas with extreme exposure to media (conformal coating)

**6AG1221-1BF32-4XB0**

- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1221-1BF32-2XB0**

16 inputs, 24 V DC, isolated, switching to P/M potential

- Suitable for areas with extreme exposure to media (conformal coating)

**6AG1221-1BH32-4XB0**

- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1221-1BH32-2XB0**

#### Accessories

See SIMATIC S7-1200 SM 1221 digital input modules, page 3/49

#### Technical specifications

Article number	<b>6AG1221-1BF32-2XB0</b>	<b>6AG1221-1BF32-4XB0</b>	<b>6AG1221-1BH32-2XB0</b>	<b>6AG1221-1BH32-4XB0</b>
Based on	<b>6ES7221-1BF32-0XB0</b> SIPLUS S7-1200 SM 1221 8DI	<b>6ES7221-1BF32-0XB0</b> SIPLUS S7-1200 SM 1221 8DI	<b>6ES7221-1BH32-0XB0</b> SIPLUS S7-1200 SM 1221 16DI	<b>6ES7221-1BH32-0XB0</b> SIPLUS S7-1200 SM 1221 16DI
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

**Technical specifications**

Article number	<b>6AG1221-1BF32-2XB0</b>	<b>6AG1221-1BF32-4XB0</b>	<b>6AG1221-1BH32-2XB0</b>	<b>6AG1221-1BH32-4XB0</b>
Based on	<b>6ES7221-1BF32-0XB0</b> SIPLUS S7-1200 SM 1221 8DI	<b>6ES7221-1BF32-0XB0</b> SIPLUS S7-1200 SM 1221 8DI	<b>6ES7221-1BH32-0XB0</b> SIPLUS S7-1200 SM 1221 16DI	<b>6ES7221-1BH32-0XB0</b> SIPLUS S7-1200 SM 1221 16DI
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes	Yes	Yes	Yes
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

# SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS digital modules

## SIPLUS SB 1221 digital input modules

### Overview



- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS SB 1221 digital input signal board

(extended temperature range and exposure to media)

4 inputs, 5 V DC, 200 kHz, sourcing input

**6AG1221-3AD30-5XB0**

4 inputs, 24 V DC, 200 kHz, sourcing input

**6AG1221-3BD30-5XB0**

#### Accessories

See SIMATIC S7-1200 digital input SB 1221, page 3/51

### Technical specifications

Article number	<b>6AG1221-3AD30-5XB0</b>	<b>6AG1221-3BD30-5XB0</b>
Based on	<b>6ES7221-3AD30-0XB0</b> SIPLUS S7-1200 SB 1221 4DI 5VDC	<b>6ES7221-3BD30-0XB0</b> SIPLUS S7-1200 SB 1221 4DI 24VDC
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

**Technical specifications**

Article number	<b>6AG1221-3AD30-5XB0</b>	<b>6AG1221-3BD30-5XB0</b>
Based on	<b>6ES7221-3AD30-0XB0</b> SIPLUS S7-1200 SB 1221 4DI 5VDC	<b>6ES7221-3BD30-0XB0</b> SIPLUS S7-1200 SB 1221 4DI 24VDC
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**SIMATIC S7-1200 Basic Controllers**

I/O modules

SIPLUS digital modules

**SIPLUS SM 1222 digital output modules****Overview**

- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS SM 1222 digital output signal module**

(Extended temperature range and exposure to media)

8 outputs, 24 V DC; 0.5 A, 5 W, isolated

- For areas with exceptional exposure to media (conformal coating)
- -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%

**6AG1222-1BF32-4XB0****6AG1222-1BF32-2XB0**

16 outputs, 24 V DC; 0.5 A, 5 W, isolated

- For areas with exceptional exposure to media (conformal coating)
- -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%

**6AG1222-1BH32-4XB0****6AG1222-1BH32-2XB0**

8 outputs, 5 ... 30 V DC / 5 ... 250 V AC, relay 2 A, 30 W DC/200 W AC

- For areas with exceptional exposure to media (conformal coating)
- -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%

**6AG1222-1HF32-4XB0****6AG1222-1HF32-2XB0**

8 relay outputs, changeover contact, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC

- For areas with exceptional exposure to media (conformal coating)
- -40 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%

**6AG1222-1XF32-4XB0****6AG1222-1XF32-2XB0**

16 outputs, 5 ... 30 V DC / 5 ... 250 V AC, relay 2 A, 30 W DC/200 W AC

- For areas with exceptional exposure to media (conformal coating)
- -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%

**6AG1222-1HH32-4XB0****6AG1222-1HH32-2XB0****Accessories**

See SIMATIC S7-1200 digital output SM 1222, page 3/53



### Technical specifications

Article number	6AG1222-1BF32-2XB0	6AG1222-1BF32-4XB0	6AG1222-1BH32-2XB0	6AG1222-1BH32-4XB0
Based on	6ES7222-1BF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ	6ES7222-1BF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ	6ES7222-1BH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ	6ES7222-1BH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

## SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS digital modules

## SIPLUS SM 1222 digital output modules

## Technical specifications

Article number	6AG1222-1BF32-2XB0	6AG1222-1BF32-4XB0	6AG1222-1BH32-2XB0	6AG1222-1BH32-4XB0
Based on	6ES7222-1BF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ	6ES7222-1BF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ	6ES7222-1BH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ	6ES7222-1BH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1222-1HF32-2XB0	6AG1222-1HF32-4XB0	6AG1222-1XF32-2XB0	6AG1222-1XF32-4XB0
Based on	6ES7222-1HF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1HF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1XF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1XF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

### Technical specifications

Article number	6AG1222-1HF32-2XB0	6AG1222-1HF32-4XB0	6AG1222-1XF32-2XB0	6AG1222-1XF32-4XB0
Based on	6ES7222-1HF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1HF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1XF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1XF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

# SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS digital modules

## SIPLUS SM 1222 digital output modules

### Technical specifications

Article number	6AG1222-1HH32-2XB0	6AG1222-1HH32-4XB0
Based on	6ES7222-1HH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ RLY	6ES7222-1HH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ RLY
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> <li>At cold restart, min.</li> </ul>	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C 60 °C; = Tmax 0 °C
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

**Overview**

- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- Can be plugged directly into the CPU
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Ordering data****Article No.****SIPLUS SB 1222 digital output signal board**

(Extended temperature range and exposure to media)

4 outputs, 5 V DC, 0.1 A, 200 kHz

**6AG1222-1AD30-5XB0**

4 outputs, 24 V DC, 0.1 A, 200 kHz

**6AG1222-1BD30-5XB0**

**Accessories**

See SIMATIC S7-1200 digital output module SB 1222, page 3/56

**SIMATIC S7-1200 Basic Controllers**

I/O modules

SIPLUS digital modules

**SIPLUS SB 1222 digital output modules****Technical specifications**

Article number	<b>6AG1222-1AD30-5XB0</b>	<b>6AG1222-1BD30-5XB0</b>
Based on	<b>6ES7222-1AD30-0XB0</b>	<b>6ES7222-1BD30-0XB0</b>
	SIPLUS S7-1200 SB 1222 4DQ 5VDC	SIPLUS S7-1200 SB 1222 4DQ 24VDC
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS SM 1223 digital input/output signal module**

(Extended temperature range and exposure to media)

8 inputs, 24 V DC,  
IEC type 1 sinking input;  
8 x 24 V DC transistor outputs,  
0.5 A, 5 W

- For areas with exceptional exposure to media (conformal coating)
- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1223-1BH32-4XB0****6AG1223-1BH32-2XB0**

16 inputs, 24 V DC,  
IEC type 1 sinking input;  
16 x 24 V DC transistor outputs,  
0.5 A, 5 W

- For areas with exceptional exposure to media (conformal coating)
- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1223-1BL32-4XB0****6AG1223-1BL32-2XB0**

8 inputs, 24 V DC,  
IEC type 1 sinking input;  
8 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC

- For areas with exceptional exposure to media (conformal coating)
- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1223-1PH32-4XB0****6AG1223-1PH32-2XB0**

16 inputs, 24 V DC,  
IEC type 1 sinking input;  
16 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC

- For areas with exceptional exposure to media (conformal coating)
- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1223-1PL32-4XB0****6AG1223-1PL32-2XB0**

8 inputs, 120/230 V AC;  
8 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC

- For areas with exceptional exposure to media (conformal coating)

**6AG1223-1QH32-4XB0****6AG1223-1QH32-2XB0**

-40 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%

**Accessories**

See SIMATIC S7-1200 SM 1223 digital input/output modules, page 3/58

## SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS digital modules

## SIPLUS SM 1223 digital input/output modules

## Technical specifications

Article number	6AG1223-1BH32-2XB0	6AG1223-1BH32-4XB0	6AG1223-1PH32-2XB0	6AG1223-1PH32-4XB0
Based on	6ES7223-1BH32-0XB0	6ES7223-1BH32-0XB0	6ES7223-1PH32-0XB0	6ES7223-1PH32-0XB0
	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes	Yes	Yes	Yes
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *



### Technical specifications

Article number	6AG1223-1BH32-2XB0	6AG1223-1BH32-4XB0	6AG1223-1PH32-2XB0	6AG1223-1PH32-4XB0
Based on	6ES7223-1BH32-0XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6ES7223-1BH32-0XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6ES7223-1PH32-0XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	6ES7223-1PH32-0XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
<b>Usage in industrial process technology</b>	<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>
<b>Remark</b>	<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>
<b>Conformal coating</b>	<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>
Article number	6AG1223-1PL32-2XB0	6AG1223-1PL32-4XB0	6AG1223-1BL32-2XB0	6AG1223-1BL32-4XB0
Based on	6ES7223-1PL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6ES7223-1PL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6ES7223-1BL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ	6ES7223-1BL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m	2 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
• Resistant to commercially available coolants and lubricants	Yes	Yes	Yes	Yes

# SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS digital modules

## SIPLUS SM 1223 digital input/output modules

### Technical specifications

Article number	6AG1223-1PL32-2XB0	6AG1223-1PL32-4XB0	6AG1223-1BL32-2XB0	6AG1223-1BL32-4XB0
Based on	6ES7223-1PL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6ES7223-1PL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6ES7223-1BL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ	6ES7223-1BL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**Technical specifications**

Article number	<b>6AG1223-1QH32-2XB0</b>	<b>6AG1223-1QH32-4XB0</b>
Based on	<b>6ES7223-1QH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY	<b>6ES7223-1QH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C 60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

## SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS digital modules

### SIPLUS SB 1223 digital input/output modules

#### Overview



- Digital inputs and outputs as supplement to the integral I/O of the SIPLUS S7-1200 CPUs
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### Digital input/output SIPLUS signal board SB 1223

(Extended temperature range and exposure to media)

2 inputs, 24 V DC,  
IEC type 1 sinking input;  
2 x 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC at up to  
30 kHz

- Suitable for areas with extreme exposure to media (conformal coating)
- Ambient temperature  
-25 ... +55 °C

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

##### Accessories

**6AG1223-0BD30-4XB0**

**6AG1223-0BD30-5XB0**

**6AG1223-3AD30-5XB0**

**6AG1223-3BD30-5XB0**

See SIMATIC S7-1200 digital input/output SB 1223, page 3/62

#### Technical specifications

Article number	<b>6AG1223-0BD30-4XB0</b>	<b>6AG1223-0BD30-5XB0</b>	<b>6AG1223-3AD30-5XB0</b>	<b>6AG1223-3BD30-5XB0</b>
Based on	<b>6ES7223-0BD30-0XB0</b> SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	<b>6ES7223-0BD30-0XB0</b> SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	<b>6ES7223-3AD30-0XB0</b> SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	<b>6ES7223-3BD30-0XB0</b> SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-20 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost permitted (no commissioning in bedewed state)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

### Technical specifications

Article number	6AG1223-0BD30-4XB0	6AG1223-0BD30-5XB0	6AG1223-3AD30-5XB0	6AG1223-3BD30-5XB0
Based on	6ES7223-0BD30-0XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6ES7223-0BD30-0XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6ES7223-3AD30-0XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	6ES7223-3BD30-0XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## SIMATIC S7-1200 Basic Controllers

I/O modules

Analog modules

### SM 1231 analog input modules

#### Overview



- Analog inputs for SIMATIC S7-1200
- Extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks

#### Ordering data

#### Article No.

##### SM 1231 analog input signal module

4 analog inputs,  $\pm 10V$ ,  $\pm 5V$ ,  $\pm 2.5V$ , or 0 ... 20 mA, 16 bits

**6ES7231-5ND32-0XB0**

4 analog inputs,  $\pm 10V$ ,  $\pm 5V$ ,  $\pm 2.5V$ , or 0 ... 20 mA, 12 bits + sign

**6ES7231-4HD32-0XB0**

8 analog inputs,  $\pm 10V$ ,  $\pm 5V$ ,  $\pm 2.5V$ , or 0 ... 20 mA, 12 bits + sign

**6ES7231-4HF32-0XB0**

##### Extension cable for two-tier configuration

**6ES7290-6AA30-0XA0**

For connecting digital/analog signal modules; length 2 m

##### Terminal block (spare part)

For 6ES7231-5ND32-0XB0, 6ES7231-4HD32-0XB0, 6ES7231-4HF32-0XB0

- 7-pin, gold-plated; 4 units
- Screw-type system
- Push-in system

**6ES7292-1BG30-0XA0**  
**6ES7292-2BG30-0XA0**

##### Front flap set (spare part)

For modules with a width of 45 mm

**6ES7291-1BA30-0XA0**

#### Technical specifications

Article number	<b>6ES7231-4HD32-0XB0</b>	<b>6ES7231-4HF32-0XB0</b>	<b>6ES7231-5ND32-0XB0</b>
	Analog Input SM 1231, 4AI	Analog Input SM 1231, 8AI	Analog Input SM 1231, 4AI 16bit
<b>General information</b>			
Product type designation	SM 1231, AI 4x13 bit	SM 1231, AI 8x13 bit	SM 1231, AI 4x16 bit
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
<b>Input current</b>			
Current consumption, typ.	45 mA	45 mA	65 mA
from backplane bus 5 V DC, typ.	80 mA	90 mA	80 mA
<b>Analog inputs</b>			
Number of analog inputs	4; Current or voltage differential inputs	8; Current or voltage differential inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V	35 V	$\pm 35 V$
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA
Cycle time (all channels) max.	625 $\mu s$	625 $\mu s$	100 $\mu s$
<b>Input ranges</b>			
• Voltage	Yes; $\pm 10V$ , $\pm 5V$ , $\pm 2.5V$	Yes; $\pm 10V$ , $\pm 5V$ , $\pm 2.5V$	Yes; $\pm 10V$ , $\pm 5V$ , $\pm 2.5V$ or $\pm 1.25V$
• Current	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No	No	No
• Resistance thermometer	No	No	No
• Resistance	No	Yes	No
<b>Input ranges (rated values), voltages</b>			
• -1.25 V to +1.25 V			Yes
• -10 V to +10 V	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes	Yes
• -5 V to +5 V	Yes	Yes	Yes
<b>Input ranges (rated values), currents</b>			
• 0 to 20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
<b>Thermocouple (TC)</b>			
<b>Temperature compensation</b>			
- parameterizable		No	

## Technical specifications

Article number	6ES7231-4HD32-0XB0	6ES7231-4HF32-0XB0	6ES7231-5ND32-0XB0
	Analog Input SM 1231, 4AI	Analog Input SM 1231, 8AI	Analog Input SM 1231, 4AI 16bit
<b>Analog value generation for the inputs</b>			
<b>Integration and conversion time/resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	12 bit; + sign	12 bit; + sign	15 bit; + sign
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency $f_1$ in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
<b>Smoothing of measured values</b>			
• parameterizable	Yes	Yes	Yes
<b>Errors/accuracies</b>			
Temperature error (relative to input range), (+/-)	25 °C $\pm$ 0.1%, to 55 °C $\pm$ 0.2% total measurement range	25 °C $\pm$ 0.1%, to 55 °C $\pm$ 0.2% total measurement range	25 °C $\pm$ 0.1% / $\pm$ 0.3% total measurement range
<b>Basic error limit (operational limit at 25 °C)</b>			
• Voltage, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
• Current, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>			
• Common mode voltage, max.	12 V	12 V	12 V
<b>Interrupts/diagnostics/status information</b>			
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnoses</b>			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire-break	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• for status of the inputs	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
cULus	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes
KC approval	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes

**SIMATIC S7-1200 Basic Controllers**

I/O modules

Analog modules

**SM 1231 analog input modules****Technical specifications**

Article number	<b>6ES7231-4HD32-0XB0</b>	<b>6ES7231-4HF32-0XB0</b>	<b>6ES7231-5ND32-0XB0</b>
	Analog Input SM 1231, 4AI	Analog Input SM 1231, 8AI	Analog Input SM 1231, 4AI 16bit
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
<b>Pollutant concentrations</b>			
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>			
required front connector	Yes	Yes	Yes
<b>Mechanics/material</b>			
Enclosure material (front)			
• Plastic	Yes	Yes	Yes
<b>Dimensions</b>			
Width	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	180 g	180 g	180 g

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**Overview**

- Analog input for SIMATIC S7-1200
- Extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks
- Can be plugged directly into the CPU

**Ordering data****Article No.****SB 1231 signal board analog input module**

1 analog input,  $\pm 10$  V with 12 bits or 0... 20 mA with 11 bits

**6ES7231-4HA30-0XB0****Terminal block (spare part)**

for signal board  
with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0****Technical specifications**

Article number	<b>6ES7231-4HA30-0XB0</b> Signal Board SB 1231, 1 AI
<b>General information</b>	
Product type designation	SB 1231, AI 1x12 bit
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
from backplane bus 5 V DC, typ.	55 mA
<b>Analog inputs</b>	
Number of analog inputs	1; Current or voltage differential inputs
permissible input voltage for current input (destruction limit), max.	$\pm 35$ V
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for voltage input (destruction limit), max.	40 mA
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	156.25 $\mu$ s; 400 Hz suppression
<b>Input ranges</b>	
• Voltage	Yes; $\pm 10$ V, $\pm 5$ V, $\pm 2.5$ V
• Current	Yes; 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), voltages</b>	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	11 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
<b>Smoothing of measured values</b>	
• parameterizable	Yes

Article number	<b>6ES7231-4HA30-0XB0</b> Signal Board SB 1231, 1 AI
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C $\pm 0.3\%$ , to 55 °C $\pm 0.6\%$ total measurement range
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Wire-break	No
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C
<b>Pollutant concentrations</b>	
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	35 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

Analog modules

### SM 1232 analog output modules

#### Overview



- Analog outputs for SIMATIC S7-1200
- Extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

#### Ordering data

#### Article No.

##### SM 1232 analog output signal module

2 analog outputs,  $\pm 10$  V with 14 bits or 0 ... 20 mA with 13 bits

**6ES7232-4HB32-0XB0**

4 analog outputs,  $\pm 10$  V with 14 bits or 0 ... 20 mA with 13 bits

**6ES7232-4HD32-0XB0**

##### Terminal block (spare part)

For 6ES7232-4HB32-0XB0, 6ES7232-4HD32-0XB0

- 7-pin, gold-plated; 4 units
  - Screw-type system
  - Push-in system

**6ES7292-1BG30-0XA0**

**6ES7292-2BG30-0XA0**

##### Extension cable for two-tier configuration

For connecting digital/analog signal modules; length 2 m

**6ES7290-6AA30-0XA0**

##### Front flap set (spare part)

For modules with a width of 45 mm

**6ES7291-1BA30-0XA0**

#### Technical specifications

Article number	<b>6ES7232-4HB32-0XB0</b> Analog Output SM 1232, 2AO	<b>6ES7232-4HD32-0XB0</b> Analog Output SM 1232, 4AO
<b>General information</b>		
Product type designation	SM 1232, AQ 2x14 bit	SM 1232, AQ 4x14 bit
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
<b>Input current</b>		
Current consumption, typ.	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Analog outputs</b>		
Number of analog outputs	2; Current or voltage	4; Current or voltage
<b>Output ranges, voltage</b>		
• -10 V to +10 V	Yes	Yes
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	Yes
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 000 $\Omega$	1 000 $\Omega$
• with current outputs, max.	600 $\Omega$	600 $\Omega$
<b>Cable length</b>		
• shielded, max.	100 m; shielded, twisted pair	100 m; shielded, twisted pair
<b>Analog value generation for the outputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit	14 bit; Voltage: 14 bit; Current : 13 bit
<b>Errors/accuracies</b>		
Temperature error (relative to output range), (+/-)	25 °C $\pm 0.3\%$ , to 55 °C $\pm 0.6\%$ total measurement range	25 °C $\pm 0.3\%$ , to 55 °C $\pm 0.6\%$ total measurement range
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>		
• Common mode voltage, max.	12 V	12 V

## Technical specifications

Article number	6ES7232-4HB32-0XB0	6ES7232-4HD32-0XB0
	Analog Output SM 1232, 2AO	Analog Output SM 1232, 4AO
<b>Interrupts/diagnostics/status information</b>		
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnoses</b>		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes	Yes
• Short-circuit	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the outputs	Yes	Yes
• for maintenance	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Pollutant concentrations</b>		
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Enclosure material (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	180 g	180 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

Analog modules

### SB 1232 analog output modules

#### Overview



- Analog output for SIMATIC S7-1200
- Can be plugged directly into the CPU

#### Ordering data

#### Article No.

##### SB 1232 analog output signal board

1 analog output,  $\pm 10$  V with 12 bits or 0 ... 20 mA with 11 bits

**6ES7232-4HA30-0XB0**

##### Terminal block (spare part)

for signal board

with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0**

#### Technical specifications

Article number	<b>6ES7232-4HA30-0XB0</b> Signal Board SB 1232, 1 AO
<b>General information</b>	
Product type designation	SB 1232, AQ 1x12 bit
<b>Input current</b>	
from backplane bus 5 V DC, typ.	15 mA
<b>Output voltage</b>	
<b>Power supply to the transmitters</b>	
• Supply current, max.	25 mA
<b>Analog inputs</b>	
Number of analog inputs	0
<b>Analog outputs</b>	
Number of analog outputs	1
Cycle time (all channels) max.	Voltage: 300 $\mu$ S (R), 750 $\mu$ S (1 uF) Current: 600 ms (1 mH); 2 ms (10 mH)
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 000 $\Omega$
• with current outputs, max.	600 $\Omega$
<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog value generation for the outputs</b>	
Conversion principle	Differential
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	12 bit
<b>Errors/accuracies</b>	
Temperature error (relative to output range), (+/-)	25 °C $\pm 0.5\%$ , to 55 °C $\pm 1\%$

Article number	<b>6ES7232-4HA30-0XB0</b> Signal Board SB 1232, 1 AO
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• for status of the outputs	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C
<b>Pollutant concentrations</b>	
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	40 g

## Overview



- Analog inputs and outputs for the SIMATIC S7-1200
- Extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks

## Ordering data

## Article No.

**SM 1234 analog input/output signal module**

4 analog inputs,  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V, or 0 ... 20 mA, 12 bits + sign;  
2 analog outputs,  $\pm 10$  V with 14 bits or 0 ... 20 mA with 13 bits

**6ES7234-4HE32-0XB0****Terminal block (spare part)**

For 6ES7234-4HE32-0XB0

- 7-pin, gold-plated; 4 units
- Screw-type system
- Push-in system

**6ES7292-1BG30-0XA0**  
**6ES7292-2BG30-0XA0****Extension cable for two-tier configuration**

For connecting digital/analog signal modules; length 2 m

**6ES7290-6AA30-0XA0****Front flap set (spare part)**

For modules with a width of 45 mm

**6ES7291-1BA30-0XA0**

## Technical specifications

Article number	<b>6ES7234-4HE32-0XB0</b>
	Analog I/O SM 1234, 4AI/2AO
<b>General information</b>	
Product type designation	SM 1234, AI 4x13 bit/AQ 2x14 bit
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
<b>Analog inputs</b>	
Number of analog inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	625 $\mu$ s
<b>Input ranges</b>	
• Voltage	Yes; $\pm 10$ V, $\pm 5$ V, $\pm 2.5$ V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
<b>Input ranges (rated values), voltages</b>	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes

Article number	<b>6ES7234-4HE32-0XB0</b>
	Analog I/O SM 1234, 4AI/2AO
<b>Analog outputs</b>	
Number of analog outputs	2; Current or voltage
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 000 $\Omega$
• with current outputs, max.	600 $\Omega$
<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	12 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
<b>Smoothing of measured values</b>	
• parameterizable	Yes
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit

# SIMATIC S7-1200 Basic Controllers

I/O modules

Analog modules

## SM 1234 analog input/output modules

### Technical specifications

Article number	<b>6ES7234-4HE32-0XB0</b> Analog I/O SM 1234, 4AI/2AO
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>	
• Common mode voltage, max.	12 V
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for status of the outputs	Yes
• for maintenance	Yes
<b>Potential separation analog outputs</b>	
• between the channels and the power supply of the electronics	No

Article number	<b>6ES7234-4HE32-0XB0</b> Analog I/O SM 1234, 4AI/2AO
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C
<b>Pollutant concentrations</b>	
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	220 g

**Overview**

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level ( $\pm 80$  mV)
- Can easily be retrofitted to existing plant

**Ordering data**

Ordering data	Article No.	Article No.
<b>SM 1231 thermocouple module</b>		<b>Accessories</b>
4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, S, T, R, E, N	<b>6ES7231-5QD32-0XB0</b>	<b>Terminal block (spare part)</b>
8 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	<b>6ES7231-5QF32-0XB0</b>	For 6ES7231-5QD32-0XB0, 6ES7231-5QF32-0XB0
		<ul style="list-style-type: none"> <li>• 7-pin, gold-plated; 4 units</li> <li>- Screw-type system</li> <li>- Push-in system</li> </ul>
		<b>Extension cable for two-tier configuration</b>
		For connecting digital/analog signal modules; length 2 m
		<b>Front flap set (spare part)</b>
		For modules with a width of 45 mm
		<b>6ES7292-1BG30-0XA0</b>
		<b>6ES7292-2BG30-0XA0</b>
		<b>6ES7290-6AA30-0XA0</b>
		<b>6ES7291-1BA30-0XA0</b>

**Technical specifications**

Article number	<b>6ES7231-5QD32-0XB0</b>	<b>6ES7231-5QF32-0XB0</b>
	S7-1200, analog Input SM 1231 TC, 4 AI	S7-1200, analog Input SM 1231 TC, 8 AI
<b>General information</b>		
Product type designation	SM 1231, AI 4x16 bit TC	SM 1231, AI 8x16 bit TC
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
<b>Input current</b>		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Analog inputs</b>		
Number of analog inputs	4; Thermocouples	8; Thermocouples
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b>		
• Voltage	Yes	Yes
• Current	No	No
• Thermocouple	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: $\pm 80$ mV	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: $\pm 80$ mV
• Resistance thermometer	No	No
• Resistance	No	No
<b>Input ranges (rated values), voltages</b>		
• -80 mV to +80 mV	Yes	Yes
<b>Input ranges (rated values), thermocouples</b>		
• Type B	Yes	Yes
• Type C	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
• Type T	Yes	Yes
• Type TXK/TXK(L) to GOST	Yes	Yes
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- parameterizable	No	No

# SIMATIC S7-1200 Basic Controllers

I/O modules

Analog modules

## SM 1231 thermocouple module

### Technical specifications

Article number	6ES7231-5QD32-0XB0	6ES7231-5QF32-0XB0
	S7-1200, analog Input SM 1231 TC, 4 AI	S7-1200, analog Input SM 1231 TC, 8 AI
<b>Analog value generation for the inputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> </ul>	15 bit; + sign	15 bit; + sign
<ul style="list-style-type: none"> <li>Integration time, parameterizable</li> </ul>	No	No
<ul style="list-style-type: none"> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
<b>Smoothing of measured values</b>		
<ul style="list-style-type: none"> <li>parameterizable</li> </ul>	Yes	Yes
<b>Errors/accuracies</b>		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %	0.5 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>		
<ul style="list-style-type: none"> <li>Common mode interference, min.</li> </ul>	120 dB	120 dB
<b>Interrupts/diagnostics/status information</b>		
Alarms	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out
<b>Alarms</b>		
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> </ul>	Yes	Yes
<b>Diagnoses</b>		
<ul style="list-style-type: none"> <li>Monitoring the supply voltage</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>Wire-break</li> </ul>	Yes	Yes
<b>Diagnostics indication LED</b>		
<ul style="list-style-type: none"> <li>for status of the inputs</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>for maintenance</li> </ul>	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>min.</li> </ul>	-20 °C	-20 °C
<ul style="list-style-type: none"> <li>max.</li> </ul>	60 °C	60 °C
<b>Pollutant concentrations</b>		
<ul style="list-style-type: none"> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Enclosure material (front)		
<ul style="list-style-type: none"> <li>Plastic</li> </ul>	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	180 g	220 g



**Overview**

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common thermocouple types can be used
- Also for the measurement of analog signals with a low level ( $\pm 80$  mV)
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

**Ordering data****Article No.****SB 1231 thermocouple signal board****6ES7231-5QA30-0XB0**

1 input +/- 80 mV,  
resolution 15 bits + sign,  
thermocouples type J, K

**Accessories****Terminal block (spare part)**

for signal board

with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0****Technical specifications**

Article number	<b>6ES7231-5QA30-0XB0</b> Signal Board SB 1231 TC, 1 AI
<b>General information</b>	
Product type designation	SB 1231, AI 1x16 bit TC
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
<b>Analog inputs</b>	
Number of analog inputs	1; Thermocouples
permissible input voltage for current input (destruction limit), max.	$\pm 35$ V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b>	
• Voltage	Yes
• Current	No
• Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: $\pm 80$ mV
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), voltages</b>	
• -80 mV to +80 mV	Yes
<b>Input ranges (rated values), thermocouples</b>	
• Type J	Yes
• Type K	Yes
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
- parameterizable	No
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
<b>Smoothing of measured values</b>	
• parameterizable	Yes

Article number	<b>6ES7231-5QA30-0XB0</b> Signal Board SB 1231 TC, 1 AI
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C $\pm 0.1\%$ , to 55 °C $\pm 0.2\%$ total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>	
• Common mode interference, min.	120 dB
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes; Can be read out
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Wire-break	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C
<b>Pollutant concentrations</b>	
• SO2 at RH < 60% without condensation	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	35 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

Analog modules

### SM 1231 RTD signal module

#### Overview

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature sensors can be used
- Can easily be retrofitted to existing installation

#### Ordering data

Ordering data	Article No.	Article No.
<b>SM 1231 RTD signal module</b> 4 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms, resolution 15 bits + sign  8 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms, resolution 15 bits + sign	<b>6ES7231-5PD32-0XB0</b>  <b>6ES7231-5PF32-0XB0</b>	<b>Accessories</b> <b>Terminal block (spare part)</b> For 6ES7231-5PD32-0XB0 <ul style="list-style-type: none"> <li>• With 7 screws, gold-plated; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> </ul> For 6ES7231-5PF32-0XB0 <ul style="list-style-type: none"> <li>• With 11 screws, gold-plated; 4 units               <ul style="list-style-type: none"> <li>- Screw-type system</li> <li>- Push-in system</li> </ul> </li> </ul> <b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m <b>Front flap set (spare part)</b> For modules with a width of 45 mm For modules with a width of 70 mm
		<b>6ES7292-1BG30-0XA0</b>  <b>6ES7292-1BL30-0XA0</b>  <b>6ES7290-6AA30-0XA0</b>  <b>6ES7291-1BA30-0XA0</b> <b>6ES7291-1BB30-0XA0</b>

#### Technical specifications

Article number	6ES7231-5PD32-0XB0	6ES7231-5PF32-0XB0
	S7-1200, analog Input SM 1231 RTD, 4 AI	S7-1200, analog Input SM 1231 RTD, 8 AI
<b>General information</b>		
Product type designation	SM 1231, AI 4x16 bit RTD	SM 1231, AI 8x16 bit RTD
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
<b>Input current</b>		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Analog inputs</b>		
Number of analog inputs	4; Resistance thermometer	8; Resistance thermometer
permissible input voltage for voltage input (destruction limit), max.	±35 V	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b>		
• Voltage	No	No
• Current	No	No
• Thermocouple	No	No
• Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω	Yes; 150 Ω, 300 Ω, 600 Ω

## Technical specifications

Article number	6ES7231-5PD32-0XB0	6ES7231-5PF32-0XB0
	S7-1200, analog Input SM 1231 RTD, 4 AI	S7-1200, analog Input SM 1231 RTD, 8 AI
<b>Input ranges (rated values), resistance thermometer</b>		
• Cu 10	Yes	Yes
• Ni 100	Yes	Yes
• Ni 1000	Yes	Yes
• LG-Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Ni 200	Yes	Yes
• Ni 500	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes
<b>Input ranges (rated values), resistors</b>		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- parameterizable	No	No
<b>Analog value generation for the inputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
<b>Errors/accuracies</b>		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>		
• Common mode interference, min.	120 dB	120 dB
<b>Interrupts/diagnostics/status information</b>		
Alarms	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnoses</b>		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes

**SIMATIC S7-1200 Basic Controllers**

I/O modules

Analog modules

**SM 1231 RTD signal module****Technical specifications**

Article number	<b>6ES7231-5PD32-0XB0</b>	<b>6ES7231-5PF32-0XB0</b>
	S7-1200, analog Input SM 1231 RTD, 4 AI	S7-1200, analog Input SM 1231 RTD, 8 AI
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Pollutant concentrations</b>		
• SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Enclosure material (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	70 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	220 g	220 g

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**Overview**

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance-type temperature sensors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

**Ordering data****Article No.****RTD signal board SB 1231****6ES7231-5PA30-0XB0**

1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign

**Accessories****Terminal block (spare part)**

for signal board  
with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0****Technical specifications**

Article number	<b>6ES7231-5PA30-0XB0</b> Signal Board SB 1231 RTD
<b>General information</b>	
Product type designation	SB 1231, AI 1x16 bit RTD
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
<b>Analog inputs</b>	
Number of analog inputs	1; Resistance thermometer
permissible input voltage for current input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b>	
• Voltage	Yes
• Current	No
• Thermocouple	No
• Resistance thermometer	Yes; Platinum (Pt)
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
<b>Input ranges (rated values), resistance thermometer</b>	
• Pt 100	Yes
• Pt 1000	Yes
• Pt 200	Yes
• Pt 500	Yes
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
- parameterizable	No
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz

Article number	<b>6ES7231-5PA30-0XB0</b> Signal Board SB 1231 RTD
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 = \text{interference frequency}</math></b>	
• Common mode interference, min.	120 dB
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes; Can be read out
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Wire-break	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C
<b>Pollutant concentrations</b>	
• SO2 at RH < 60% without condensation	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	35 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

Analog modules

### SM 1238 Energy Meter 480 V AC analog input modules

#### Overview

- Energy management based on SIMATIC S7-1200
- Data acquisition of electrical characteristics in 1 and 3-phase networks up to 480 V AC
- Direct connection of voltage inputs
- Current measurement performed by 1 A and 5 A current transformers
- Can be used in TN and TT networks
- Data backup of measurement data in the event of a power failure

#### Ordering data

#### Article No.

##### SM 1238 Energy Meter 480 V AC analog input

Energy measurement module for data acquisition in 1 and 3-phase networks (TN, TT) up to 480 V AC; current range: 1 A, 5 A; recording of voltage, current, phase angles, power ratings, energy values, frequencies; with channel diagnostics

6ES7238-5XA32-0XB0

##### Extension cable for two-tier configuration

For connecting digital/analog signal modules; length 2 m

6ES7290-6AA30-0XA0

##### Terminal block (spare part)

- For voltage input (top), 7-pin, tin-coated, coded in middle
  - Screw-type system
  - Push-in system

6ES7292-1AG40-0XA2  
6ES7292-2AG40-0XA2

For current input (bottom), 7-pin, tin-coated

- Screw-type system
- Push-in system

6ES7292-1AG30-0XA0  
6ES7292-2AG30-0XA0

##### Front flap set (spare part)

For modules with a width of 45 mm

6ES7291-1BA30-0XA0

#### Technical specifications

Article number	<b>6ES7238-5XA32-0XB0</b> SM 1238 Energy Meter 480V AC
<b>General information</b>	
Product type designation	SM 1238, AI energy meter 480 V AC
<b>Product function</b>	
• Voltage measurement	Yes
- with voltage transformer	Yes
• Current measurement	Yes
- without current transformer	No
- with current transformer	Yes
• Energy measurement	Yes
• Frequency measurement	Yes
• Power measurement	Yes
• Active power measurement	Yes
• Reactive power measurement	Yes
• I&M data	Yes; I&M 0
• Isochronous mode	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1
<b>Operating mode</b>	
• cyclic measurement	Yes
• acyclic measurement	Yes
• Acyclic measured value access	Yes
• Fixed measured value sets	Yes
• Freely definable measured value sets	No

Article number	<b>6ES7238-5XA32-0XB0</b> SM 1238 Energy Meter 480V AC
<b>Installation type/mounting</b>	
Mounting position	Horizontal, vertical
<b>Supply voltage</b>	
Design of the power supply	from CPU
Type of supply voltage	DC
<b>Input current</b>	
Current consumption, max.	180 mA
<b>Analog inputs</b>	
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
• Hardware interrupt	No
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED

## Technical specifications

Article number	<b>6ES7238-5XA32-0XB0</b> SM 1238 Energy Meter 480V AC
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
• Measuring procedure for voltage measurement	TRMS
• Measuring procedure for current measurement	TRMS
• Type of measured value acquisition	seamless
• Curve shape of voltage	Sinusoidal or distorted
• Buffering of measured variables	Yes
• Parameter length	74 byte
• Bandwidth of measured value acquisition	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz
<b>Measuring range</b>	
- Frequency measurement, min.	45 Hz
- Frequency measurement, max.	65 Hz
<b>Measuring inputs for voltage</b>	
- Measurable line voltage between phase and neutral conductor	277 V
- Measurable line voltage between the line conductors	480 V
- Measurable line voltage between phase and neutral conductor, min.	0 V
- Measurable line voltage between phase and neutral conductor, max.	293 V
- Measurable line voltage between the line conductors, min.	0 V
- Measurable line voltage between the line conductors, max.	508 V
- Internal resistance line conductor and neutral conductor	3.4 MΩ
- Power consumption per phase	20 mW
- Impulse voltage resistance 1,2/50μs	1 kV
- Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II; CAT III in case of guaranteed protection level of 1.5 kV
<b>Measuring inputs for current</b>	
- measurable relative current (AC), min.	1 %; Relative to the secondary rated current 5 A
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current 5 A
- Continuous current with AC, maximum permissible	5 A
- Apparent power consumption per phase for measuring range 5 A	0.6 V·A
- Rated value short-time withstand current restricted to 1 s	100 A
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal
- Surge strength	10 A; for 1 minute
- Zero point suppression	Parameterizable: 2 ... 250 mA, default 50 mA

Article number	<b>6ES7238-5XA32-0XB0</b> SM 1238 Energy Meter 480V AC
<b>Accuracy class according to IEC 61557-12</b>	
- Measured variable apparent power	0.5
- Measured variable active power	0.5
- Measured variable power factor	0.5
- Measured variable active energy	0.5
- Measured variable neutral current	0.5; calculated
- Measured variable phase angle	±1 °; not covered by IEC 61557-12
- Measured variable frequency	0.05
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes; 3 700V AC (type test) CAT III
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	165 g
<b>Data for selecting a current transformer</b>	
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual

# SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS analog modules

## SIPLUS SM 1231 analog input modules

### Overview



- Analog inputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS SM 1231 analog input signal module

(Extended temperature range and exposure to media)

Ambient temperature range  
0 ... +55 °C

4 analog inputs,  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V, or 0 ... 20 mA, 16-bit

**6AG1231-5ND32-4XB0**

4 analog inputs  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V, or 0 ... 20 mA; 12-bit + sign

**6AG1231-4HD32-4XB0**

8 analog inputs,  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V, or 0 ... 20 mA, 12-bit + sign

**6AG1231-4HF32-4XB0**

#### Accessories

See SIMATIC S7-1200 analog input SM 1231 page 3/82

### Technical specifications

Article number	<b>6AG1231-4HD32-4XB0</b>	<b>6AG1231-4HF32-4XB0</b>	<b>6AG1231-5ND32-4XB0</b>
Based on	<b>6ES7231-4HD32-0XB0</b>	<b>6ES7231-4HF32-0XB0</b>	<b>6ES7231-5ND32-0XB0</b>
	SIPLUS S7-1200 SM 1231 4AI 13Bit	SIPLUS S7-1200 SM 1231 8AI 13Bit	SIPLUS S7-1200 SM 1231 4AI 16Bit
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)



## Technical specifications

Article number	6AG1231-4HD32-4XB0	6AG1231-4HF32-4XB0	6AG1231-5ND32-4XB0
Based on	6ES7231-4HD32-0XB0	6ES7231-4HF32-0XB0	6ES7231-5ND32-0XB0
	SIPLUS S7-1200 SM 1231 4AI 13Bit	SIPLUS S7-1200 SM 1231 8AI 13Bit	SIPLUS S7-1200 SM 1231 4AI 16Bit
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**SIMATIC S7-1200 Basic Controllers**

I/O modules

SIPLUS analog modules

**SIPLUS SM 1232 analog output modules****Overview**

- Analog outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the outputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS SM 1232 analog output signal module**

(Extended temperature range and exposure to media)

Ambient temperature range  
-20 ... +60 °C

2 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit

**6AG1232-4HB32-4XB0**

4 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit

**6AG1232-4HD32-4XB0**

Ambient temperature range  
-40 ... +70 °C

4 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit

**6AG1232-4HD32-2XB0****Accessories**

See SIMATIC S7-1200 analog output SM 1232 page 3/86

**Technical specifications**

Article number	<b>6AG1232-4HB32-4XB0</b>	<b>6AG1232-4HD32-2XB0</b>	<b>6AG1232-4HD32-4XB0</b>
Based on	<b>6ES7232-4HB32-0XB0</b>	<b>6ES7232-4HD32-0XB0</b>	<b>6ES7232-4HD32-0XB0</b>
	SIPLUS S7-1200 SM 1232 2AQ 13Bit	SIPLUS S7-1200 SM 1232 4AQ 14Bit	SIPLUS S7-1200 SM 1232 4AQ 14Bit
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

## Technical specifications

Article number	6AG1232-4HB32-4XB0	6AG1232-4HD32-2XB0	6AG1232-4HD32-4XB0
Based on	6ES7232-4HB32-0XB0	6ES7232-4HD32-0XB0	6ES7232-4HD32-0XB0
	SIPLUS S7-1200 SM 1232 2AQ 13Bit	SIPLUS S7-1200 SM 1232 4AQ 14Bit	SIPLUS S7-1200 SM 1232 4AQ 14Bit
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

# SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS analog modules

## SIPLUS SB 1232 analog output modules

### Overview



- Analog output for SIPLUS S7-1200
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS SB 1232 analog output signal board

(Extended temperature range and exposure to media)

Ambient temperature range  
-25 ... +55 °C

1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits

**6AG1232-4HA30-5XB0**

Ambient temperature range  
0 ... +55 °C

1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits

**6AG1232-4HA30-4XB0**

#### Accessories

See SIMATIC S7-1200  
analog output SB 1232  
page 3/88

### Technical specifications

Article number	6AG1232-4HA30-4XB0	6AG1232-4HA30-5XB0
Based on	6ES7232-4HA30-0XB0 SIPLUS S7-1200 SB 1232 1AQ	6ES7232-4HA30-0XB0 SIPLUS S7-1200 SB 1232 1AQ
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

**Technical specifications**

Article number	<b>6AG1232-4HA30-4XB0</b>	<b>6AG1232-4HA30-5XB0</b>
Based on	<b>6ES7232-4HA30-0XB0</b> SIPLUS S7-1200 SB 1232 1AQ	<b>6ES7232-4HA30-0XB0</b> SIPLUS S7-1200 SB 1232 1AQ
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS analog modules

### SIPLUS SM 1234 analog input/output modules

#### Overview



- Analog inputs and outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs and outputs can be controlled simultaneously

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

##### SIPLUS SM 1234 analog input/output signal module

(Extended temperature range and exposure to media)

Ambient temperature range  
-25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%

4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12-bit + sign;  
2 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit

Ambient temperature range  
0 ... +55 °C

4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12-bit + sign;  
2 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit

#### Accessories

#### Article No.

**6AG1234-4HE32-2XB0**

**6AG1234-4HE32-4XB0**

See SIMATIC S7-1200 analog input/output SM 1234 page 3/89

#### Technical specifications

Article number	<b>6AG1234-4HE32-2XB0</b>	<b>6AG1234-4HE32-4XB0</b>
Based on	<b>6ES7234-4HE32-0XB0</b> SIPLUS S7-1200 SM 1234 4AI/2AQ	<b>6ES7234-4HE32-0XB0</b> SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously used outputs 1, inputs 2 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

## Technical specifications

Article number	6AG1234-4HE32-2XB0	6AG1234-4HE32-4XB0
Based on	6ES7234-4HE32-0XB0 SIPLUS S7-1200 SM 1234 4AI/2AQ	6ES7234-4HE32-0XB0 SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

# SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS analog modules

## SIPLUS SM 1231 thermocouple module

### Overview

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level ( $\pm 80$  mV)
- Can easily be retrofitted to existing plant

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

### Ordering data

#### SIPLUS SM 1231 thermocouple module

(Extended temperature range and exposure to environmental substances)

Ambient temperature range  
-40 ... +70 °C

8 inputs +/- 80 mV, resolution 15-bit + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)

4 inputs +/- 80 mV, resolution 15-bit + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)

#### Accessories

### Article No.

**6AG1231-5QF32-4XB0**

**6AG1231-5QD32-4XB0**

See SIMATIC S7-1200 thermocouple module SM 1231, page 3/91

### Technical specifications

Article number	<b>6AG1231-5QF32-4XB0</b>	<b>6AG1231-5QD32-4XB0</b>
Based on	<b>6ES7231-5QF32-0XB0</b> SIPLUS S7-1200 SM 1231 8AI TC 16Bit	<b>6ES7231-5QD32-0XB0</b> SIPLUS S7-1200 SM 1231 4AI TC 16Bit
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *



**Technical specifications**

Article number	<b>6AG1231-5QF32-4XB0</b>	<b>6AG1231-5QD32-4XB0</b>
Based on	<b>6ES7231-5QF32-0XB0</b> SIPLUS S7-1200 SM 1231 8AI TC 16Bit	<b>6ES7231-5QD32-0XB0</b> SIPLUS S7-1200 SM 1231 4AI TC 16Bit
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**SIMATIC S7-1200 Basic Controllers**

I/O modules

SIPLUS analog modules

**SIPLUS RTD SM 1231 signal module****Overview**

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature detectors can be used
- Can easily be retrofitted to existing plant

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Ordering data****Article No.****SIPLUS RTD SM 1231 signal module**

(Extended temperature range and exposure to media)

4 inputs for resistance temperature detectors  
Pt10/50/100/200/500/1000,  
Ni100/120/200/500/1000,  
Cu10/50/100, LG-Ni1000;  
resistance 150/300/600 Ohm,  
resolution 15-bit + sign

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

**6AG1231-5PD32-4XB0****6AG1231-5PD32-2XB0**

8 inputs for resistance temperature detectors  
Pt10/50/100/200/500/1000,  
Ni100/120/200/500/1000,  
Cu10/50/100, LG-Ni1000;  
resistance 150/300/600 Ohm,  
resolution 15-bit + sign

- For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

**6AG1231-5PF32-4XB0****6AG1231-5PF32-2XB0****Accessories**

See SIMATIC S7-1200  
RTD SM 1231 signal module  
page 3/94

**Technical specifications**

Article number	<b>6AG1231-5PD32-4XB0</b>	<b>6AG1231-5PD32-2XB0</b>	<b>6AG1231-5PF32-4XB0</b>	<b>6AG1231-5PF32-2XB0</b>
Based on	<b>6ES7231-5PD32-0XB0</b> SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	<b>6ES7231-5PD32-0XB0</b> SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	<b>6ES7231-5PF32-0XB0</b> SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	<b>6ES7231-5PF32-0XB0</b> SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

## Technical specifications

Article number	6AG1231-5PD32-4XB0	6AG1231-5PD32-2XB0	6AG1231-5PF32-4XB0	6AG1231-5PF32-2XB0
Based on	6ES7231-5PD32-0XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6ES7231-5PD32-0XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6ES7231-5PF32-0XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	6ES7231-5PF32-0XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

# SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS analog modules

## SIPLUS RTD SB 1231 signal board

### Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance-type temperature detectors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

### Ordering data

#### SIPLUS RTD SB 1231 signal board

(Extended temperature range and exposure to media)

1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15-bit + sign

#### Accessories

### Article No.

**6AG1231-5PA30-5XB0**

See SIMATIC S7-1200 RTD SB 1231 signal board page 3/97

### Technical specifications

Article number	<b>6AG1231-5PA30-5XB0</b>
Based on	<b>6ES7231-5PA30-0XB0</b> SIPLUS S7-1200 SB 1231 1AI RTD
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1231-5PA30-5XB0</b>
Based on	<b>6ES7231-5PA30-0XB0</b> SIPLUS S7-1200 SB 1231 1AI RTD
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview



- Module for connecting up to 4 IO-Link devices according to IO Link Specification V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.2 and higher.

## Ordering data

## Article No.

**SM 1278 4xIO-Link-Master signal module****6ES7278-4BD32-0XB0**

for the connection of up to 4 IO-Link devices according to IO Link Specification V1.1

**Terminal block (spare part)**

- 7-pin, tin-coated; 4 units
- Screw-type system
- Push-in system

**6ES7292-1AG30-0XA0****6ES7292-2AG30-0XA0**

## Technical specifications

Article number	<b>6ES7278-4BD32-0XB0</b> S7-1200, SM1278, 4 X IO-Link Master
<b>General information</b>	
Product type designation	SM 1278 4xIO-Link master
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes

Article number	<b>6ES7278-4BD32-0XB0</b> S7-1200, SM1278, 4 X IO-Link Master
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C
<b>Connection method</b>	
required front connector	Yes
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	150 g

# SIMATIC S7-1200 Basic Controllers

I/O modules

Special modules

## SIPLUS SM 1278 4xIO-Link master

### Overview



- Module for connecting up to 4 IO-Link devices according to IO Link Specification V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.2 and higher.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS SM 1278 4xIO-Link master signal module

(Extended temperature range and exposure to media)

- For areas with extreme exposure to media (conformal coating)
- 25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%

**6AG1278-4BD32-4XB0**

**6AG1278-4BD32-2XB0**

### Technical specifications

Article number	<b>6AG1278-4BD32-2XB0</b>	<b>6AG1278-4BD32-4XB0</b>
Based on	<b>6ES7278-4BD32-0XB0</b> SIPLUS S7-1200 SM 1278 IO-Link Master	<b>6ES7278-4BD32-0XB0</b> SIPLUS S7-1200 SM 1278 IO-Link Master
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

**Technical specifications**

Article number	<b>6AG1278-4BD32-2XB0</b>	<b>6AG1278-4BD32-4XB0</b>
Based on	<b>6ES7278-4BD32-0XB0</b> SIPLUS S7-1200 SM 1278 IO-Link Master	<b>6ES7278-4BD32-0XB0</b> SIPLUS S7-1200 SM 1278 IO-Link Master
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## SIMATIC S7-1200 Basic Controllers

I/O modules

Special modules

### SIPLUS CMS1200 SM 1281 Condition Monitoring

#### Overview



SIPLUS CMS1200 SM 1281 Condition Monitoring forms part of SIMATIC S7-1200 and is used for the:

- Monitoring of motors, generators, pumps, fans, or other mechanical components
- Recording and analysis of vibrations
- Expansion capability of up to 7 modules

#### Ordering data

#### Article No.

##### SIPLUS CMS1200 SM 1281 Condition Monitoring

Module for SIMATIC S7-1200 for monitoring vibrations in mechanical components based on characteristic values and frequency-selective analysis functions.

6AT8007-1AA10-0AA0

##### Accessories

##### SIPLUS CMS1200, SM 1281 shield clamp set

For EMC-compliant connection of signal and encoder cables to SIPLUS CMS1200 SM 1281 Condition Monitoring.

6AT8007-1AA20-0AA0

##### SIPLUS VIB-SENSOR S01

Piezoelectric sensor for connection to SIPLUS CMS1200 SM 1281 Condition Monitoring.

6AT8002-4AB00

##### SIPLUS CABLE-MIL

For connection of VIB-SENSOR S01, S02 and S03 vibration sensor to SIPLUS CMS1200 SM 1281 Condition Monitoring.

SIPLUS CABLE-MIL-300;  
length 3 m

6AT8002-4AC03

SIPLUS CABLE-MIL-1000;  
length 10 m

6AT8002-4AC10

#### Technical specifications

Article number	<b>6AT8007-1AA10-0AA0</b> SM1281_Condition_Monitoring
<b>General information</b>	
Product type designation	SM1281
Product description	S7-1200 module for the monitoring of vibrations on mechanical components based on parameters and frequency-selective analysis functions
<b>Installation type/mounting</b>	
Mounting type	Rail or wall mounting
Mounting position	Horizontal, vertical
Recommended mounting position	Horizontal
<b>Supply voltage</b>	
Type of supply voltage	DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
Current consumption, typ.	200 mA
Current consumption, max.	250 mA
from backplane bus 5 V DC, typ.	80 mA
from backplane bus 5 V DC, max.	85 mA

Article number	<b>6AT8007-1AA10-0AA0</b> SM1281_Condition_Monitoring
<b>Power loss</b>	
Power loss, typ.	4.8 W
<b>Memory</b>	
Total memory capacity	1 Gbyte
<b>Hardware configuration</b>	
Design of hardware configuration	Modular, up to 7 modules per CPU
<b>Speed input</b>	
Number of speed inputs	1
<b>Input voltage</b>	
• 24 V DC digital	Yes
<b>Sensor input</b>	
Number of IEPE sensor inputs	4
Sampling frequency, max.	46 875 Hz
<b>Interfaces</b>	
Type of data transmission	Export of raw data as WAV file for further analysis (e.g. using CMS X-Tools) can be downloaded via browser/FTP, online data transfer to CMS X-Tools
Ethernet interface	Yes
<b>Protocols</b>	
Bus communication	Yes
<b>Web server</b>	
• HTTP	Yes



## Technical specifications

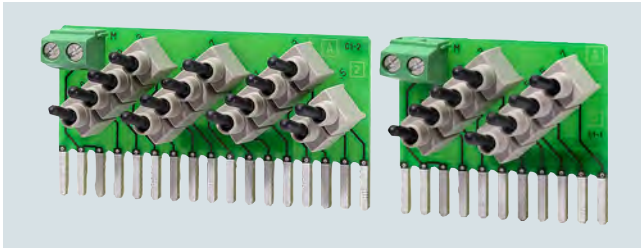
Article number	<b>6AT8007-1AA10-0AA0</b> SM1281_Condition_Monitoring
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
• Status indicator digital input (green)	No
<b>Integrated Functions</b>	
<b>Monitoring functions</b>	
• Monitoring of the sensor inputs	Yes; Cable break and short-circuit
• Vibration characteristic monitoring via RMS value of the vibration speed	Yes
• Vibration characteristic monitoring via RMS value of the vibration acceleration	Yes
• Vibration characteristic monitoring via diagnostic characteristic value	Yes
• Frequency-selective monitoring via vibration speed spectrum	Yes
• Frequency-selective monitoring via vibration acceleration spectrum	Yes
• Frequency-selective monitoring via envelope curve analysis	Yes
<b>Measuring functions</b>	
• Physical measuring principle	Vibration acceleration
<b>Measuring range</b>	
- Measurement range vibration frequency, min.	0.1 Hz
- Measurement range vibration frequency, max.	10 000 Hz

Article number	<b>6AT8007-1AA10-0AA0</b> SM1281_Condition_Monitoring
<b>Standards, approvals, certificates</b>	
Certificate of suitability	CE
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Fall height, max.	0.3 m; five times, in product package
<b>Software</b>	
Browser software required	Web browser Mozilla Firefox (ESR31) or Microsoft Internet Explorer (10/11)
<b>Connection method</b>	
required front connector	Yes
Design of electrical connection	Screw connection
<b>Mechanics/material</b>	
Material of housing	Plastic: polycarbonate, abbreviation: PC- GF 10 FR
<b>Dimensions</b>	
Width	70 mm
Height	112 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	260 g

**SIMATIC S7-1200 Basic Controllers**

I/O modules

Special modules

**Simulator Module SIM 1274****Overview**

- Simulator module for program testing during commissioning and ongoing operation
- Simulation of 8 or 14 inputs

**Ordering data****Article No.****Digital input simulator  
Simulator Module SIM 1274**with 8 input switches,  
for CPU 1211C/1212C**6ES7274-1XF30-0XA0**with 14 input switches,  
for CPU 1214C/1215C**6ES7274-1XH30-0XA0**with 14 input switches,  
for CPU 1217C**6ES7274-1XK30-0XA0****Analog input simulator  
Simulator Module SIM 1274**

2 potentiometers

**6ES7274-1XA30-0XA0****Technical specifications**

Article number	<b>6ES7274-1XF30-0XA0</b>	<b>6ES7274-1XH30-0XA0</b>
	S7-1200 Simulator Module SIM1274, 8 Inp	S7-1200 Simulator Module SIM1274, 14 Inp
<b>General information</b>		
Product type designation	SIM 1274, 8DI	SIM 1274, 14 DI
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
<b>Digital inputs</b>		
Number of digital inputs	8	14
<b>Digital outputs</b>		
Number of digital outputs	0	0
<b>Dimensions</b>		
Width	43 mm	67 mm
Height	35 mm	35 mm
Depth	23 mm	23 mm

**Overview**

- Battery board for extending the power reserve for the S7-1200 real-time clock

**Ordering data****Article No.****BB 1297 battery board****6ES7297-0AX30-0XA0**

For long-term backup of real-time clock; can be plugged into the signal board slot of an S7-1200 CPU in FW version 3.0 or higher; battery (CR 1025) is not included

**Terminal block (spare part)**

For signal board  
with 6 screws, gold-plated; 4 units

**6ES7292-1BF30-0XA0****Technical specifications**

Article number	<b>6ES7297-0AX30-0XA0</b> Battery Board BB 1297 f. CPU 12xx
<b>General information</b>	
Product type designation	BB 1297
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• for maintenance	Yes; The maintenance LED (MAINT) of the PLC signals that the battery needs to be replaced.
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Marine approval	Yes

Article number	<b>6ES7297-0AX30-0XA0</b> Battery Board BB 1297 f. CPU 12xx
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Fall height, max.	0.3 m; five times, in product package
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Operation at 25 ° without condensation, max.	95 %
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	40 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

Special modules

### SIWAREX WP231

#### Overview



SIWAREX WP231 is a versatile, legal for trade weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated without a SIMATIC CPU.

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#### Ordering data

##### SIWAREX WP231 weighing module

Single-channel, legal-for-trade, for NAWI non-automatic weighing instruments (e.g. platform scales or hopper scales) with analog load cells (1–4 mV/V), 1 x LC, 4 x DQ, 4 x DI, 1 x AQ, 1 RS 485, Ethernet port.

##### SIWAREX S7-1200 Equipment Manual

Available in a range of languages  
Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

##### SIWAREX WP231 "Ready for Use"

Complete software package for non-automatic weighing instrument (for S7-1200 and a directly connected operator panel).  
Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

##### SIWAREX WP231 "Ready for Use - legal-for-trade"

Software package for non-automatic weighing instruments for S7-1200 requiring official calibration.  
Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

##### Software SecureDisplay

Software for a legal trade display on Windows CE-based Panel. SIMATIC Basic and Key Panels are excluded.  
<http://www.siemens.com/weighing/documentation>  
Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

#### Article No.

7MH4960-2AA01

#### Article No.

##### SIWATOOL V4 & V7

Service and commissioning software for SIWAREX weighing modules

##### Calibration set for SIWAREX WP2xx

Valid for SIWAREX WP231 and SIWAREX WP251.

For verification of up to 3 scales, comprising:

- 3 x inscription foils for ID label
- 1 x protective film
- 3 x calibration protection plates
- Guidelines for verification, certificates and approvals, editable label, SIWAREX WP

##### Ethernet cable patch cord 2 m (7 ft)

For connecting SIWAREX WP231 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.

##### Remote display (optional)

The digital remote displays can be connected directly to the SIWAREX WP231 via the RS 485 interface.  
Suitable remote display: S102  
Siebert Industrieelektronik GmbH  
PO Box 1180  
D-66565 Eppelborn  
Tel.: +49 6806/980-0  
Fax: +49 6806/980-999  
Internet: <https://www.siebert-group.com/en/>  
Detailed information is available from the manufacturer.

7MH4900-1AK01

7MH4960-0AY10

6XV1850-2GH20

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	7MH5001-0AA20	
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel.	7MH5001-0AA00	
<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	7MH5001-0AA01	
<b>SIWAREX DB digital terminal box</b> For enhanced diagnostic and monitoring options in conjunction with SIWAREX WP electronics	7MH5001-0AD20	
<b>SIWAREX IS Ex interface</b> For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. • Short-circuit current < 199 mA DC • Short-circuit current < 137 mA DC	7MH4710-5BA 7MH4710-5CA	
		<b>Cable (optional)</b>
		<b>Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY</b> For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. • Sheath color: orange • For hazardous atmospheres. Sheath color: blue.
		<b>Ground terminal for connecting the load cell cable shield to the grounded DIN rail</b>
		<b>Commissioning</b>
		<b>Commissioning charge for one static scale with SIWAREX module</b> (Flat charge for travel and setup must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale
		<b>Flat charge for travel and setup in Germany</b>
		7MH4702-8AG 7MH4702-8AF 6ES5728-8MA11 9LA1110-8SN50-0AA0 9LA1110-8RA10-0AA0

# SIMATIC S7-1200 Basic Controllers

I/O modules

Special modules

## SIWAREX WP231

### Technical specifications

SIWAREX WP231	
<b>Integration in automation systems</b>	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
<b>Communication interfaces</b>	<ul style="list-style-type: none"> <li>• SIMATIC S7-1200 backplane bus</li> <li>• RS 485 (Modbus RTU, Siebert remote display)</li> <li>• Ethernet (SIWATOOL V7, Modbus TCP/IP)</li> <li>• Analog output 0/4 - 20 mA</li> <li>• 4 × digital outputs 24 V DC, floating, short-circuit proof</li> <li>• 4 × digital inputs 24 V DC, floating</li> </ul>
<b>Commissioning options</b>	<ul style="list-style-type: none"> <li>• Using SIWATOOL V7</li> <li>• Using function block in SIMATIC S7-1200 CPU / Touch Panel</li> <li>• Using Modbus TCP/IP</li> <li>• Using Modbus RTU</li> </ul>
<b>Measuring accuracy</b>	
EU type approval as non-automatic weighing instrument, trade class III	$3000 d \geq 0.5 \mu\text{V/e}$
Error limit according to DIN 1319-1 of full-scale value at $20\text{ °C} \pm 10\text{ K}$ ( $68\text{ °F} \pm 10\text{ K}$ )	0.05%
Internal resolution	Up to $\pm 4$ million parts
Measuring frequency	100 / 120 Hz
<b>Digital filter</b>	Variable adjustable low-pass and average filter
<b>Typical applications</b>	<ul style="list-style-type: none"> <li>• Non-automatic weighing instruments</li> <li>• Force measurements</li> <li>• Fill-level monitoring</li> <li>• Belt tension monitors</li> </ul>
<b>Weighing functions</b>	
Weight values	<ul style="list-style-type: none"> <li>• Gross</li> <li>• Net</li> <li>• Tare</li> </ul>
Limit values	<ul style="list-style-type: none"> <li>• <math>2 \times \text{min/max}</math></li> <li>• Empty</li> </ul>
Zeroing	Per command
Tare	Per command
Tare specification	Per command

SIWAREX WP231	
<b>Load cells</b>	Full-bridge strain gauges in 4-wire or 6-wire system
<b>Load cell powering</b>	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• $R_{L\text{min}}$	$> 40\ \Omega$
• $R_{L\text{max}}$	$< 4\ 100\ \Omega$
With SIWAREX IS Ex interface	
• $R_{L\text{min}}$	$> 50\ \Omega$
• $R_{L\text{max}}$	$< 4\ 100\ \Omega$
<b>Load cell characteristic</b>	1 ... 4 mV/V
<b>Permissible range of the measurement signal (with 4 mV/V sensors)</b>	-21.3 ... +21.3 mV
<b>Max. distance of load cells</b>	500 m (229.66 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
<b>Approvals/certificates</b>	<ul style="list-style-type: none"> <li>• ATEX Zone 2</li> <li>• UL</li> <li>• EAC</li> <li>• KCC</li> <li>• RCM</li> <li>• OIML R76</li> <li>• Design approval 2009/23/EC (NAWI)</li> </ul>
<b>Calibration approval</b>	EU type approval OIML R76
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
<b>IP degree of protection to DIN EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b>	
$T_{\text{min(IND)}} \dots T_{\text{max(IND)}}$ (operating temperature)	
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
• Horizontal installation	-10 ... +55 °C (14 ... 131 °F)
<b>EMC requirements</b>	According to EN 45501
<b>Dimensions</b>	70 × 75 × 100 mm (2.76 × 2.95 × 3.94 inch)

## Overview



SIWAREX WP241 is a flexible weighing module for belt scales. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated as a stand-alone module, i.e. without a SIMATIC CPU.

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Ordering data	Article No.	Ordering data	Article No.
<b>SIWAREX WP241 weighing module</b> Single-channel, for belt scales with analog load cells / full-bridge strain gauge (1 - 4 mV/V), 1 × LC, 4 × DQ, 4 × DI, 1 × AQ, 1 × RS 485, Ethernet port.	7MH4960-4AA01	<b>Accessories</b> <b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	7MH5001-0AA20
<b>SIWAREX S7-1200 Equipment Manual</b> Available in a range of languages Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel.	7MH5001-0AA00
<b>SIWAREX WP241 "Ready for use"</b> Complete software package for belt scale (for S7-1200 and a directly connected operator panel) Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	7MH5001-0AA01
<b>SIWATOOL V4 &amp; V7</b> Service and commissioning software for SIWAREX weighing modules	7MH4900-1AK01	<b>SIWAREX IS Ex interface</b> For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. <ul style="list-style-type: none"> <li>• Short-circuit current &lt; 199 mA DC</li> <li>• Short-circuit current &lt; 137 mA DC</li> </ul>	7MH4710-5BA 7MH4710-5CA
<b>Ethernet cable patch cord 2 m (7 ft)</b> For connecting SIWAREX WP241 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	6XV1850-2GH20	<b>Cable (optional)</b> <b>Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY</b> For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. <ul style="list-style-type: none"> <li>• Sheath color: orange</li> <li>• For hazardous atmospheres. Sheath color: blue.</li> </ul>	7MH4702-8AG 7MH4702-8AF
		<b>Ground terminal for connecting the load cell cable shield to the grounded DIN rail</b>	6ES5728-8MA11

# SIMATIC S7-1200 Basic Controllers

I/O modules

Special modules

## SIWAREX WP241

### Ordering data

#### Commissioning

#### Commissioning charge for one belt scale with SIWAREX module

(Flat charge for travel and setup must be ordered separately)

Scope:

- Recording of data
- Checking of mechanical installation of the scale
- Checking of electrical wiring and function
- Dynamic adjustment of the scale

Requirements:

- Mechanical design functional
- Modules electrically wired and tested
- Calibration weights available
- Free access to scale

### Article No.

9LA1110-8SM50-0AA0

### Article No.

#### Flat charge for travel and setup in Germany

9LA1110-8RA10-0AA0

### Technical specifications

#### SIWAREX WP241

##### Integration in automation systems

S7-1200 SIMATIC S7-1200 system bus

Operator panel and/or automation systems from other vendors Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)

##### Communication interfaces

- SIMATIC S7-1200 backplane bus
- RS 485 (Modbus RTU)
- Ethernet (SIWATOOL V7, Modbus TCP/IP)
- Analog output 0/4 - 20 mA
- 4 × digital outputs, 24 V DC, floating, short-circuit proof
- 4 × digital inputs 24 V DC, floating

##### Commissioning options

- Using SIWATOOL V7
- Using function block in SIMATIC S7-1200 CPU / Touch Panel
- Using Modbus TCP/IP
- Using Modbus RTU

##### Measuring accuracy

Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K) 0.05%

Internal resolution Up to ± 4 million parts

Measuring frequency 100 / 120 Hz

##### Digital filter

Separate, variable adjustable low-pass and average filter for loading and speed

Filter for conveyor load Low-pass filter (limit frequency 0.05 ... 50 Hz)

Filter for belt speed Low-pass filter (limit frequency 0.05 ... 50 Hz)

##### Weighing functions

Readout data

- Weight
- Belt load
- Material flow rate
- Accumulated total
- Main total
- Free totals 1 ... 4
- Belt speed

Limits (min/max)

- Belt load
- Material flow rate
- Belt speed

#### SIWAREX WP241

##### Load cells

Full-bridge strain gauges in 4-wire or 6-wire system

##### Load cell powering

Supply voltage (regulated via feedback) 4.85 V DC

##### Permissible load resistance

- $R_{Lmin}$  > 40 Ω
- $R_{Lmax}$  < 4 100 Ω

##### With SIWAREX IS Ex interface

- $R_{Lmin}$  > 50 Ω
- $R_{Lmax}$  < 4 100 Ω

##### Load cell characteristic

1 ... 4 mV/V

##### Permissible measurement signal range

-21.3 ... +21.3 mV

##### Max. distance of load cells

500 m (229.66 ft)

##### Connection to load cells in Ex zone 1

Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)

##### Approvals/certificates

- ATEX Zone 2
- UL
- EAC
- KCC
- RCM

##### Auxiliary power supply

Rated voltage 24 V DC

Max. power consumption 200 mA

Max. power consumption SIMATIC Bus 3 mA

##### IP degree of protection to DIN EN 60529; IEC 60529

IP20

##### Climatic requirements

$T_{min(IND)}$  ...  $T_{max(IND)}$  (operating temperature)

- Vertical installation -10 ... +40 °C (14 ... 104 °F)
- Horizontal installation -10 ... +55 °C (14 ... 131 °F)

##### EMC requirements

According to EN 45501

##### Dimensions

70 × 75 × 100 mm  
(2.76 × 2.95 × 3.94 inch)



## Overview



SIWAREX WP251 is a flexible weighing module for dosing and filling processes. The compact module can be installed seamlessly in the SIMATIC S7-1200 automation system. It can also be used without a SIMATIC CPU in stand-alone mode.

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## Ordering data

**SIWAREX WP251 weighing module**

Single-channel, legal-for-trade, for automatic dosing and filling scales (AGFI, ACI, NAWI) with analog load cells / full-bridge strain gauges (1 - 4 mV/V), 1 × LC, 4 × DQ, 4 × DI, 1 × AQ, 1 × RS 485, Ethernet port.

**SIWAREX WP251 Equipment Manual**

Available in a range of languages  
Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

**SIWAREX WP251 "Ready for Use"**

Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

**SIWATOOL V4 & V7**

Service and commissioning software for SIWAREX weighing modules

**Calibration set for SIWAREX WP2xx**

Valid for SIWAREX WP231 and SIWAREX WP251.

For verification of up to 3 scales, comprising:

- 3 × inscription foils for ID label
- 1 × protective film
- 3 × calibration protection plates
- Guidelines for verification, certificates and approvals, editable label, SIWAREX WP

## Article No.

7MH4960-6AA01

7MH4900-1AK01

7MH4960-0AY10

## Article No.

**Ethernet cable patch cord 2 m (7 ft)**

For connecting SIWAREX WP251 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.

**Remote display (optional)**

The digital remote displays can be connected directly to the SIWAREX WP251 via the RS 485 interface

Suitable remote display: S102  
Siebert Industrieelektronik GmbH  
PO Box 1180  
D-66565 Eppelborn  
Tel.: +49 6806/980-0  
Fax: +49 6806/980-999

Internet: <https://www.siebert-group.com>

Detailed information is available from the manufacturer.

6XV1850-2GH20

# SIMATIC S7-1200 Basic Controllers

I/O modules

Special modules

## SIWAREX WP251

### Ordering data

### Article No.

#### Accessories

##### SIWAREX JB junction box, aluminum housing

7MH5001-0AA20

For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.

##### SIWAREX JB junction box, stainless steel housing

7MH5001-0AA00

For connecting up to 4 load cells in parallel.

##### SIWAREX JB junction box, stainless steel housing (ATEX)

7MH5001-0AA01

For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).

#### SIWAREX IS Ex interface

For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately.

- Short-circuit current < 199 mA DC
- Short-circuit current < 137 mA DC

7MH4710-5BA

7MH4710-5CA

#### Cable (optional)

##### Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY

For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible.

External diameter: approx. 10.8 mm (0.43 inch)

Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F)

Sold by the meter.

- Sheath color: orange
- For hazardous atmospheres. Sheath color: blue.

7MH4702-8AG

7MH4702-8AF

##### Ground terminal for connecting the load cell cable shield to the grounded DIN rail

6ES5728-8MA11

### Article No.

#### Commissioning

##### Commissioning charge for one static scale with SIWAREX module

9LA1110-8SN50-0AA0

(Flat charge for travel and setup must be ordered separately)

#### Scope:

- Recording of data
- Checking of mechanical installation of the scale
- Checking of electrical wiring and function
- Static adjustment of the scale

#### Requirements:

- Mechanical design functional
- Modules electrically wired and tested
- Calibration weights available
- Free access to scale

##### Flat charge for travel and setup in Germany

9LA1110-8RA10-0AA0

## Technical specifications

SIWAREX WP251		SIWAREX WP251	
<b>Weighing modes</b>	<ul style="list-style-type: none"> <li>Non automatic weighing instrument (NAWI) (filling + removal) (legal-for-trade in accordance with OIML R76)</li> <li>Catchweighing instrument (CWI) (filling + removal) (legal-for-trade in accordance with OIML R51)</li> <li>Gravimetric filling instrument (GFI) (legal-for-trade in accordance with OIML R61)</li> <li>Discontinuous totalizing automatic weighing instrument (DTI) - (legal-for-trade in accordance with OIML R107)</li> </ul>	<b>Number of measurements/second</b>	100 or 120 (selectable)
<b>Integration in automation systems</b>		<b>Filter</b>	<ul style="list-style-type: none"> <li>Low-pass filter 0.1 ... 50 Hz</li> <li>Average value filter</li> </ul>
S7-1200	SIMATIC S7-1200 system bus	<b>Load cells</b>	Strain gauges in 4-wire or 6-wire system
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)	<b>Load cell powering</b>	
<b>Ports</b>	<ul style="list-style-type: none"> <li>1 × SIMATIC S7-1200 system bus</li> <li>1 × Ethernet (SIWATOOL and Modbus TCP/IP)</li> <li>1 × RS 485 (Modbus RTU or remote display)</li> <li>1 × analog output (0/4 - 20 mA)</li> <li>4 × digital inputs (24 V DC, floating)</li> <li>4 × digital outputs (24 V DC, floating, short-circuit proof)</li> </ul>	Supply voltage (regulated via feedback)	4.85 V DC
<b>Functions</b>	<ul style="list-style-type: none"> <li>3 limits</li> <li>Tare</li> <li>Tare specification</li> <li>Zeroing</li> <li>Zero adjustment</li> <li>Statistics</li> <li>Automatic correction of the shut-off points</li> <li>Internal protocol memory for 550 000 entries</li> <li>Trace function for signal analysis</li> <li>Internal restore point</li> <li>Stand-alone mode or SIMATIC S7-1200 integrated</li> </ul>	Permissible load resistance	<ul style="list-style-type: none"> <li><math>R_{Lmin}</math> &gt; 40 Ω</li> <li><math>R_{Lmax}</math> &lt; 4 100 Ω</li> </ul>
<b>Parameter assignment</b>	<ul style="list-style-type: none"> <li>Full access using function block in SIMATIC S7-1200</li> <li>Full access using Modbus TCP/IP</li> <li>Full access using Modbus RTU</li> </ul>	With SIWAREX IS Ex interface	<ul style="list-style-type: none"> <li><math>R_{Lmin}</math> &gt; 50 Ω</li> <li><math>R_{Lmax}</math> &lt; 4 100 Ω</li> </ul>
<b>Remote display</b>		<b>Load cell characteristic</b>	1 ... 4 mV/V
Connection	Via RS 485	<b>Permissible range of the measurement signal (with 4 mV/V sensors)</b>	-21.3 ... +21.3 mV
<b>Scale adjustment</b>	PC software SIWATOOL (Ethernet), S7-1200 function block and touch panel or directly connected operator panel (Modbus)	<b>Max. distance of load cells</b>	500 m (229.66 ft)
<b>Measuring accuracy</b>		<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%	<b>Certificates</b>	<ul style="list-style-type: none"> <li>ATEX Zone 2</li> <li>UL</li> <li>KCC</li> <li>EAC</li> <li>RCM</li> </ul>
Internal resolution	Up to ± 4 million parts	<b>Calibration approvals</b>	<ul style="list-style-type: none"> <li>EU type-examination certificate 2014/31/EU (NAWI) according to OIML R76</li> <li>EU type-examination certificate 2014/32/EU (MID) according to OIML R61 and OIML R51</li> <li>EU type-examination certificates 2014/32/EU (MID) according to OIML R107</li> </ul>
		<b>Auxiliary power supply</b>	
		Rated voltage	24 V DC
		Max. power consumption	200 mA
		Max. power consumption SIMATIC Bus	3 mA
		<b>IP degree of protection to DIN EN 60529; IEC 60529</b>	IP20
		<b>Climatic requirements</b>	
		$T_{min(IND)} \dots T_{max(IND)}$ (operating temperature)	
		• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
		• Horizontal installation	-10 ... +55 °C (14 ... 131 °F)
		<b>EMC requirements</b>	According to EN 45501
		<b>Dimensions</b>	70 × 75 × 100 mm (2.76 × 2.95 × 3.94 inch)

## SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

### CM 1241 communications module

#### Overview



- For quick, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU, 3964(R)
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

#### Ordering data

#### Article No.

##### CM 1241 communications module

Communications module for point-to-point connection, with one RS 422/485 interface

**6ES7241-1CH32-0XB0**

Communications module for point-to-point connection, with one RS 232 interface

**6ES7241-1AH32-0XB0**

##### Accessories

##### Front flap set (spare part)

For communications modules

**6ES7291-1CC30-0XA0**

#### Technical specifications

Article number	<b>6ES7241-1CH32-0XB0</b>	<b>6ES7241-1AH32-0XB0</b>
	Communications Module cm 1241, RS422/485	Communications Module cm 1241, RS232
<b>General information</b>		
Product type designation	CM 1241 RS 422 / 485	CM 1241 RS 232
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
<b>Input current</b>		
Current consumption, max.	220 mA; From backplane bus 5 V DC	200 mA; From backplane bus 5 V DC
<b>Interfaces</b>		
Interfaces/bus type		RS 232C (V.24)
Number of interfaces	1	1
<b>Point-to-point connection</b>		
• Cable length, max.	1 000 m	10 m
<b>Integrated protocol driver</b>		
- Freeport	Yes	Yes
- ASCII	Yes; Available as library function	Yes; Available as library function
- Modbus RTU master	Yes	Yes
- MODBUS RTU slave	Yes	Yes
- USS	Yes; Available as library function	

**Technical specifications**

Article number	<b>6ES7241-1CH32-0XB0</b>	<b>6ES7241-1AH32-0XB0</b>
	Communications Module cm 1241, RS422/485	Communications Module cm 1241, RS232
<b>Protocols</b>		
<b>Integrated protocols</b>		
<b>Freeport</b>		
- Telegram length, max.	1 kbyte	1 kbyte
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
<b>3964 (R)</b>		
- Telegram length, max.	1 kbyte	1 kbyte
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
<b>Modbus RTU master</b>		
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
- Number of slaves, max.	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
<b>MODBUS RTU slave</b>		
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the outputs	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Dimensions</b>		
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	155 g	150 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

### CB 1241 RS485 communication board

#### Overview

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

#### Ordering data

#### Article No.

##### Communication board CB 1241 RS485

for point-to-point connection, with 1 RS485 interface

6ES7241-1CH30-1XB0

##### Accessories

##### Terminal block (spare part)

for signal board  
with 6 screws, gold-plated; 4 pcs.

6ES7292-1BF30-0XA0

#### Technical specifications

Article number	<b>6ES7241-1CH30-1XB0</b> Communication Board CB 1241, RS485
<b>General information</b>	
Product type designation	CB 1241 RS 485
<b>Input current</b>	
from backplane bus 5 V DC, typ.	50 mA
<b>Interfaces</b>	
<b>Point-to-point connection</b>	
• Cable length, max.	1 000 m
<b>Integrated protocol driver</b>	
- Freeport	Yes
- ASCII	Yes; Available as library function
- Modbus RTU master	Yes
- MODBUS RTU slave	Yes
- USS	Yes; Available as library function
<b>Protocols</b>	
<b>Integrated protocols</b>	
<b>Freeport</b>	
- Telegram length, max.	1 kbyte
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
<b>3964 (R)</b>	
- Telegram length, max.	1 kbyte
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
<b>Modbus RTU master</b>	
- Address area	1 through 49 999 (Standard Modbus addressing)
- Number of slaves, max.	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
<b>MODBUS RTU slave</b>	
- Address area	1 through 49 999 (Standard Modbus addressing)

Article number	<b>6ES7241-1CH30-1XB0</b> Communication Board CB 1241, RS485
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	60 °C
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	40 g

## Overview



DP-M	DP-S	FMS	PG/OP	S7
	●			

The CM 1242-5 communications module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the SIMATIC S7-1200 for optimal production.

## Ordering data

## Article No.

**CM 1242-5 communications module**

Communications module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DP slave module

**6GK7242-5DX30-0XE0****Accessories****PROFIBUS FastConnect connection plug RS485**

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps

- Without programming device
- With programming device

**6ES7972-0BA52-0XA0**  
**6ES7972-0BB52-0XA0****PROFIBUS FC Standard Cable**

2-core bus cable, shielded, special design for fast mounting, sold by the meter; delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter

**6XV1830-0EH10****PROFIBUS FastConnect Stripping Tool**

Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable

**6GK1905-6AA00****PROFIBUS bus terminal 12M**

Bus terminal for connection of PROFIBUS nodes at up to 12 Mbps with connecting cable

**6GK1500-0AA10**

# SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

CM 1242-5

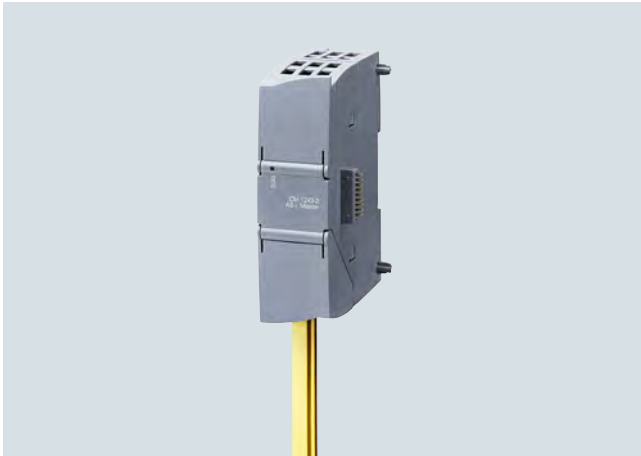
## Technical specifications

Article number	<b>6GK7242-5DX30-0XE0</b>
product type designation	CM 1242-5
<b>transfer rate</b>	
transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	0
type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
power loss [W]	0.75 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 45 °C
• for horizontally arranged busbars during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Article number	<b>6GK7242-5DX30-0XE0</b>
product type designation	CM 1242-5
<b>design, dimensions and weights</b>	
module format	Compact module S7-1200 single width
width	30 mm
height	100 mm
depth	75 mm
net weight	0.115 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	3
<b>performance data PROFIBUS DP</b>	
service as DP slave	
• DPV0	Yes
• DPV1	Yes
data volume	
• of the address range of the inputs as DP slave total	240 byte
• of the address range of the outputs as DP slave total	240 byte
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	No
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 Basic/Professional

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**Overview**

The CM 1243-2 communications module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions in accordance with the AS-Interface Specification V3.0
- Indication of the operating state on the front of the device displayed via LED
- Display of operating mode, AS-Interface voltage faults, configuration faults and peripheral faults via LED behind the front panel
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-Interface with 30 V voltage and AS-i Power24V: In combination with the optional DCM 1271 data decoupling module, a standard 24 V power supply unit can be used
- Configuration and diagnostics via the TIA Portal

**Design**

The CM 1243-2 communications module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It has:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals each
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in scope of supply) can be removed to facilitate installation.

**Function**

The CM 1243-2 supports all specified functions of the AS-Interface Specification V3.0.

The values of the digital AS-i slaves can be activated via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be accessed directly in the process image.

If required, master calls can be performed with the data record interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

The optional DCM 1271 data decoupling module has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A.

For more information on DCM 1271, see page 3/135

**Notes on security**

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see <http://www.siemens.com/industrialsecurity>.

**Configuration**

The TIA Portal enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

When operating on a S7-1200 CPU with firmware V4.0 or higher, firmware V1.1 (or higher) is required for the CM 1243-2 module.

**Benefits**

- More flexibility and versatility in the use of SIMATIC S7-1200 as the result of a significant increase in the number of digital and analog inputs/outputs available
- Very easy configuration and diagnostics of the AS-Interface via the TIA Portal
- Simple operation with AS-Interface power supply unit (see <https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/8200165?tree=CatalogTree>) without restrictions
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. For decoupling, the AS-i DCM 1271 data decoupling module is required, see page 3/135
- LEDs for indication of fault statuses for fast diagnostics
- Monitoring of AS-Interface voltage facilitates diagnostics

## SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

### AS-Interface communication >CM 1243-2 AS-i Master

#### Application

The CM 1243-2 is the AS-Interface master connection for the 12x CPUs of the SIMATIC S7-1200. Through connection to AS-Interface, the number of digital inputs and outputs available for the S7-1200 is greatly increased (max. 496 DI / 496 DQ on the AS-Interface per CM).

The integrated analog value processing also makes the analog values available at the AS-Interface for the S7-1200. Up to 31 analog slaves with a standard address (each with up to four channels) or up to 62 analog slaves with an A/B address (each with up to two channels) are possible per CM.

#### Operating conditions

- The CM 1243-2 communications module exchanges data with the S7-1200 CPU with a cycle time of 10 ms.
- The AS-i cycle time depends on the AS-i bus capacity and is up to 5 ms in the case of 31 slave addresses; for more information, see manual AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module for SIMATIC S7-1200, <https://support.industry.siemens.com/cs/ww/en/view/57358958>.
- For calculation of the maximum switching frequency at inputs/outputs of AS-i slaves, these cycle times and the runtime of the user program must be added up.

#### Ordering data

#### Article No.

##### CM 1243-2 communications module 3RK7243-2AA30-0XB0

- AS-Interface master for SIMATIC S7-1200
- Corresponds to AS-Interface Specification V3.0
- With screw terminals, removable terminals (included in the scope of supply)
- Dimensions (W × H × D / mm): 30 × 100 × 75

#### Note:

The CM 1243-2 communications module is available as a SIPLUS version under Article No. 6AG1243-2AA30-7XB0 in the extended temperature range (from -25 to 70 °C) and for use in harsh environmental conditions (coated according to environment standard IEC 60721). For more information, see [page 3/157](#)

#### Accessories

##### Screw terminals (replacement)

- For screw terminals, 5-pole For AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module

3RK1901-3MA00

##### AS-interface addressing unit V3.0

- For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0
- For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves)
- With input/output test function and many other commissioning functions
- Battery operation with four type AA batteries (IEC LR6, NEDA 15)
- Degree of protection IP40
- Dimensions (W × H × D / mm): 84 × 195 × 35
- Scope of supply:
  - Addressing unit with four batteries
  - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m

3RK1904-2AB02

#### More information

##### More information

Manuals, see <https://support.industry.siemens.com/cs/ww/en/ps/15750/man>

**Overview**

With the aid of the DCM 1271 data decoupling module, the AS-Interface network can also be supplied with 24 V DC or 30 V DC from a standard power supply unit and the transmission of data and power can be implemented on one cable.

The DCM 1271 data decoupling module has the same type of enclosure as an S7-1200 module and can therefore be perfectly combined with the AS-i Master CM 1243-2.

The DCM 1271 data decoupling module has no connection to the backplane bus of the SIMATIC S7-1200 and is therefore not counted as a communications module for the calculation of the maximum configuration.

**Features of the DCM 1271 data decoupling module**

- Design: S7-1200, 30 mm wide, degree of protection IP20
- Detachable terminals (included in delivery)
- Single data decoupling
- Supply of several AS-i networks with a single power supply unit
- Operation with 24 V DC or 30 V DC, grounded or non-grounded
- Current limitation at 4 A
- Integrated ground-fault detection
- Diagnostic LEDs for ground faults and overloads
- Signaling contact for ground-fault detection

**Ground-fault detection**

The integrated ground fault detection functions with grounded and non-grounded power supply: The connection of negative pole and ground (upstream from the data decoupling module) customary with 24 V DC power supplies is permitted. A ground fault to the negative or positive pole on the AS-Interface network (behind the data decoupling module) is identified and signaled via LED and a transistor output.

**Benefits**

- An existing standard power supply unit with 24 V DC or 30 V DC can be used for supplying AS-i networks
- The AS-Interface system can also be used in tightly budgeted applications because no AS-Interface power supply unit needs to be purchased
- Applications benefit in addition from the advantages of a modern bus system:
  - High level of standardization
  - Additional diagnostics and maintenance information
  - Faster commissioning

**Application**

The AS-Interface data decoupling module is designed for AS-Interface networks with 30 V or 24 V supply (AS-i Power24V).

Operation of an AS-i network with the data decoupling module and a 30 V standard power supply unit is technically equivalent to the use of an AS-Interface power supply unit and offers the service-proven features of AS-Interface for all applications.

AS-i Power24V uses a 24 V power supply unit in conjunction with a data decoupling module and is particularly suitable for

- Compact machines using AS-Interface input/output modules
- Applications in the control cabinet for AS-Interface integration of SIRIUS 3RT2 contactors using 3RA27 function modules

**Note:**

The power supply units must comply with the standard ES1 (IEC 62368-1) or PELV (Protective Extra Low Voltage) or SELV (Safety Extra Low Voltage), have a residual ripple of < 250 mV<sub>SS</sub>, and in the event of a fault must limit the output voltage to a maximum of 40 V.

**Recommended**

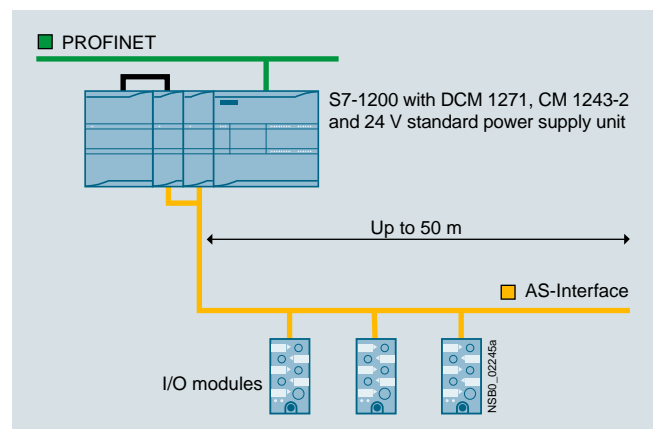
- SITOP-power supplies, see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10244081?tree=CatalogTree> or <https://support.industry.siemens.com/cs/ww/en/view/109745655>
- PSN130S 30 V power supply units, see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10174512?tree=CatalogTree>.

**Note on AS-i Power24V:**

The length of an AS-i Power24V network is restricted to 50 m in order to limit the voltage drop along the cable.

AS-i Masters, AS-i slaves and the sensors and actuators supplied through the AS-i cable must be designed for the reduced voltage. Sensors and actuators for the standard voltage range of 10 to 30 V can be supplied with sufficient voltage.

Please also observe the requirements specified under "AS-i Power24V" for the operation of a AS-i Power24V network, see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10057530?tree=CatalogTree>.



Configuration of an AS-i Power24V network with AS-Interface DCM 1271 data decoupling module

**SIMATIC S7-1200 Basic Controllers**

I/O modules

Communication

**AS-Interface communication > DCM 1271 data decoupling module****Ordering data****Article No.****DCM 1271 data decoupling module** **3RK7271-1AA30-0AA0**

- With screw terminals, removable terminals (included in the scope of supply)
- Current max.: 1 x 4 A
- Dimensions (W x H x D / mm): 30 x 100 x 75

**Accessories****Screw terminals (replacement)**

- With screw terminals, 5-pole  
For AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module
- With screw terminals, 3-pole  
for AS-i DCM 1271 data decoupling module for connecting the power supply unit

**3RK1901-3MA00****3RK1901-3MB00****CM 1243-2 communications module** **3RK7243-2AA30-0XB0**

- AS-Interface master for SIMATIC S7-1200
- Corresponds to AS-Interface Specification V3.0
- With screw terminals, removable terminals (included in the scope of supply)
- Dimensions (W x H x D / mm): 30 x 100 x 75

**More information****More information**

Manual for AS-i Master CM 1234-2 and AS-i DCM 1271 data decoupling module, see <https://support.industry.siemens.com/cs/ww/en/view/57358958>

More information on AS-i Power24V, see "System Manual AS-Interface", <https://support.industry.siemens.com/cs/ww/en/view/26250840>

3

## Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

The CM 1243-5 communications module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows programming devices and operator panels with PROFIBUS interfaces to be connected to the SIMATIC S7-1200
- Module replacement without programming device supported
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industrial enclosure in SIMATIC S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the SIMATIC S7-1200 for optimal production.

## Ordering data

## Article No.

**CM 1243-5 communications module**

Communications module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master

**6GK7243-5DX30-0XE0****Accessories****PROFIBUS FastConnect connection plug RS485**

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps

- Without programming device
- With programming device

**6ES7972-0BA52-0XA0**  
**6ES7972-0BB52-0XA0****PROFIBUS FC Standard Cable**

2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter

**6XV1830-0EH10****PROFIBUS FastConnect Stripping Tool**

Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable

**6GK1905-6AA00****PROFIBUS bus terminal 12M**

Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable

**6GK1500-0AA10**

# SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

CM 1243-5

## Technical specifications

Article number	<b>6GK7243-5DX30-0XE0</b>
product type designation	CM 1243-5
<b>transfer rate</b>	
transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	3-pole terminal block
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	20 %
consumed current	
• from external supply voltage at DC at 24 V typical	0.1 A
power loss [W]	2.4 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 45 °C
• for horizontally arranged busbars during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-1200 single width
width	30 mm
height	100 mm
depth	75 mm
net weight	0.134 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes

Article number	<b>6GK7243-5DX30-0XE0</b>
product type designation	CM 1243-5
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	3
<b>performance data PROFIBUS DP</b>	
service as DP master	
• DPV1	Yes
number of DP slaves	
• on DP master operable	32
data volume	
• of the address range of the inputs as DP master total	512 byte
• of the address range of the outputs as DP master total	512 byte
• of the address range of the inputs per DP slave	244 byte
• of the address range of the outputs per DP slave	244 byte
• of the address range of the diagnostic data per DP slave	240 byte
service as DP slave	
• DPV0	No
• DPV1	No
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	8; max. 4 connections to other S7 stations
• with PG connections maximum	1
• with PG/OP connections maximum	3
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	
• without DP maximum	8
• with DP maximum	8
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	No
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 Basic/Professional

3

## Overview



- Unmanaged switch for connecting a SIMATIC S7-1200 to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIMATIC S7-1200 for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIMATIC S7-1200 DIN rail
- Low-cost solution for implementing small, local Ethernet networks
- Connection without any problems using RJ45 standard plug connectors
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

## Ordering data

## Article No.

**CSM 1277 compact switch module**

Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, diagnostics on LEDs, S7-1200 module including electronic manual on CD-ROM

6GK7277-1AA10-0AA0

**SIPLUS NET CSM 1277 compact switch module**

Unmanaged switch for connection of SIPLUS S7-1200 and up to three further stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic manual on CD-ROM

6AG1277-1AA10-4AA0

**Accessories****IE FC TP trailing cable 2 x 2 (Type C)**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45/ IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

6XV1840-3AH10

**IE FC RJ45 plug 180 2 x 2**

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

**IE FC outlet RJ45**

For connection of Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more

6GK1901-1FC00-0AA0

**IE TP cord RJ45/RJ45**

- TP cord pre-assembled with 2 RJ45 plug connectors; length: 0.5 m
- TP cable 4 x 2 with 2 RJ45 plug connectors; length: 0.5 m

6XV1850-2GE50

6XV1870-3QE50

# SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

## CSM 1277 unmanaged

### Technical specifications

Article number	<b>6GK7277-1AA10-0AA0</b>
product type designation	SCALANCE CSM 1277
<b>transfer rate</b>	
transfer rate	10 Mbit/s, 100 Mbit/s
<b>interfaces for communication integrated</b>	
number of electrical connections	4
• for network components or terminal equipment	
number of 100 Mbit/s SC ports	0
• for multimode	
number of 1000 Mbit/s LC ports	0
• for multimode	
• for single mode (LD)	0
<b>interfaces other</b>	
number of electrical connections	1
• for power supply	
type of electrical connection	
• for power supply	3-pole terminal block
<b>supply voltage, current consumption, power loss</b>	
type of voltage 1 of the supply voltage	DC
• supply voltage 1 rated value	24 V
• power loss [W] 1 rated value	1.6 W
• supply voltage 1 rated value	19.2 ... 28.8 V
• consumed current 1 maximum	0.07 A
• type of electrical connection 1 for power supply	3-pole terminal block
• product component 1 fusing at power supply input	Yes
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
design	SIMATIC S7-1200 device design
width	45 mm
height	100 mm
depth	75 mm
net weight	0.15 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes
• wall mounting	Yes
• S7-300 rail mounting	No
• S7-1500 rail mounting	No

Article number	<b>6GK7277-1AA10-0AA0</b>
<b>product functions management, configuration, engineering</b>	
product function	
• multiport mirroring	No
product function switch-managed	No
<b>product functions redundancy</b>	
product function	
• Parallel Redundancy Protocol (PRP)/operation in the PRP-network	Yes
• Parallel Redundancy Protocol (PRP)/Redundant Network Access (RNA)	No
<b>standards, specifications, approvals</b>	
standard	
• for FM	FM3611: Class 1, Division 2, Group A, B, C, D / T... CL.1, Zone 2, GP. IIC, T.. Ta
• for safety from CSA and UL	UL 508, CSA C22.2 No. 142
• for emitted interference	EN 61000-6-4 (Class A)
• for interference immunity	EN 61000-6-2
MTBF	273 y
<b>standards, specifications, approvals CE</b>	
certificate of suitability CE marking	Yes
<b>standards, specifications, approvals hazardous environments</b>	
standard for hazardous zone	EN 600079-15:2005, EN 600079-0:2006, II 3 G Ex nA II T4, KEMA 08 ATEX 0003 X
certificate of suitability	
• CCC for hazardous zone according to GB standard	Yes
<b>standards, specifications, approvals other</b>	
certificate of suitability	EN 61000-6-2, EN 61000-6-4
• C-Tick	Yes
• KC approval	No
<b>standards, specifications, approvals marine classification</b>	
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• French marine classification society (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No

### More information

#### Selection Tool:

To support the selection of SCALANCE network components, the TIA Selection Tool is available at:

<http://www.siemens.com/tst>



## Overview



The CP 1243-1 communications processor is used for connecting the SIMATIC S7-1200 to telecontrol centers via remote networks and telecontrol protocols (DNP3, IEC 60870-5-104, TeleControl Basic), and for safe communication via IP-based networks.

The CP has the following features:

- Ethernet-based connection to TeleControl Server Basic, e.g. via Internet
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures
- Secure communication via VPN connections based on IPSec
- Access protection via stateful inspection firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7

## Ordering data

## Article No.

### CP 1243-1 communications processor

CP 1243-1 communications processor for connecting SIMATIC S7-1200 as an additional Ethernet interface and for connection to control centers via telecontrol protocols (DNP3, IEC 60870, TeleControl Basic), security (firewall, VPN)

**6GK7243-1BX30-0XE0**

### Accessories

#### Compact Switch Module CSM 1277

Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic device manual on CD-ROM

**6GK7277-1AA10-0AA0**

#### IE FC RJ45 plugs

RJ45 connectors for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

#### IE FC RJ45 plug 180

180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

#### IE FC TP standard cable GP 2 x 2 (Type A)

4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE F RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m

**6XV1840-2AH10**

#### IE FC Stripping Tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**6GK1901-1GA00**

## Technical specifications

Article number	<b>6GK7243-1BX30-0XE0</b>
product type designation	CP 1243-1
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	0
type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port

Article number	<b>6GK7243-1BX30-0XE0</b>
product type designation	CP 1243-1
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
consumed current	
• from backplane bus at DC at 5 V typical	0.25 A
power loss [W]	1.25 W

# SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

CP 1243-1

## Technical specifications

Article number	<b>6GK7243-1BX30-0XE0</b>
product type designation	CP 1243-1
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-1200 single width
width	30 mm
height	110 mm
depth	75 mm
net weight	0.122 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes
• wall mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	3
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum	like CPU
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	like CPU
<b>performance data IT functions</b>	
number of possible connections	
• as email client maximum	1
<b>performance data telecontrol</b>	
suitability for use	
• node station	No
• substation	Yes
• TIM control center	No
control center connection	For use with TeleControl Server Basic, WinCC and PCS7
• by means of a permanent connection	supported
• note	Connection to SCADA system via Telecontrol Server Basic and Standard Telecontrol protocols
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
product function data buffering if connection is aborted	Yes; 64,000 events
number of data points per station maximum	500
number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15

Article number	<b>6GK7243-1BX30-0XE0</b>
product type designation	CP 1243-1
<b>performance data teleservice</b>	
diagnostics function online diagnostics with SIMATIC STEP 7	Yes
product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 Basic/Professional
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes
<b>product functions security</b>	
firewall version	stateful inspection
product function with VPN connection	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1, SHA-2
number of possible connections with VPN connection	8
product function	
• password protection for Web applications	No
• password protection for teleservice access	No
• encrypted data transmission	Yes
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	No
<b>product functions time</b>	
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes

## Overview



The CP 1242-7 GPRS V2 communications processor is used to connect a SIMATIC S7-1200 to the globally available GSM/GPRS mobile radio network and has the following characteristics:

- Worldwide wireless exchange of data between S7-1200 controllers and/or between S7-1200 controllers and control centers with an Internet connection
- Communication based on the GPRS (**G**eneral **P**acket **R**adio **S**ervice) mobile wireless service with data transmission speeds of up to 86 kbps in the downlink and 43 kbps in the uplink
- GPRS mode with fixed IP addresses and dynamic IP addresses with standard mobile phone contract
- Time synchronization based on NTP (**N**etwork **T**ime **P**rotocol)
- Sending and receiving of text messages
- LED signaling for fast diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7

In conjunction with the TeleControl Server Basic software, the CP 1242-7 forms a telecontrol system with additional properties:

- Connection of up to 5000 telecontrol stations to the control center via an OPC interface
- Data buffering in the substations in the event of connection failures
- Central status monitoring of the substations
- No special provider services required for fixed IP addresses
- Teleservice access with STEP 7 to the substations via the Internet

The CP 1242-7 V2 is a new product version of the CP 1242-7. The concept for process data transmission has been expanded with a simple data point configuration, which enables substantially easier commissioning without high programming overhead and minimizes susceptibility to errors during the projects implementation phase. CP 1242-7 has also been equipped with new functions, such as access to the internal web server of the S7-1200. This opens up numerous new application areas.

## Ordering data

## Article No.

**Communications processor CP 1242-7 GPRS<sup>1)</sup>**

Communications processor CP 1242-7 GPRS V2 for connecting SIMATIC S7-1200 to TeleControl Server Basic via GSM/GPRS mobile radio network

6GK7242-7KX31-0XE0

**Accessories****ANT794-4MR antenna**

Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional; weatherproof for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs

6NH9860-1AA00

**ANT794-3M antenna**

Flat panel antenna for GSM (2G) networks, for triband with 900/1 800/1 900 MHz; weatherproof for indoor/outdoor use, 1.2 m cable with fixed connection to antenna; SMA connector, incl. assembly adhesive tape

6NH9870-1AA00

<sup>1)</sup> Please note country approvals under:  
[www.siemens.com/mobilenetwork-approvals](http://www.siemens.com/mobilenetwork-approvals)

## Technical specifications

Article number	<b>6GK7242-7KX31-0XE0</b>
product type designation	CP 1242-7 V2
<b>transfer rate</b>	
transfer rate	
• for GPRS transmission	
- with downlink maximum	86 kbit/s
- with uplink maximum	43 kbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	0
number of electrical connections	
• for external antenna(s)	1
• for power supply	1
number of slots	
• for SIM cards	1
type of electrical connection	
• for external antenna(s)	SMA socket (50 ohms)
• for power supply	3-pole terminal block
slot version	
• for SIM card	Standard

# SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

## CP 1242-7 GPRS

### Technical specifications

Article number	<b>6GK7242-7KX31-0XE0</b>
product type designation	CP 1242-7 V2
<b>wireless technology</b>	
type of mobile wireless service	
• is supported SMS	Yes
• is supported GPRS	Yes
• note	GPRS (Multislot Class 10)
type of wireless network is supported	
• GSM	Yes
• UMTS	No
• LTE	No
operating frequency	
• 850 MHz	Yes
• 900 MHz	Yes
• 1800 MHz	Yes
• 1900 MHz	Yes
transmit power	
• at operating frequency 900 MHz	2 W
• at operating frequency 1800 MHz	1 W
• at operating frequency 1900 MHz	1 W
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	20 %
consumed current	
• from external supply voltage at DC at 24 V typical	0.1 A
• from external supply voltage at DC at 24 V maximum	0.22 A
power loss [W]	2.4 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-1200 single width
width	30 mm
height	100 mm
depth	75 mm
net weight	0.133 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes

Article number	<b>6GK7242-7KX31-0XE0</b>
product type designation	CP 1242-7 V2
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	3
<b>performance data</b>	
number of users/telephone numbers definable maximum	10
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum	like CPU
<b>performance data IT functions</b>	
number of possible connections	
• as email client maximum	1
<b>performance data telecontrol</b>	
control center connection	Telecontrol Server Basic supported
• by means of a permanent connection	supported
• by means of demand-oriented connection	supported
• note	Connection to SCADA system using OPC interface
protocol is supported	
• DNP3	No
• IEC 60870-5	No
product function data buffering if connection is aborted	Yes; 64,000 events
number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
<b>performance data teleservice</b>	
diagnostics function online diagnostics with SIMATIC STEP 7	Yes
product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 Basic/Professional
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes
<b>product functions security</b>	
product function	
• password protection for teleservice access	Yes
• encrypted data transmission	Yes
<b>product functions time</b>	
protocol is supported	
• NTP	Yes
time synchronization	
• from control center	Yes

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## Overview



CP 1243-7 LTE is used to connect the S7-1200 to a mobile wireless 4th Generation LTE (Long Term Evolution) network. The increased data rates compared to GPRS and widespread introduction of LTE open up new areas of application. The CP1243-7 is characterized by the following properties:

- 1 connection to LTE (4G) mobile wireless network (various versions for EU and North America)
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Operation with fixed IP addresses and dynamic IP addresses with standard cellular phone contract
- Time synchronization based on NTP (Network Time Protocol)
- "On-demand" connection setup via voice call or SMS
- Sending and receiving of SMS
- Teleservice access with STEP 7 to substations via mobile wireless networks
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Temperature range in operation: -20°C to +70°C
- DIN rail mounting
- Diagnostics LEDs (overall status and details)
- Integrated security functions (VPN and firewall)
- Access to the CPU web server
- Fast commissioning due to simplified configuration with STEP 7
- Data buffering of up to 64 000 values ensures a secure database even with temporary connection failures
- Support of SINEMA Remote Connect with autoconfiguration

## Ordering data

## Article No.

**Communication processor  
CP 1243-7 LTE**

Communication processor for connecting SIMATIC S7-1200 to TeleControl Server Basic via LTE mobile wireless network

- **CP 1243-7 LTE EU**  
Frequencies in European band: 700, 1 700 MHz

Frequencies in European band: 700, 1 700 MHz

- **CP 1243-7 LTE US**  
Frequencies in North American band: 800, 1 800, 2 600 MHz

**6GK7243-7KX30-0XE0****6GK7243-7SX30-0XE0****Accessories****ANT794-4MR antenna**

Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional; weatherproof for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs

**6NH9860-1AA00**

# SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

## CP 1243-7 LTE

### Technical specifications

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
<b>transfer rate</b>		
transfer rate		
• for LTE transmission		
- with downlink maximum	42 Mbit/s	42 Mbit/s
- with uplink maximum	5.76 Mbit/s	5.76 Mbit/s
<b>interfaces</b>		
number of interfaces acc. to Industrial Ethernet	0	0
number of electrical connections		
• for external antenna(s)	1	1
• for power supply	1	1
number of slots		
• for SIM cards	1	1
type of electrical connection		
• for external antenna(s)	SMA socket (50 ohms)	SMA socket (50 ohms)
• for power supply	3-pole terminal block	3-pole terminal block
slot version		
• for SIM card	Standard	Standard
<b>wireless technology</b>		
type of mobile wireless service		
• is supported SMS	Yes	Yes
• is supported GPRS	Yes	Yes
• note	GPRS (Multislot Class 10)	GPRS (Multislot Class 10)
type of wireless network is supported		
• GSM	Yes	Yes
• UMTS	Yes	Yes
• LTE	Yes	Yes
operating frequency		
• 850 MHz		Yes
• 1900 MHz		Yes
operating frequency for GSM transmission	operating frequency for GSM transmission 900 MHz, operating frequency for GSM transmission 1800 MHz	
operating frequency with UMTS transmission	operating frequency with UMTS transmission 900 MHz, operating frequency with UMTS transmission 2100 MHz	
operating frequency for LTE transmission	operating frequency for LTE transmission 800 MHz, operating frequency for LTE transmission 1800 MHz, operating frequency for LTE transmission 2600 MHz	operating frequency for LTE transmission 700 MHz, operating frequency for LTE transmission 1700 MHz

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
<b>supply voltage, current consumption, power loss</b>		
type of voltage of the supply voltage	DC	DC
supply voltage external	24 V	24 V
supply voltage external at DC rated value	24 V	24 V
relative positive tolerance at DC at 24 V	20 %	20 %
relative negative tolerance at DC at 24 V	20 %	20 %
consumed current		
• from external supply voltage at DC at 24 V typical	0.1 A	0.1 A
• from external supply voltage at DC at 24 V maximum	0.22 A	0.22 A
<b>ambient conditions</b>		
ambient temperature		
• for vertical installation during operation	-20 ... +60 °C	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C	-20 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
relative humidity		
• at 25 °C without condensation during operation maximum	95 %	95 %
protection class IP	IP20	IP20
<b>design, dimensions and weights</b>		
module format	Compact module S7-1200 single width	Compact module S7-1200 single width
width	30 mm	30 mm
height	100 mm	100 mm
depth	75 mm	75 mm
net weight	0.133 kg	0.133 kg
fastening method		
• 35 mm top hat DIN rail mounting	Yes	Yes
• S7-300 rail mounting	No	No
• wall mounting	Yes	Yes
<b>product features, product functions, product components general</b>		
number of units		
• per CPU maximum	3	3

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#### Technical specifications

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
<b>performance data</b>		
number of users/telephone numbers definable maximum	10	10
<b>performance data open communication</b>		
number of possible connections for open communication		
• by means of T blocks maximum	like CPU	like CPU
<b>performance data IT functions</b>		
number of possible connections		
• as email client maximum	1	1
<b>performance data telecontrol</b>		
suitability for use		
• substation	Yes	Yes
control center connection	Telecontrol Server Basic	Telecontrol Server Basic
• by means of a permanent connection	supported	supported
• by means of demand-oriented connection	supported	supported
• note	Connection to SCADA system using OPC interface	Connection to SCADA system using OPC interface
protocol is supported		
• DNP3	No	No
• IEC 60870-5	No	No
product function data buffering if connection is aborted	Yes; 64,000 events	Yes; 64,000 events
number of stations for direct communication with Telecontrol Server Basic		
• in send direction maximum	3	3
• in receive direction maximum	15	15
<b>performance data teleservice</b>		
diagnostics function online diagnostics with SIMATIC STEP 7	Yes	Yes
product function		
• program download with SIMATIC STEP 7	Yes	Yes
• remote firmware update	Yes	Yes

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
<b>product functions management, configuration, engineering</b>		
configuration software		
• required	STEP 7 Basic/Professional	STEP 7 Basic/Professional
<b>product functions diagnostics</b>		
product function web-based diagnostics	Yes	Yes
<b>product functions security</b>		
firewall version	stateful inspection	stateful inspection
product function with VPN connection	IPsec, SINEMA RC	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1	MD5, SHA-1
number of possible connections with VPN connection	1	1
product function		
• password protection for teleservice access	Yes	Yes
• encrypted data transmission	Yes	Yes
<b>product functions time</b>		
protocol is supported		
• NTP	Yes	Yes
time synchronization		
• from control center	Yes	Yes

## SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

### CP 1243-8 IRC

#### Overview



The CP 1243-8 IRC (Industrial Remote Communication) communications processor is used for connecting a SIMATIC S7-1200 via the SINAUT ST7 telecontrol protocol to higher-level ST7 stations or to an ST7 control center. The CP 1243-8 IRC (as of HW2 and firmware V3.0) also offers connection to a DNP3 or IEC-capable control center via a corresponding open DNP3 or IEC 60870-5-104 telecontrol protocol. The CP 1243-8 IRC (as of HW2 and firmware V3.0) also offers connection to a DNP3 or IEC-capable control center via a corresponding open DNP3 or IEC 60870-5-104 telecontrol protocol.

The CP has the following features:

- Support for telecontrol protocol SINAUT ST7, DNP3, IEC 60870-5-104
- Two WAN connections for selecting the communication paths:
  - Ethernet-based connection: RJ45 port on the module for connecting external routers, e.g. SCALANCE M
  - Additional connection configurable via plug-in TS modules
- Both WAN interfaces can also be operated simultaneously: Route redundancy
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic transmission of alarms per email or text message
- Time synchronization based on NTP (Network Time Protocol) or via the SINAUT system
- Data buffering of up to 16,000 data frames prevents data loss in the event of temporary connection failures
- Secure communication via VPN connections based on IPSec
- Access protection via Stateful Inspection Firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Fast and simple diagnostics via clear LED indicators, STEP 7 and web browser
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail

The integrated Ethernet interface and the option of using the TS modules provide flexible connection options for the CP. The following TS modules are available:

- TS module RS232
- TS module MODEM
- TS module ISDN

#### Ordering data

#### Article No.

Ordering data	Article No.
<b>CP 1243-8 IRC communications processor</b>	<b>6GK7243-8RX30-0XE0</b>
Communications processor for connecting a SIMATIC S7-1200 via the SINAUT ST7 telecontrol protocol to higher-level ST7 stations or to an ST7 control center, or a DNP3 or IEC-capable control center via a corresponding DNP3 or IEC 60870-5-104 open telecontrol protocols	
<b>Accessories</b>	
<b>SINAUT engineering software V5.5 + SP3</b>	<b>6NH7997-0CA55-0AA0</b>
On CD, consisting of: <ul style="list-style-type: none"> <li>• SINAUT ST7/DNP3 configuration and diagnostic software for STEP 7 V5.6</li> <li>• SINAUT TD7 block library</li> <li>• Electronic manual in German and English</li> </ul>	
<b>SINAUT engineering software V5.5 Upgrade from V5.0, V5.1, V5.2, V5.3 or V5.4</b>	<b>6NH7997-0CA55-0GA0</b>
<b>TeleService module</b>	
Connection to TS Adapter IE Basic/Advanced or CP 1243-8 IRC. Power supply via TS Adapter IE Basic/Advanced or CP 1243-8 IRC.	
<b>TS module RS 232</b>	<b>6ES7972-0MS00-0XA0</b>
<b>TS module modem</b>	<b>6ES7972-0MM00-0XA0</b>
<b>TS module ISDN</b>	<b>6ES7972-0MD00-0XA0</b>
<b>CSM 1277 compact switch module</b>	<b>6GK7277-1AA10-0AA0</b>
Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic device manual on CD-ROM	



<sup>1)</sup> Please note country approvals under:

<http://www.siemens.com/mobilenetwork-approvals>.



## Technical specifications

Article number	<b>6GK7243-8RX30-0XE0</b>
product type designation	CP 1243-8 IRC
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
• at the 2nd interface	0.3 ... 115.2 kbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	1
type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
type of electrical connection	
• at interface 2 for external data transmission	Interface to the TS Module
• for power supply	3-pole terminal block
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
supply voltage external	24 V
supply voltage external	19.2 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	19.2 ... 28.8 V
consumed current	
• from backplane bus at DC at 5 V typical	0.25 A
• from external supply voltage at DC at 24 V typical	0.1 A
power loss [W]	2.4 W; 1.25 W from S7-1200 backplane without TS module. 2.4 W from 24 V DC external with TS module
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... -70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Article number	<b>6GK7243-8RX30-0XE0</b>
product type designation	CP 1243-8 IRC
<b>design, dimensions and weights</b>	
module format	Compact module S7-1200 single width
width	30 mm
height	110 mm
depth	75 mm
net weight	0.122 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	1
• note	One CP pluggable on left side of CPU, one TS Module pluggable left side of CP.
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum	like CPU
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	Configured S7-Connection for S7-Communication
• with PG connections maximum	2
• with OP connections maximum	1
service	
• SINAUT ST7 via S7 communication	Yes
<b>performance data IT functions</b>	
number of possible connections	
• as email client maximum	1

# SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

## CP 1243-8 IRC

### Technical specifications

Article number	<b>6GK7243-8RX30-0XE0</b>
product type designation	CP 1243-8 IRC
<b>performance data telecontrol</b>	
suitability for use	
• node station	No
• substation	Yes
• TIM control center	No
• note	Ethernet and TS Module can be operated in parallel
control center connection	control center with ST7 function supported
• by means of a permanent connection	
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST7 protocol	Yes
product function data buffering if connection is aborted	Yes; DNP3, IEC60870-5: 64000 events, SINAUT ST7: 16000 telegrams
number of data points per station maximum	500
transmission format	
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST7 protocol	Polling
• with dial-up network with SINAUT ST7 protocol	spontaneous
hamming distance	
• for SINAUT ST7 protocol	4
<b>performance data teleservice</b>	
diagnostics function online	Yes
diagnostics with SIMATIC STEP 7 product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes
<b>product functions management, configuration, engineering</b>	
protocol is supported	
• SNMP v3	Yes
• DCP	Yes
configuration software	
• required	SINAUT ES V5.5 and STEP7 V13 SP1 or higher
• for PG configuring required SINAUT ST7 configuration software for PG	Yes

Article number	<b>6GK7243-8RX30-0XE0</b>
product type designation	CP 1243-8 IRC
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes
<b>product functions security</b>	
firewall version	stateful inspection
operating mode Virtual Private Network (VPN)	Yes
product function with VPN connection	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1
number of possible connections with VPN connection	8
product function	
• password protection for teleservice access	No
• encrypted data transmission	Yes
• MSC client via GPRS modem with MSC capability	Yes
protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
key length for MSC with Virtual Private Network	128 bit
number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	0
<b>product functions time</b>	
protocol is supported	
• NTP	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes
<b>accessories</b>	
accessories	TS Module RS232 or TS Module MODEM or TS Module ISDN or TS Module GSM pluggable

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## Overview



The SIMATIC RF120C is a communications module for connecting the SIMATIC identification systems directly to the SIMATIC S7-1200. The readers of the RF200/300/1000 RFID systems as well as the MV300/400/500 optical readers can be operated on the SIMATIC RF120C.

Integration into the TIA Portal and the uniform plug-in connection systems permit fast and simple commissioning.

## Ordering data

## Article No.

**SIMATIC RF120C communications module**

Integrated in the S7-1200 PLC for connection of a reader

6GT2002-0LA00

**Accessories for all readers****Reader cable for SIMATIC RF200 / RF300 / MV400**

PUR material, trailable, straight reader connector

2 m

6GT2091-4LH20

5 m

6GT2091-4LH50

10 m

6GT2091-4LN10

**Connecting cable for SIMATIC RF1000**

Prefabricated RS232, between RF1040R or RF1070R and RF120C; black, length 2 m

6GT2891-6UH20

**Connecting cable for SIMATIC MV320**

Pre-assembled, between RF120C and MV320, coiled, length 5 m, usable length 1.6 to 4 m

6GT2191-1BH50

**Accessories for extended use****Extension cable for all readers**

PUR material, trailable.

2 m, straight plug

6GT2891-4FH20

5 m, straight plug

6GT2891-4FH50

10 m, straight plug

6GT2891-4FN10

20 m, straight plug

6GT2891-4FN20

50 m, straight plug

6GT2891-4FN50

2 m, plug angled at reader

6GT2891-4JH20

5 m, plug angled at reader

6GT2891-4JH50

10 m, plug angled at reader

6GT2891-4JN10

# SIMATIC S7-1200 Basic Controllers

I/O modules

Communication

## SIMATIC RF120C

### Technical specifications

Article number	<b>6GT2002-0LA00</b>
product type designation	RF120C communications module
<b>transfer rate</b>	
transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
<b>interfaces</b>	
design of the interface for point-to-point connection	RS422/RS232
number of readers connectable	1
type of electrical connection	
• of the backplane bus	S7-1200 backplane bus
• for supply voltage	Screw terminals
design of the interface to the reader for communication	sub-D, 9-pin, female
<b>mechanical data</b>	
material	Xantar MX 1094
color	Ti-grey 24L01
tightening torque of the screw for securing the equipment maximum	0.45 N·m
<b>supply voltage, current consumption, power loss</b>	
supply voltage	
• at DC rated value	24 V
• at DC	20 ... 30 V
consumed current at DC at 24 V	
• without connected devices typical	0.03 A
• with connected devices maximum	1 A
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
protection class IP	IP20
shock resistance	According to IEC 61131-2
shock acceleration	300 m/s <sup>2</sup>
vibrational acceleration	100 m/s <sup>2</sup>

Article number	<b>6GT2002-0LA00</b>
product type designation	RF120C communications module
<b>design, dimensions and weights</b>	
width	30 mm
height	100 mm
depth	75 mm
net weight	0.15 kg
fastening method	S7-1200 rack
wire length for RS 422 interface maximum	1 000 m
<b>product features, product functions, product components general</b>	
display version	4 LEDs for reader connection, 1 LED for device status
product function addressable transponder file handler	No
protocol is supported	
• S7 communication	Yes
<b>product functions management, configuration, engineering</b>	
type of programming	ID profile, library with functions
type of computer-switched communication	acyclic communication
<b>standards, specifications, approvals</b>	
certificate of suitability	CE, FCC, cULus, KCC, C-Tick, FM
certificate of suitability	
• IECEX	Yes
• for IECEX as marking	Ex: II 3G Ex nAA IIC T4 Gc
MTBF	196 y

3

## Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

### SIPLUS CM 1241 communications module

(Extended temperature range and exposure to media)

Ambient temperature -40 ... +70° C

Communications module for point-to-point connection, with one RS 232 interface

Communications module for point-to-point connection, with one RS 485 interface

Suitable for areas with extreme exposure to media (conformal coating)

Communications module for point-to-point connection, with one RS 232 interface

Communications module for point-to-point connection, with one RS 485 interface

### Accessories

## Article No.

**6AG1241-1AH32-2XB0**

**6AG1241-1CH32-2XB0**

**6AG1241-1AH32-4XB0**

**6AG1241-1CH32-4XB0**

See SIMATIC S7-1200 communications module CM 1241, page 3/128

## Technical specifications

Article number	<b>6AG1241-1AH32-4XB0</b>	<b>6AG1241-1AH32-2XB0</b>	<b>6AG1241-1CH32-4XB0</b>	<b>6AG1241-1CH32-2XB0</b>
Based on	<b>6ES7241-1AH32-0XB0</b> SIPLUS S7-1200 CM 1241 RS232	<b>6ES7241-1AH32-0XB0</b> SIPLUS S7-1200 CM1241 RS232	<b>6ES7241-1CH32-0XB0</b> SIPLUS S7-1200 CM 1241 RS422/485	<b>6ES7241-1CH32-0XB0</b> SIPLUS S7-1200 CM 1241 RS422/485
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; Tmax > 60 °C, derating: Max. one module may be configured; this module must be the last module on the CM bus; minimum clearance on the left side of at least 45 mm
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

# SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS communication

## SIPLUS CM 1241 communications modules

### Technical specifications

Article number	6AG1241-1AH32-4XB0	6AG1241-1AH32-2XB0	6AG1241-1CH32-4XB0	6AG1241-1CH32-2XB0
Based on	6ES7241-1AH32-0XB0 SIPLUS S7-1200 CM 1241 RS232	6ES7241-1AH32-0XB0 SIPLUS S7-1200 CM1241 RS232	6ES7241-1CH32-0XB0 SIPLUS S7-1200 CM 1241 RS422/485	6ES7241-1CH32-0XB0 SIPLUS S7-1200 CM 1241 RS422/485
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**Overview**

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS CB 1241 RS485 communication board**

for point-to-point connection, with 1 RS485 interface

**Accessories****6AG1241-1CH30-5XB1**

See SIMATIC CB 1241 RS485 communication board page 3/130

**Technical specifications**

Article number	<b>6AG1241-1CH30-5XB1</b>
Based on	<b>6ES7241-1CH30-1XB0</b> SIPLUS S7-1200 CB 1241 RS485
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1241-1CH30-5XB1</b>
Based on	<b>6ES7241-1CH30-1XB0</b> SIPLUS S7-1200 CB 1241 RS485
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS communication

### SIPLUS CM 1242-5 communications modules

#### Overview



DP-M	DP-S	FMS	PG/OP	S7
	●			

The SIPLUS CM 1242-5 communications module is used to connect a SIPLUS S7-1200 controller to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without programming device supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of S7-1200 for optimal production.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS S7-1200 CM 1242-5

<b>Article No.</b>	<b>6AG1-242-5DX30-2XE0</b>
<b>Article No. based on</b>	<b>6GK7-242-5DX30-0XE0</b>
Ambient temperature range	-25 ... +55 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Ordering data

#### Article No.

#### SIPLUS communications module CM 1242-5

(Extended temperature range and exposure to media)

Communications module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave

**6AG1242-5DX30-2XE0**

#### Accessories

See SIMATIC S7-1200 CM 1242-5 communications module, page 3/131



**Overview**

The CM 1243-2 communications module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- Indication of the operating state on the front of the device via LED
- Indication of operating mode, AS-Interface voltage faults, configuration faults and I/O faults via LEDs behind the front panel
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-Interface with 30 V voltage and AS-i Power24V: In combination with the optional DCM 1271 data decoupling module, a standard 24 V power supply unit can be used
- Configuration and diagnostics via the TIA Portal

**Installation**

The CM 1243-2 communications module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It incorporates:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals each
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in the scope of supply) can be removed to facilitate installation

**Function**

The CM 1243-2 supports all specified functions of the AS-Interface Specification V3.0.

The values of the digital AS-i slaves can be addressed via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be accessed directly in the process image.

It is also possible to exchange all data of the AS-i master and the connected AS-i slaves with the S7-1200 via the data record interface.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

The optional DCM 1271 data decoupling unit has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A. For more information on DCM 1271, see page 3/135

**Notes on security**

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

For more information about industrial security, please visit <http://www.siemens.com/industrialsecurity>.

**Configuration**

The TIA Portal enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration at the "touch of a button" via the control panel integrated in the TIA Portal/STEP 7.

When operating on a S7-1200 CPU with firmware V4.0 or higher, firmware V1.1 (or higher) is required for the CM 1243-2 module.

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS CM 1243-2 communications module****6AG1243-2AA30-7XB0**

(Extended temperature range and exposure to media)

- AS-Interface master for SIMATIC S7-1200
- Corresponds to AS-Interface Specification V3.0
- With screw terminals, removable terminals (included in the scope of supply)
- Dimensions (W × H × D/ mm)  
30 × 100 × 75

**Accessories**

See S7-1200 CM 1243-2 communications module page 3/134

## SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS communication

### SIPLUS CM 1243-5 communications modules

#### Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

The CM 1243-5 communications module is used to connect a SIMATIC S7-1200 controller to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows the connection of programming devices and operator panels with a PROFIBUS interface to S7-1200
- Module replacement without programming device supported
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of S7-1200 for optimal production.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS S7-1200 CM 1243-5

<b>Article No.</b>	<b>6AG1-243-5DX30-2XE0</b>
<b>Article No. based on</b>	<b>6GK7-243-5DX30-0XE0</b>
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Ordering data

#### Article No.

#### SIPLUS CM 1243-5 communications module

(Extended temperature range and exposure to media)

Communications module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master

**6AG1243-5DX30-2XE0**

#### Accessories

See SIMATIC S7-1200 CM 1243-5 communications module, page 3/137

**Overview**

The CP 1243-1 communications processor is used for connecting the SIMATIC S7-1200 to telecontrol centers via remote networks and telecontrol protocols (DNP3, IEC 60870-5-104, TeleControl Basic), and for safe communication via IP-based networks.

The CP has the following features:

- Ethernet-based connection to TeleControl Server Basic, e.g. via Internet
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures
- Secure communication via VPN connections based on IPSec
- Access protection via Stateful Inspection Firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS CP 1243-1 communications module**

(Extended temperature range and exposure to environmental substances)

Communications processor for connecting SIMATIC S7-1200 as an additional Ethernet interface and for connection to control centers via telecontrol protocols (DNP3, IEC 60870, TeleControl Basic), security (firewall, VPN)

**6AG1243-1BX30-2AX0****Accessories**

See communications processor SIMATIC S7-1200 CP 1243-1, page 3/141

**SIMATIC S7-1200 Basic Controllers**

I/O modules

SIPLUS communication

**SIPLUS CP 1243-1 communications modules****Technical specifications**

Article number	<b>6AG1243-1BX30-2AX0</b>
Based on	<b>6GK7243-1BX30-0XE0</b>
product type designation	SIPLUS S7-1200 CP 1243-1
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	-40 ... +60 °C
• for horizontally arranged busbars during operation	-40 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity	
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)

Article number	<b>6AG1243-1BX30-2AX0</b>
Based on	<b>6GK7243-1BX30-0XE0</b>
product type designation	SIPLUS S7-1200 CP 1243-1
resistance to chemically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity acc. to EN 60721-3-6	Yes
resistance to mechanically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity acc. to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board acc. to EN 61086	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
type of test of the coating acc. to MIL-I-46058C	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	Yes; Conformal coating, class A
protection class IP	IP20

**Overview**

- Unmanaged switch for connecting a SIPLUS S7-1200 controller to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIPLUS S7-1200 controller for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIPLUS S7-1200 mounting rail
- Low-cost solution for implementing small, local Ethernet networks
- Problem-free connection using RJ45 plugs
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS NET CSM 1277**

<b>Article No.</b>	<b>6AG1 277-1AA10-4AA0</b>
<b>Article No. based on</b>	<b>6GK7 277-1AA10-0AA0</b>
Ambient temperature range	0 ... +60 °C

**Ordering data****Article No.****SIPLUS NET CSM 1277 compact switch module**

(Extended temperature range and exposure to media)

Unmanaged switch for connecting a SIPLUS S7-1200 controller and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic device manual on CD-ROM

**6AG1277-1AA10-4AA0****Accessories**

See CSM 1277 unmanaged, page page 3/139

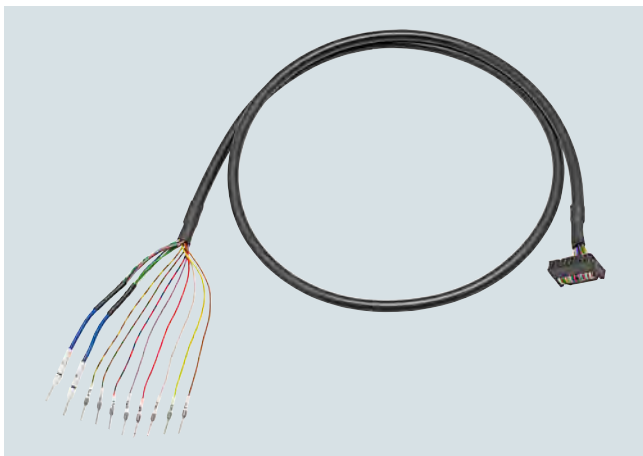
## SIMATIC S7-1200 Basic Controllers

I/O modules

Connection system

### System cabling for SIMATIC S7-1500 IO (25 mm), ET 200SP, S7-1200 and LOGO!

#### Overview



SIMATIC TOP connect universal connecting cable

The wiring of the

- SIMATIC S7-1500 IO (25 mm)
- SIMATIC ET 200SP
- SIMATIC S7-1200
- LOGO!

with the sensors/actuators is a significant factor with respect to time/cost overhead during configuration, control cabinet design, procurement and ease of servicing. The SIMATIC TOP connect system cabling makes connection easy, fast and secure.

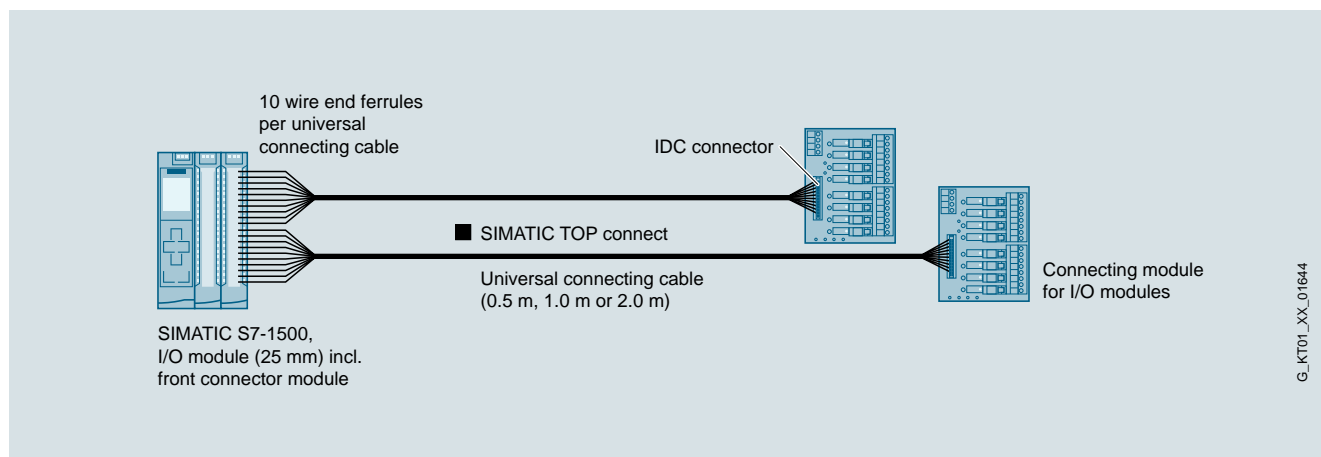
#### Design

The unshielded universal connection cable is offered for a wide range of control cabinet concepts.

It comprises:

- 16-pin round cable with a core diameter of 0.14 mm<sup>2</sup>, pre-assembled with wire end ferrules for connection to the controller:
  - labeled with "0" ... "7" for the control inputs/outputs
  - labeled with "M" for mass
  - labeled with "L+" for 24 V DC potential

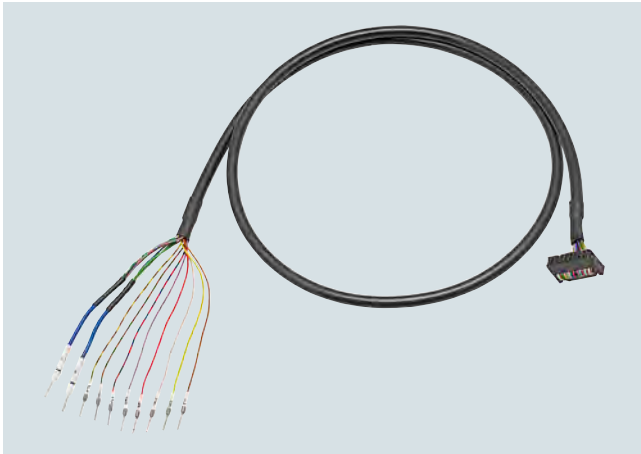
- 16-pin IDC connector (insulation displacement) for connection to the SIMATIC TOP connect terminal modules for 8 I/Os:
  - 3-wire connection using the appropriate terminal module for quick, error-free, wiring
  - Galvanic isolation and adaptation using a coupling relay for easy implementation of potential groups in the system
  - High output current (up to 4 A), even for higher switching frequencies, using an optocoupler module (overload and short-circuit proof)
  - Implementation of isolating terminals using switch modules enabling individual signals to be measured
  - Channel-wise protection of I/Os using a fuse module with a thermal fuse



SIMATIC TOP connect universal connection cable

## System cabling for SIMATIC S7-1500 IO (25 mm), ET 200SP, S7-1200 and LOGO!

## Overview Universal connecting cable



SIMATIC TOP connect universal connecting cable

The universal connecting cable constitutes the link between the standard connection of the SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 or LOGO! and the SIMATIC TOP connect terminal module. It transmits 8 signals and the supply voltage. The connecting cable is available in lengths of 0.5 m / 1.0 m / 2.0 m. the maximum technically feasible length is 30 m.

## Ordering data

## Article No.

Universal connecting cable for  
SIMATIC S7-1500 IO (25 mm),  
SIMATIC ET 200SP,  
SIMATIC S7-1200 and LOGO!

16 x 0.14 mm<sup>2</sup> unshielded

- 0.5 m
- 1.0 m
- 2.0 m

6ES7923-0BA50-0FB0  
6ES7923-0BB00-0FB0  
6ES7923-0BC00-0FB0

## Overview Terminal modules

The terminal modules are used instead of conventional terminal blocks and act as the interface between the controller and signals from the field. All digital modules with 8 I/Os can be used.

## Ordering data

## Article No.

## Terminal module TP1

For 1-wire connection,  
for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0AA20-0AC0  
6ES7924-0AA20-0AA0  
6ES7924-0AA20-0BC0  
6ES7924-0AA20-0BA0

## Terminal module TP3

For 3-wire connection,  
for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs
- Push-in terminals with LEDs and one isolating terminal per channel
- Screw-type terminals with LEDs and one isolating terminal per channel
- Push-in terminals with LEDs and fuse per channel
- Screw-type terminals with LEDs and fuse per channel

6ES7924-0CA20-0AC0  
6ES7924-0CA20-0AA0  
6ES7924-0CA20-0BC0  
6ES7924-0CA20-0BA0  
6ES7924-0CH20-0BC0  
6ES7924-0CH20-0BA0  
6ES7924-0CL20-0BC0  
6ES7924-0CL20-0BA0

## Terminal module TPRo

Relay module for 8 outputs,  
relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BD20-0BC0  
6ES7924-0BD20-0BA0

## Terminal module TPRI

Relay module for 8 inputs  
(1230 V AC), relay as normally  
open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BE20-0BC0  
6ES7924-0BE20-0BA0

## Terminal module TPRI

Relay module for 8 inputs  
(110 V AC), relay as normally  
open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BG20-0BC0  
6ES7924-0BG20-0BA0

## Terminal module TP0o

Optocoupler module for 8 outputs  
(max. 24 V DC/4 A)

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BF20-0BC0  
6ES7924-0BF20-0BA0

## SIMATIC S7-1200 Basic Controllers

I/O modules

Fail-safe I/O modules

### SM 1226 fail-safe digital input

#### Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFI-safe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

#### Ordering data

#### Article No.

##### SM 1226 fail-safe digital input signal module

16 inputs, 24 V DC (SIL 2/category 3/PL d) or 8 inputs 24 V DC (SIL 3/category 3 or category 4/PL e) or a combination of both

6ES7226-6BA32-0XB0

##### Accessories

##### Terminal block (spare part)

With 11 screws, tin-coated; 4 units

6ES7292-1AL30-0XA0

##### Front flap set (spare part)

For modules with a width of 70 mm

6ES7291-1BB30-0XA0

##### STEP 7 Safety Advanced V17

###### Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

###### Requirement:

STEP 7 Professional V17

###### Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA17-0YA5

Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery

6ES7833-1FA17-0YH5

##### STEP 7 Safety Basic V17

###### Task:

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC

###### Requirement:

STEP 7 Basic V17 and higher

###### Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FB17-0YA5

Floating license for 1 user; license key for download<sup>1)</sup>; email address required for delivery

6ES7833-1FB17-0YH5

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



## Technical specifications

Article number	<b>6ES7226-6BA32-0XB0</b> Digital Input SM 1226, F-DI 16x 24VDC
<b>General information</b>	
Product type designation	SM 1226, F-DI 16x24 V DC
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
from backplane bus 5 V DC, max.	155 mA; Current consumption (SM Bus, 5 V DC): 155 mA
<b>Digital inputs</b>	
• from load voltage L+ (without load), max.	130 mA; 130 mA + 6 mA / input used + any Vs1/Vs2 current used
<b>Digital inputs</b>	
Number of digital inputs	16; 16 (1oo1) or 8 (1oo2); Note: You can individually assign each pair of inputs "a.x" and "b.x" as a single (1oo2)-channel or as 2 separate (1oo1)-channels
<b>horizontal installation</b>	
- up to 50 °C, max.	16; 16 inputs at 55 °C horizontal
<b>vertical installation</b>	
- up to 40 °C, max.	16; 16 inputs at 45 °C vertical
<b>Input voltage</b>	
• for signal "0"	-30 V DC to +5 V DC
• for signal "1"	15 V DC to 30 V DC
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	0.5 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes

Article number	<b>6ES7226-6BA32-0XB0</b> Digital Input SM 1226, F-DI 16x 24VDC
<b>Standards, approvals, certificates</b>	
CE mark	Yes
cULus	Yes
FM approval	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	1-channel, Category 3, PL d; 2-channel, Category 3 or 4, PL e
• SIL acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	70 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	250 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

Fail-safe I/O modules

### SM 1226 fail-safe digital output

#### Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

#### Ordering data

#### Article No.

##### SM 1226 fail-safe digital output signal module

6ES7226-6DA32-0XB0

4 outputs; 24 V DC, switching to P/M potential

##### Accessories

##### Terminal block (spare part)

With 11 screws, tin-coated; 4 units

6ES7292-1AL30-0XA0

##### Front flap set (spare part)

For modules with a width of 70 mm

6ES7291-1BB30-0XA0

##### STEP 7 Safety Advanced V17

###### Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

###### Requirement:

STEP 7 Professional V17

###### Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA17-0YA5

Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery

6ES7833-1FA17-0YH5

##### STEP 7 Safety Basic V17

###### Task:

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC

###### Requirement:

STEP 7 Basic V17 and higher

###### Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FB17-0YA5

Floating license for 1 user; license key for download<sup>1)</sup>; email address required for delivery

6ES7833-1FB17-0YH5

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Technical specifications

Article number	<b>6ES7226-6DA32-0XB0</b> Digital Output SM 1226, F-DQ 4x 24VDC
<b>General information</b>	
Product type designation	SM 1226 F-DQ 4x 24 VDC
<b>Input current</b>	
from backplane bus 5 V DC, max.	125 mA
<b>Digital outputs</b>	
• from load voltage L+, max.	170 mA
<b>Digital outputs</b>	
Number of digital outputs	4
• in groups of	1
Short-circuit protection	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	30 Hz
• on lamp load, max.	10 Hz
<b>Output voltage</b>	
• Rated value (DC)	24 V
<b>Output current</b>	
• for signal *I* rated value	2 A
• for signal *O* residual current, max.	P-switch: 0.5 mA, maximum; M-switch: 0.5 mA, maximum
<b>Diagnostics indication LED</b>	
• for status of the outputs	Yes

Article number	<b>6ES7226-6DA32-0XB0</b> Digital Output SM 1226, F-DQ 4x 24VDC
<b>Standards, approvals, certificates</b>	
CE mark	Yes
cULus	Yes
FM approval	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	Category 4, PL e
• SIL acc. to IEC 61508	SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	70 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	270 g

**SIMATIC S7-1200 Basic Controllers**

I/O modules

Fail-safe I/O modules

**SM 1226 fail-safe relay output****Overview**

- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

**Ordering data****Article No.**

**SM 1226 fail-safe relay output signal module** **6ES7226-6RA32-0XB0**

2 relay outputs

**Accessories****Terminal block (spare part)**

With 11 screws, tin-coated, coded; 4 units

**6ES7292-1AL40-0XA0****Front flap set (spare part)**

For modules with a width of 70 mm

**6ES7291-1BB30-0XA0****STEP 7 Safety Advanced V17****Task:**

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

**Requirement:**

STEP 7 Professional V17

**Note:**

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

**6ES7833-1FA17-0YA5**Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery**6ES7833-1FA17-0YH5****STEP 7 Safety Basic V17****Task:**

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC

**Requirement:**

STEP 7 Basic V17 and higher

**Note:**

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

**6ES7833-1FB17-0YA5**Floating license for 1 user; license key for download<sup>1)</sup>; email address required for delivery**6ES7833-1FB17-0YH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Technical specifications

Article number	<b>6ES7226-6RA32-0XB0</b> Digital Output SM 1226, F-DQ 2x Relay
<b>General information</b>	
Product type designation	SM 1226, F-DQ 2x relay/5 A
<b>Input current</b>	
from backplane bus 5 V DC, max.	120 mA
<b>Digital outputs</b>	
• from load voltage L+, max.	300 mA
<b>Digital outputs</b>	
Number of digital outputs	2
Short-circuit protection	No
<b>Output voltage</b>	
• Rated value (DC)	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC
<b>Relay outputs</b>	
• Number of relay outputs	2; 2 circuits per output
<b>Switching capacity of contacts</b>	
- with inductive load, max.	0.1 Hz, accordance with IEC 60947-5-1, DC-13; 2 Hz, accordance with IEC 60947-5-1, AC-15
- with resistive load, max.	2 Hz
<b>Diagnostics indication LED</b>	
• for status of the outputs	Yes

Article number	<b>6ES7226-6RA32-0XB0</b> Digital Output SM 1226, F-DQ 2x Relay
<b>Standards, approvals, certificates</b>	
CE mark	Yes
cULus	Yes
FM approval	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	Category 4, PL e
• SIL acc. to IEC 61508	SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	70 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	300 g

## SIMATIC S7-1200 Basic Controllers

I/O modules

SIPLUS Fail-safe digital inputs and outputs

### SIPLUS SM 1226 fail-safe digital input

#### Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

#### Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

#### SIPLUS SM 1226 fail-safe digital input signal module

(Extended temperature range and environmental stress)

16 inputs, 24 V DC (SIL 2/category 3/PL d) or 8 inputs 24 V DC (SIL 3/category 3 or category 4/PL e) or a combination of both

#### Accessories

6AG1226-6BA32-5XB0

See SIMATIC SM 1226 fail-safe digital input signal module, page 3/164

#### Technical specifications

Article number	<b>6AG1226-6BA32-5XB0</b>
Based on	<b>6ES7226-6BA32-0XB0</b> SIPLUS S7-1200 SM 1226 F-DI 16x24VDC
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

# SIMATIC S7-1200 Basic Controllers

## I/O modules

### SIPLUS Fail-safe digital inputs and outputs

#### SIPLUS SM 1226 fail-safe digital output

### Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

#### Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

### Ordering data

Ordering data	Article No.
<b>SIPLUS SM 1226 fail-safe digital output module</b> 4 outputs; 24 V DC, switching to P/M potential	<b>6AG1226-6DA32-5XB0</b>
<b>Accessories</b>	See SIMATIC SM 1226 fail-safe digital output signal module, page 3/166

### Technical specifications

Article number	<b>6AG1226-6DA32-5XB0</b>
Based on	<b>6ES7226-6DA32-0XB0</b> SIPLUS S7-1200 SM 1226 F-DQ 4x24VDC
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

**SIMATIC S7-1200 Basic Controllers**

I/O modules

SIPLUS Fail-safe digital inputs and outputs

**SIPLUS SM 1226 fail-safe relay output****Overview**

- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

**Note**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS SM 1226 fail-safe relay output signal module****6AG1226-6RA32-5XB0**

2 relay outputs

**Accessories**

See SIMATIC SM 1226 fail-safe relay output signal module, page 3/168

**Technical specifications**

Article number	<b>6AG1226-6RA32-5XB0</b>
Based on	<b>6ES7226-6RA32-0XB0</b> SIPLUS S7-1200 SM 1226 F-DQ 2xRelay
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A



### Overview



In terms of design and functionality, the SIMATIC PM 1207 single-phase load power supply (PM = power module) with automatic range selection of the input voltage is an optimal match to the SIMATIC S7-1200 PLC. It provides the supply to CPUs with 24 V input as well as to signal modules, and to 24 V loads connected to the modules. Comprehensive certifications such as UL and DNV GL enable universal use.

### Ordering data

### Article No.

#### SIMATIC S7-1200 PM 1207

Input: 120/230 V AC  
Output: 24 V DC/2.5 A

6EP1332-1SH71

### Technical specifications

Article number	<b>6EP1332-1SH71</b>
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
<b>Input</b>	
Input	1-phase AC
• Note	Automatic range selection
supply voltage	
• 1 at AC rated value	120 V
• 2 at AC rated value	230 V
input voltage	
• 1 at AC	85 ... 132 V
• 2 at AC	176 ... 264 V
Wide-range input	No
Overvoltage resistance	2.3 × Vin rated, 1.3 ms
Mains buffering	at Vin = 93/187 V
Mains buffering at Iout rated, min.	20 ms; at Vin = 93/187 V
Rated line frequency 1	50 Hz
Rated line frequency 2	60 Hz
Rated line range	47 ... 63 Hz
input current	
• at rated input voltage 120 V	1.2 A
• at rated input voltage 230 V	0.67 A
Switch-on current limiting (+25 °C), max.	13 A
duration of inrush current limiting at 25 °C	
• maximum	3 ms
I <sup>2</sup> t, max.	0.5 A <sup>2</sup> ·s
Built-in incoming fuse	T 3, 15 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C
<b>Output</b>	
Output	Controlled, isolated DC voltage
Rated voltage $U_{out}$ DC output voltage at output 1 at DC rated value	24 V
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.1 %
Static load balancing, approx.	0.2 %
Residual ripple peak-peak, max.	150 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	240 mV
product function output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
On/off behavior	No overshoot of Vout (soft start)
Startup delay, max.	6 s; 2 s at 230 V, 6 s at 120 V
Voltage rise, typ.	10 ms
Rated current value Iout rated	2.5 A

# SIMATIC S7-1200 Basic Controllers

## Power supplies

### 1-phase, 24 V DC (for S7-1200)

#### Technical specifications

Article number	<b>6EP1332-1SH71</b>
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Current range	0 ... 2.5 A
supplied active power typical	60 W
short-term overload current	
• on short-circuiting during the start-up typical	6 A
• at short-circuit during operation typical	6 A
duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
Parallel switching for enhanced performance	Yes
Numbers of parallel switchable units for enhanced performance	2
<b>Efficiency</b>	
Efficiency at $U_{out}$ rated, $I_{out}$ rated, approx.	83 %
Power loss at $U_{out}$ rated, $I_{out}$ rated, approx.	12 W
<b>Closed-loop control</b>	
Dynamic mains compensation ( $U_{in}$ rated $\pm 15$ %), max.	0.3 %
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %), $U_{out} \pm$ typ.	3 %
Load step setting time 50 to 100%, typ.	5 ms
Load step setting time 100 to 50%, typ.	5 ms
setting time maximum	5 ms
<b>Protection and monitoring</b>	
Output overvoltage protection	< 33 V
Current limitation, typ.	2.65 A
property of the output short-circuit proof	Yes
Short-circuit protection	Constant current characteristic
enduring short circuit current RMS value	
• typical	2.7 A
Overload/short-circuit indicator	-
<b>Safety</b>	
Primary/secondary isolation	Yes
galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class I
leakage current	
• maximum	3.5 mA
Degree of protection (EN 60529)	IP20

Article number	<b>6EP1332-1SH71</b>
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
<b>Approvals</b>	
CE mark	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950-1, CSA C22.2 No. 60950-1) File E151273
Explosion protection	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455
certificate of suitability NEC Class 2	No
FM approval	Class I, Div. 2, Group ABCD, T4
CB approval	Yes
certificate of suitability EAC approval	Yes
Marine approval	ABS, BV, DNV GL, LRS, NK
<b>EMC</b>	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	not applicable
Noise immunity	EN 61000-6-2
<b>environmental conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
- Note	with natural convection
• during transport	-40 ... +85 °C
• during storage	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>	
Connection technology	screw-type terminals
Connections	
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-
width of the enclosure	70 mm
height of the enclosure	100 mm
depth of the enclosure	75 mm
required spacing	
• top	20 mm
• bottom	20 mm
• left	0 mm
• right	0 mm
Weight, approx.	0.3 kg
product feature of the enclosure housing can be lined up	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting
MTBF at 40 °C	1 492 537 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

### Overview



- Stabilized power supply for SIPLUS S7-1200
- In the S7-1200 design
- Input 120/230 V AC, output 24 V DC, 2.5 A (derating: 1.5 A above 60 °C)

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS power supply PM 1207

Article No.	6AG1 332-1SH71-4AA0	6AG1 332-1SH71-7AA0
Article No. based on	6EP1 332-1SH71	
Ambient temperature range	0 ... +60° C	-40 ... +70° C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical specifications	The technical data of the standard product applies except for the ambient conditions.	
<b>Ambient conditions</b>		
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.	
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!	
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!	
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K	

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**SIMATIC S7-1200 Basic Controllers**

## SIPLUS power supplies

**1-phase, 24 V DC (for SIPLUS S7-1200)****Ordering data****Article No.****SIPLUS S7-1200 PM 1207  
power supply**(Extended temperature range  
and exposure to media)Input 120/230 V AC,  
output 24 V DC, 2.5 A;  
derating from +55 °C to +70 °C  
to 1.2 A output currentAmbient temperature  
-25 ... +70 °CAmbient temperature  
0 ... +60 °C**6AG1332-1SH71-7AA0****6AG1332-1SH71-4AA0****Technical specifications**

	<b>SIPLUS PM 1207</b>
Article No.	<b>6AG1332-1SH71-7AA0</b> <b>6AG1332-1SH71-4AA0</b>
Article No. based on	<b>6EP1332-1SH71</b>
Input voltage, nominal value	120/230 V AC (auto-switching)
• Range	85 ... 132 V/176 ... 264 V AC
Mains buffering	> 20 ms (at 93/187 V)
Line frequency, nominal	50/60 Hz
• Range	47 ... 63 Hz
Input current, nominal value	1.2/0.67 A
• Inrush current (25 °C)	< 13 A
• Recommended circuit-breaker	16 A Charact. B, 10 A Charact. C
Output voltage, nominal value	24 V DC
• Tolerance	± 3%
• Residual ripple	< 150 mVpp
• Adjustment	No
Output current, nominal value	2.5 A (derating: 1.5 A above 60 °C)
Efficiency at nominal values, approx.	83%
Parallel operation	Yes, 2 units
Electronic short-circuit protection	Yes, automatic restart
Radio interference suppression (EN 55022)	Class B
Operating display	Green LED for "24 V o.k."
Supply-harmonics limitation (EN 61000-3-2)	Not applicable
Degree of protection (EN 60529)	IP20
Protection class	Class 1
Electric isolation	SELV acc. to EN 60950 and EN 50178
Ambient temperature	0 ... +60 °C -40 ... +70 °C
Transport and storage temperature	-40 ... +85 °C
Installation	DIN rail EN 60715 35x7.5/15
Dimensions (W x H x D) in mm	70 x 100 x 75
Weight, approx.	0.3 kg
Certifications	CE

## Overview

**Basic Panels (2<sup>nd</sup> Generation)**

SIMATIC HMI Basic Panels (2<sup>nd</sup> Generation) with their fully developed HMI basic functions are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive as well as the manual backup and restoring of the complete panel.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

<http://www.siemens.com/basic-panels>

## Ordering data

## Article No.

Ordering data	Article No.
<b>SIMATIC HMI Basic Panels (2<sup>nd</sup> Generation)</b>	
<b>Key and touch devices</b>	
<b>SIMATIC HMI KTP400 Basic</b> Key/touch-screen operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	6AV2123-2DB03-0AX0
<b>SIMATIC HMI TP400 Basic Keyless</b> Touch screen operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	6AV2143-6DB00-0AA0
<b>SIMATIC HMI KTP700 Basic</b> Key/touch-screen operation; 7" TFT display, 65 536 colors, PROFINET interface	6AV2123-2GB03-0AX0
<b>SIMATIC HMI KTP700 Basic DP</b> Key/touch-screen operation; 7" TFT display, 65 536 colors, PROFIBUS interface	6AV2123-2GA03-0AX0
<b>SIMATIC HMI TP700 Basic Keyless</b> Touch screen operation; 7" TFT display, 65 536 colors, PROFINET interface	6AV2143-6GB00-0AA0
<b>SIMATIC HMI KTP900 Basic</b> Key/touch-screen operation; 9" TFT display, 65 536 colors, PROFINET interface	6AV2123-2JB03-0AX0
<b>SIMATIC HMI TP900 Basic Keyless</b> Touch screen operation; 9" TFT display, 65 536 colors, PROFINET interface	6AV2143-6JB00-0AA0
<b>SIMATIC HMI KTP1200 Basic</b> Key/touch-screen operation; 12" TFT display, 65 536 colors, PROFINET interface	6AV2123-2MB03-0AX0
<b>SIMATIC HMI KTP1200 Basic DP</b> Key/touch-screen operation; 12" TFT display, 65 536 colors, PROFIBUS interface	6AV2123-2MA03-0AX0
<b>Starter kits</b>	
<b>Starter kit LOGO! + KP300 Basic mono PN</b>	6AV2132-0HA00-0AA1
<b>Starter kit LOGO! + KTP400 Basic</b>	6AV2132-0KA00-0AA1
<b>Starter kit LOGO! + KTP700 Basic</b>	6AV2132-3GB00-0AA1
Starter kits with a LOGO! consist of: <ul style="list-style-type: none"> <li>the respective SIMATIC HMI Basic Panel</li> <li>SIMATIC HMI KP300 Basic mono PN</li> <li>SIMATIC HMI KTP400 Basic</li> <li>SIMATIC HMI KTP700 Basic</li> <li>LOGO! 12/24 RCE</li> <li>LOGO! POWER 24 V 1,3 A</li> <li>LOGO! SOFT COMFORT V7</li> <li>WINCC BASIC (TIA Portal)</li> <li>Ethernet CAT5 cable, 2 m</li> </ul>	
<b>Documentation</b>	
Additional information on the manual for the Basic Panels is available on the Internet at:	<a href="http://support.automation.siemens.com">http://support.automation.siemens.com</a>
<b>Accessories</b>	See Catalog ST 80 / ST PC or Industry Mall

## SIMATIC S7-1200 Basic Controllers

Operator control and monitoring  
Comfort Panels

### Comfort Panels Standard devices

#### Overview



#### SIMATIC HMI Comfort Panels - Standard devices

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFlenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Data security in the event of a power failure for the device and for the SIMATIC HMI memory card
- Innovative service and commissioning concept
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- All versions can be used as an OPC UA client or as a server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal engineering framework

#### Note:

A 7" and a 15" Comfort Outdoor version are available. These devices have been specially designed for outdoor applications in difficult environments. Best display quality, even under sunlight, UV-resistant fronts and much more.

For more information, please go to:

<http://www.siemens.com/comfort-panels>

#### Ordering data

#### Article No.

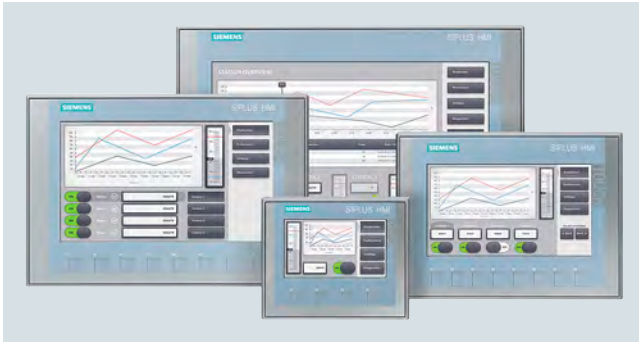
<b>SIMATIC HMI Comfort Panels</b>	
<b>Key and touch devices</b>	
<b>SIMATIC HMI KTP400 Comfort</b> Key/touch-screen operation; 4" widescreen display	<b>6AV2124-2DC01-0AX0</b>
<b>Touch devices</b>	
<b>SIMATIC HMI TP700 Comfort</b> Touch-screen operation; 7" widescreen display	<b>6AV2124-0GC01-0AX0</b>
<b>SIMATIC HMI TP900 Comfort</b> Touch-screen operation; 9" widescreen display	<b>6AV2124-0JC01-0AX0</b>
<b>SIMATIC HMI TP1200 Comfort</b> Touch-screen operation; 12" widescreen display	<b>6AV2124-0MC01-0AX0</b>
<b>SIMATIC HMI TP1500 Comfort</b> Touch-screen operation; 15" widescreen display	<b>6AV2124-0QC02-0AX1</b>
<b>SIMATIC HMI TP1900 Comfort</b> Touch-screen operation; 19" widescreen display	<b>6AV2124-0UC02-0AX1</b>
<b>SIMATIC HMI TP2200 Comfort</b> Touch-screen operation; 22" widescreen display	<b>6AV2124-0XC02-0AX1</b>
<b>Key devices</b>	
<b>SIMATIC HMI KP400 Comfort</b> Key operation; 4" widescreen display	<b>6AV2124-1DC01-0AX0</b>
<b>SIMATIC HMI KP700 Comfort</b> Key operation; 7" widescreen display	<b>6AV2124-1GC01-0AX0</b>
<b>SIMATIC HMI KP900 Comfort</b> Key operation; 9" widescreen display	<b>6AV2124-1JC01-0AX0</b>
<b>SIMATIC HMI KP1200 Comfort</b> Key operation; 12" widescreen display	<b>6AV2124-1MC01-0AX0</b>
<b>SIMATIC HMI KP1500 Comfort</b> Key operation; 15" widescreen display	<b>6AV2124-1QC02-0AX1</b>
<b>Accessories</b>	See Catalog ST 80 / ST PC or Industry Mall

# SIMATIC S7-1200 Basic Controllers

## SIPLUS operator control and monitoring

### SIPLUS Basic Panels (2nd Generation)

#### Overview



With their fully developed HMI basic functions, 2<sup>nd</sup> Generation SIPLUS Basic Panels are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Technical documentation on SIPLUS can be found here: <http://www.siemens.com/siplus-extreme>

#### Ordering data

#### Article No.

##### SIPLUS HMI Basic Panels, Key and Touch

##### SIPLUS HMI KTP400 Basic

**6AG1123-2DB03-2AX0**

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C

##### SIPLUS HMI KTP700 Basic

**6AG1123-2GB03-2AX0**

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C

##### SIPLUS HMI KTP700 Basic DP

**6AG1123-2GA03-2AX0**

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C

##### SIPLUS HMI KTP900 Basic

**6AG1123-2JB03-2AX0**

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C

##### SIPLUS HMI KTP1200 Basic

**6AG1123-2MB03-2AX0**

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C

##### SIPLUS HMI KTP1200 Basic DP

**6AG1123-2MA03-2AX0**

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C

#### Accessories

See Catalog ST 80 / ST PC or Industry Mall

#### Technical specifications

Article number	<b>6AG1123-2DB03-2AX0</b>	<b>6AG1123-2GB03-2AX0</b>	<b>6AG1123-2GA03-2AX0</b>
Based on	<b>6AV2123-2DB03-0AX0</b> SIPLUS HMI KTP400 BASIC	<b>6AV2123-2GB03-0AX0</b> SIPLUS HMI KTP700 BASIC	<b>6AV2123-2GA03-0AX0</b> SIPLUS HMI KTP700 BASIC DP
<b>Ambient conditions</b>			
Suited for indoor use		Yes	Yes
Suited for outdoor use		No	No
<b>Ambient temperature during operation</b>			
• Operation (vertical installation)			
- For vertical installation, min.	-20 °C; = Tmin	-20 °C	-20 °C; = Tmin
- For vertical installation, max.	60 °C; = Tmax	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position

# SIMATIC S7-1200 Basic Controllers

## SIPLUS operator control and monitoring

### SIPLUS Basic Panels (2nd Generation)

#### Technical specifications

Article number	<b>6AG1123-2DB03-2AX0</b>	<b>6AG1123-2GB03-2AX0</b>	<b>6AG1123-2GA03-2AX0</b>
Based on	<b>6AV2123-2DB03-0AX0</b> SIPLUS HMI KTP400 BASIC	<b>6AV2123-2GB03-0AX0</b> SIPLUS HMI KTP700 BASIC	<b>6AV2123-2GA03-0AX0</b> SIPLUS HMI KTP700 BASIC DP
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
<b>Article number</b>			
<b>6AG1123-2JB03-2AX0</b>			
<b>Based on</b>			
<b>6AV2123-2JB03-0AX0</b> SIPLUS HMI KTP900 BASIC			
<b>6AG1123-2MB03-2AX0</b>			
<b>6AV2123-2MB03-0AX0</b> SIPLUS HMI KTP1200 BASIC			
<b>6AG1123-2MA03-2AX0</b>			
<b>6AV2123-2MA03-0AX0</b> SIPLUS HMI KTP1200 BASIC DP			
<b>Ambient conditions</b>			
Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
<b>Ambient temperature during operation</b>			
• Operation (vertical installation)			
- For vertical installation, min.	-20 °C	-10 °C; = Tmin	-10 °C; = Tmin
- For vertical installation, max.	50 °C	50 °C	50 °C



### Technical specifications

Article number	6AG1123-2JB03-2AX0	6AG1123-2MB03-2AX0	6AG1123-2MA03-2AX0
Based on	6AV2123-2JB03-0AX0	6AV2123-2MB03-0AX0	6AV2123-2MA03-0AX0
	SIPLUS HMI KTP900 BASIC	SIPLUS HMI KTP1200 BASIC	SIPLUS HMI KTP1200 BASIC DP
<b>Altitude during operation relating to sea level</b> <ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b> <ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position
<b>Resistance</b>			
<b>Coolants and lubricants</b> <ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b> <ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b> <ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b> <ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b> <ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b> <ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A

## SIMATIC S7-1200 Basic Controllers

SIPLUS operator control and monitoring

### SIPLUS Basic Panels (1st Generation)

#### Overview



- Ideal entry-level series of 3.8" to 15" for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS 485/422

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Technical documentation on SIPLUS can be found here:  
<http://www.siemens.com/siplus-extreme>

#### Ordering data

#### Article No.

##### SIPLUS HMI KP300 Basic mono PN

6AG1647-0AH11-2AX0

For areas with extreme exposure to media (conformal coating);  
 ambient temperature -25 ... +60 °C

##### SIPLUS HMI KTP400 Basic mono PN

6AG1647-0AA11-2AX0

For areas with extreme exposure to media (conformal coating);  
 ambient temperature -10 ... +60 °C

##### Accessories

See Catalog ST 80 / ST PC or Industry Mall

### Technical specifications

Article number	<b>6AG1647-0AH11-2AX0</b>	<b>6AG1647-0AA11-2AX0</b>
Based on	<b>6AV6647-0AH11-3AX0</b> SIPLUS HMI KP300 BASIC MONO PN 3,6"	<b>6AV6647-0AA11-3AX0</b> SIPLUS KTP400 BASIC MONO PN 3,8"
<b>Ambient conditions</b>		
Suited for indoor use	Yes	Yes
Suited for outdoor use	No	No
<b>Ambient temperature during operation</b>		
• Operation (vertical installation)		
- For vertical installation, min.	-25 °C	-10 °C
- For vertical installation, max.	60 °C	60 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## SIMATIC S7-1200 Basic Controllers

### SIPLUS operator control and monitoring

#### SIPLUS Comfort Panels Standard

##### Overview



- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available
- Data security in the event of a power failure for the device and for the SIMATIC HMI memory card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Easy project transfer via standard cable (standard Ethernet cable, standard USB cable)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2x PROFINET with integrated switch for 7" models or larger; plus 1 additional PROFINET with Gigabit support for 15" models or larger
- All variants can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- Key-operated devices with stamped keys for optimum tactile feedback
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

##### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

##### Ordering data

##### Article No.

<b>SIPLUS HMI Comfort Panels, Keys and Touch</b>	
<b>SIPLUS HMI KTP400 Comfort</b>	<b>6AG1124-2DC01-4AX0</b>
<b>SIPLUS HMI Comfort Panels, Touch</b>	
<b>SIPLUS HMI TP700 Comfort</b>	<b>6AG1124-0GC01-4AX0</b>
<b>SIPLUS HMI TP900 Comfort</b>	<b>6AG1124-0JC01-4AX0</b>
<b>SIPLUS HMI TP1200 Comfort</b>	<b>6AG1124-0MC01-4AX0</b>
<b>SIPLUS HMI TP1500 Comfort</b>	<b>6AG1124-0QC02-4AX1</b>
<b>SIPLUS HMI TP1900 Comfort</b>	<b>6AG1124-0UC02-4AX1</b>
<b>SIPLUS HMI TP2200 Comfort</b>	<b>6AG1124-0XC02-4AX1</b>
<b>SIPLUS HMI Comfort Panels, Keys</b>	
<b>SIPLUS HMI KP400 Comfort</b>	<b>6AG1124-1DC01-4AX0</b>
<b>SIPLUS HMI KP700 Comfort</b>	<b>6AG1124-1GC01-4AX0</b>
<b>SIPLUS HMI KP900 Comfort</b>	<b>6AG1124-1JC01-4AX0</b>
<b>SIPLUS HMI KP1200 Comfort</b>	<b>6AG1124-1MC01-4AX0</b>
<b>SIPLUS HMI KP1500 Comfort</b>	<b>6AG1124-1QC02-4AX1</b>
<b>Accessories</b>	See Catalog ST 80 / ST PC or Industry Mall

### Technical specifications

Article number	<b>6AG1124-2DC01-4AX0</b>	<b>6AG1124-0GC01-4AX0</b>	<b>6AG1124-0JC01-4AX0</b>	<b>6AG1124-0MC01-4AX0</b>
Based on	<b>6AV2124-2DC01-0AX0</b> SIPLUS HMI KTP400 COMFORT	<b>6AV2124-0GC01-0AX0</b> SIPLUS HMI TP700 COMFORT	<b>6AV2124-0JC01-0AX0</b> SIPLUS HMI TP900 COMFORT	<b>6AV2124-0MC01-0AX0</b> SIPLUS HMI TP1200 COMFORT
<b>Ambient conditions</b>				
Suited for indoor use	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No
<b>Ambient temperature during operation</b>				
• Operation (vertical installation)				
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

# SIMATIC S7-1200 Basic Controllers

## SIPLUS operator control and monitoring

### SIPLUS Comfort Panels Standard

#### Technical specifications

Article number	6AG1124-2DC01-4AX0	6AG1124-0GC01-4AX0	6AG1124-0JC01-4AX0	6AG1124-0MC01-4AX0	
Based on	6AV2124-2DC01-0AX0 SIPLUS HMI KTP400 COMFORT	6AV2124-0GC01-0AX0 SIPLUS HMI TP700 COMFORT	6AV2124-0JC01-0AX0 SIPLUS HMI TP900 COMFORT	6AV2124-0MC01-0AX0 SIPLUS HMI TP1200 COMFORT	
<b>Conformal coating</b>					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	
Article number	6AG1124-1DC01-4AX0	6AG1124-1GC01-4AX0	6AG1124-1JC01-4AX0	6AG1124-1MC01-4AX0	6AG1124-1QC02-4AX1
Based on	6AV2124-1DC01-0AX0 SIPLUS HMI KP400 COMFORT	6AV2124-1GC01-0AX0 SIPLUS HMI KP700 COMFORT	6AV2124-1JC01-0AX0 SIPLUS HMI KP900 COMFORT	6AV2124-1MC01-0AX0 SIPLUS HMI KP1200 COMFORT	6AV2124-1QC02-0AX1 SIPLUS HMI KP1500 Comfort
<b>Ambient conditions</b>					
Suited for indoor use	Yes	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No	No
<b>Ambient temperature during operation</b>					
• Operation (vertical installation)					
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; (55 °C, see entry ID: 64847814)
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>					
<b>Coolants and lubricants</b>					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

# SIMATIC S7-1200 Basic Controllers

## SIPLUS operator control and monitoring

### SIPLUS Comfort Panels Standard

#### Technical specifications

Article number	<b>6AG1124-1DC01-4AX0</b>	<b>6AG1124-1GC01-4AX0</b>	<b>6AG1124-1JC01-4AX0</b>	<b>6AG1124-1MC01-4AX0</b>	<b>6AG1124-1QC02-4AX1</b>
Based on	<b>6AV2124-1DC01-0AX0</b> SIPLUS HMI KP400 COMFORT	<b>6AV2124-1GC01-0AX0</b> SIPLUS HMI KP700 COMFORT	<b>6AV2124-1JC01-0AX0</b> SIPLUS HMI KP900 COMFORT	<b>6AV2124-1MC01-0AX0</b> SIPLUS HMI KP1200 COMFORT	<b>6AV2124-1QC02-0AX1</b> SIPLUS HMI KP1500 Comfort
<b>Use on ships/at sea</b>					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	<b>6AG1124-0QC02-4AX1</b>	<b>6AG1124-0UC02-4AX1</b>	<b>6AG1124-0XC02-4AX1</b>		
Based on	<b>6AV2124-0QC02-0AX1</b> SIPLUS HMI TP1500 Comfort	<b>6AV2124-0UC02-0AX1</b> SIPLUS HMI TP1900 Comfort	<b>6AV2124-0XC02-0AX1</b> SIPLUS HMI TP2200 Comfort		
<b>Ambient conditions</b>					
Suited for indoor use	Yes	Yes	Yes		
Suited for outdoor use	No	No	No		
<b>Ambient temperature during operation</b>					
• Operation (vertical installation)					
- For vertical installation, min.	0 °C	0 °C; = Tmin	0 °C; = Tmin		
- For vertical installation, max.	50 °C; (55 °C, see entry ID: 64847814)	45 °C; = Tmax	45 °C; = Tmax		

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## SIPLUS operator control and monitoring

### SIPLUS Comfort Panels Standard

#### Technical specifications

Article number	6AG1124-0QC02-4AX1	6AG1124-0UC02-4AX1	6AG1124-0XC02-4AX1
Based on	6AV2124-0QC02-0AX1	6AV2124-0UC02-0AX1	6AV2124-0XC02-0AX1
	SIPLUS HMI TP1500 Comfort	SIPLUS HMI TP1900 Comfort	SIPLUS HMI TP2200 Comfort
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A



### Overview

SIMATIC S7-1200 Starter Kits make it quick and easy to implement simple automation tasks. The various packages allow flexible and efficient implementation of different tasks, from engineering with the TIA Portal, to the integration of HMI Panels, all the way to solutions for fail-safe applications.

The following are available:

- Starter Kit CPU 1212C AC/DC/relay;  
Complete offer SIMATIC S7-1200, starter box, consisting of: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, info material, in Systainer
- SIMATIC S7-1200 + KP300 Basic Starter Kit;  
Consisting of:  
CPU 1212C AC/DC/relay, HMI KP300 Basic mono PN, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer
- SIMATIC S7-1200 + KTP400 Basic Starter Kit;  
Consisting of:  
CPU 1212C AC/DC/relay, HMI KTP400 Basic, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer
- SIMATIC S7-1200 + KTP700 Basic Starter Kit;  
Consisting of:  
CPU 1212C AC/DC/relay, HMI KTP700 Basic, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer
- SIMATIC S7-1200 Fail-Safe Starter Kit
  - With CPU 1212 FC DC/DC/relay;  
also includes:  
F-digital input SM 1226 16 x 24 V DC,  
F-digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Basic and STEP 7 Safety Basic V16, SIMATIC OPC UA S7-1200 Basic, info material; in Systainer
  - With CPU 1214 FC DC/DC/relay;  
also includes:  
F-digital input SM 1226 16 x 24 V DC,  
F-digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Safety Basic, SIMATIC OPC UA S7-1200 Basic, info material; in Systainer

### Ordering data

### Article No.

#### **Starter Kit CPU 1212C AC/DC/relay**

Complete offer SIMATIC S7-1200, starter box, consisting of: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, info material, in Systainer

**6ES7212-1BE34-4YB0**

#### **SIMATIC S7-1200 + KP300 Basic Starter Kit**

Consisting of:  
CPU 1212C AC/DC/relay, HMI KP300 Basic mono PN, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer

**6AV6651-7HA02-3AA4**

#### **SIMATIC S7-1200 + KTP400 Basic Starter Kit**

Consisting of:  
CPU 1212C AC/DC/relay, HMI KTP400 Basic, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer

**6AV6651-7KA02-3AA4**

#### **SIMATIC S7-1200 + KTP700 Basic Starter Kit**

Consisting of:  
CPU 1212C AC/DC/relay, HMI KTP700 Basic, input simulator, STEP 7 Basic, manual CD, SIMATIC OPC UA S7-1200 Basic Runtime license, Systainer

**6AV6651-7DA02-3AA4**

#### **SIMATIC S7-1200 Fail-Safe Starter Kit**

With CPU 1212 FC DC/DC/relay;  
also includes:  
F-digital input SM 1226 16 x 24 V DC,  
F-digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Basic and STEP 7 Safety Basic V16, SIMATIC OPC UA S7-1200 Basic, info material; in Systainer

**6ES7212-1HF41-4YB1**

With CPU 1214 FC DC/DC/relay;  
also includes:  
F-digital input SM 1226 16 x 24 V DC,  
F-digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Safety Basic, SIMATIC OPC UA S7-1200 Basic, info material; in Systainer

**6ES7212-1HF42-4YB1**

## SIMATIC S7-1200 Basic Controllers

Add-on products from third-party manufacturers

### SIMATIC S7-1200 CM CANopen

#### Overview



#### Note

The CM CANopen module is an HMS Industrial Networks product and can only be obtained through HMS.

The following description contains information on supplementary products that are manufactured and marketed, not by Siemens, but by third-parties outside the Siemens group ("external companies"). These external companies organize the manufacture, sale and delivery of their products independently. Their own terms and conditions of business and delivery apply.

Responsibility for these supplementary products and for the associated information presented here rests exclusively with the respective external company. Unless compulsory by law, Siemens assumes no liability and makes no guarantee for supplemental products of external companies. Please refer also to the note on "Exemption from liability/Use of hyperlinks" (see "More information").

#### Overview

An interface module is available for operating the SIMATIC S7-1200 on CANopen. It can be used together with system and IO components of the S7-1200 automation system.

CiA and CANopen are registered Community Trademarks of CAN in Automation e.V.

#### Application

CANopen is a widely used industrial bus system and can be used for a variety of different applications. The module allows simple and cost-effective connection of CANopen applications to SIMATIC.

- Control of hydraulic valves/axes in vehicles
- Control of motors in packaging machines or conveyors
- Capturing of angular encoder positions in wind turbines
- Capturing of control devices on machines, e.g. joysticks
- Capturing the measured data of path encoders, inclinometers or angular encoders, e.g. for tower cranes and gantry cranes

The CM CANopen module has the following properties:

- Interface module for CANopen (master/slave) for SIMATIC S7-1200
- Connection of up to 16 CANopen slave stations in the master mode
- 256 bytes of input data and 256 bytes of output data per module
- Connection of up to 3 modules per CPU
- 3 LEDs for module, network and I/O status diagnostics
- Possible integration of the module into the hardware catalog of the TIA Portal configuration suite
- Supports Transparent CAN 2.0A for processing customer-specific protocols
- CANopen implementation according to communication profiles CiA 301 Rev. 4.2 and CiA 302 Rev. 4.1 (master)

#### More information

The CANopen bus can be configured via any commercially available CANopen configuration tool. HMS Industrial Networks also supplies suitable "CM CANopen Configuration Studio" software with the product. The configuration is saved directly on the module by means of a USB connection. Routing via PROFIBUS/PROFINET is not possible.

Preprogrammed function blocks are available for easier PLC programming in the TIA Portal.

For further information, please contact HMS Industrial Networks directly:

<http://www.ixxat.com/cm-canopen>

#### Ordering and Support

Please note that ordering and support for the module are exclusively carried out via HMS Industrial Networks. Please contact HMS Industrial Networks directly should you have any questions concerning this module. The relevant contact details can be found on the Internet at

<http://www.ixxat.com/cm-canopen>

#### Exemption from liability/Use of hyperlinks

Siemens has prepared this description with great care. It is not possible, however, for Siemens to verify that the data supplied by external companies is complete, correct or up to date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the product for the user per se.

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## SIMATIC S7-1500 Advanced Controllers



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# SIMATIC S7-1500 Advanced Controllers

## Introduction

### S7-1500

#### Overview



With its extended ambient conditions, the SIMATIC S7-1500 can be used almost anywhere. Many PLCs can be operated in a temperature range from  $-25^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  and at altitudes up to 5,000 m as standard. A wide range of SIPLUS PLCs is available for requirements beyond this.

The SIMATIC S7-1500 is

- a modular, scalable, and universally usable system in IP20 degree of protection
- the system solution for a variety of automation applications in discrete automation
- maximum performance combined with excellent usability
- configurable in the Totally Integrated Automation Portal with STEP 7 Professional V12 or higher

#### Performance

- Increase in performance through
  - Faster command execution
  - Language extensions
  - New data types
  - Faster backplane bus
  - Optimized code generation
- Powerful communication:
  - PROFINET IO (2-port switch) as standard interface; from CPU 1515-2 PN, one or more additional integrated PROFINET interfaces, e.g. for network separation, for connecting further PROFINET devices or for high-speed communication as an I-Device
  - OPC UA server (data access) and client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems
  - Expandable with communications modules for bus systems and point-to-point connection

#### Integrated technology

- Motion Control integrated without additional modules:
  - Standardized blocks (PLCopen) for connection of analog and PROFIdrive-capable drives
  - The Motion Control functionality supports speed-controlled axes, positioning axes, relative synchronous operation (synchronizing without specification of the synchronized position), as well as external encoders, output cams and probes.
  - Extended Motion Control functions such as absolute synchronous operation (synchronizing with specification of the synchronized position), camming and functions for controlling kinematics are also integrated in the technology CPUs.
- Comprehensive trace functions for all CPU tags for real-time diagnostics and sporadic error detection; for effective commissioning and quick optimization of drives and controls
- Comprehensive control functionalities: e.g. easily configurable blocks for automatic optimization of the control parameters for optimum control quality
- Additional functions through available technology modules: e.g. high-speed counting, position detection, or measurement functions for signals up to 1 MHz

#### Safety Integrated

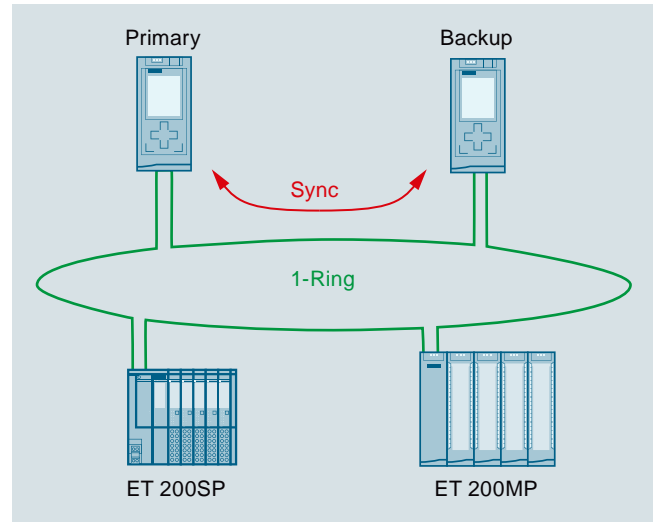
- Protection of personnel and machinery – within the framework of an integrated complete system
- Fail-safe SIMATIC S7-1500(T)F Controllers for processing standard and safety programs on the same controller. The fail-safe and standard user programs are created in the TIA Portal with the same editors; fail-safe data, for example, can therefore be evaluated like standard data in the standard user program. Due to this integration the system benefits and the comprehensive functionality of SIMATIC are also available for fail-safe applications.

## Overview

## Redundant systems



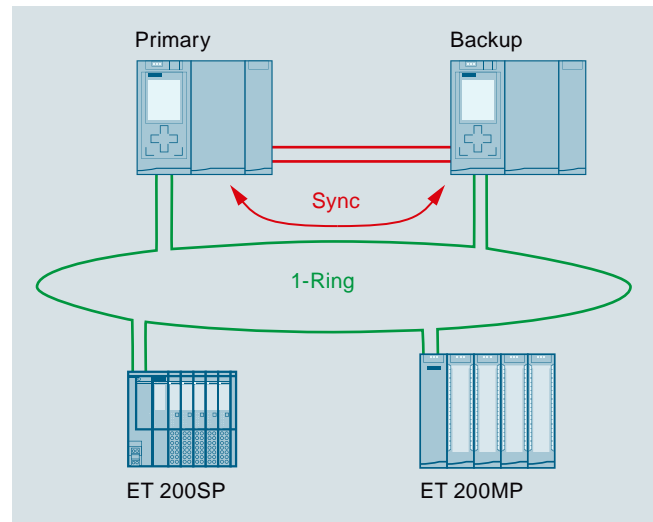
CPU 1513R-1 PN, CPU 1515R-2 PN



SIMATIC S7-1500R mode of operation



CPU 1517H-3 PN/FO



SIMATIC S7-1500H mode of operation

- Redundant S7-1500R/H CPUs for applications where availability of the PLC is crucial.
- Both CPUs are connected with the I/O stations via a PROFINET IO ring. Synchronization for the S7-1500R is via this ring, or via separate FOC synchronization cables for the S7-1500H. In the event of a CPU failure, the back-up CPU automatically assumes control of the process. No data is lost and the process can be continued extremely quickly. The PROFINET IO ring ensures that all nodes remain accessible in the event of a fieldbus interruption.
- The engineering corresponds to that of a standard CPU. The TIA Portal and redundant CPUs handle the synchronization of the programs and data. All without any additional overhead for the user.

# SIMATIC S7-1500 Advanced Controllers

## Introduction

### S7-1500

#### Overview

##### Security Integrated

- Password-based know-how protection against unauthorized read-out and modification of program blocks
- Copy protection for greater protection against unauthorized copying of program blocks:  
With copy protection, individual blocks on the SIMATIC Memory Card can be tied to its serial number so that the block can only be run if the configured memory card is inserted into the CPU.
- Rights concept with four different authorization levels: Different access rights can be assigned to various user groups. The new protection level 4 makes it possible to also restrict communication to HMI devices.
- Improved manipulation protection:  
Changed or unauthorized transfers of engineering data are detected by the controller.
- For use of an Ethernet CP (CP 1543-1):
  - Additional access protection by means of a firewall
  - Establishment of secure VPN connections

##### Design and handling

- CPUs with display for plain text information (display simulator tool on the Internet):
  - Information about article numbers, firmware version, and the serial number of all connected modules can be displayed
  - Setting the IP address of the CPU and additional network settings possible directly on site, without programming device on the display
  - Display of occurring error messages directly as plain text message, meaning reduction in downtime
- Uniform front connectors for all modules and integrated potential bridges for flexible potential group formation simplify stock keeping and reduce wiring effort
- Integrated DIN rail in the S7-1500 mounting rail: quick and easy installation of additional components such as miniature circuit breakers, relays, etc.
- Central expansion with signal modules: for flexible adaptation to any application
- System cabling for digital signal modules: for fast and clearly arranged connecting to sensors and actuators in the field and simple wiring inside the control cabinet
- Power supply:
  - Load power supply modules (PMs) for supplying the module with 24 V
  - Power supply modules to supply power to the internal module electronics via the backplane bus
  - System power supply modules for retentively storing the entire work memory on the controller
- Distributed expansion:
  - Use of up to 30 signal modules, communication modules, and technology modules via the PROFINET interface module IM 155-5 for the ET 200MP I/O system
  - No difference in terms of handling and system functions in central and distributed operation

##### Integrated system diagnostics

- Integrated system diagnostics for CPUs, activated by default:
  - Consistent plain text display of system diagnostic information in the display, TIA Portal, HMI, and web server, even for drive messages. Messages are updated even if the CPU is in STOP state.
  - System diagnostics integrated in the CPU firmware. Configuration by user not required. The diagnostics is automatically updated on configuration changes.

##### Support of SIMATIC ProDiag S7-1500

- ProDiag is a concept for the easy creation of machine and plant diagnostics It increases availability and supports with fault analysis and elimination on-site.

##### Datalog (archives) and recipes

- SIMATIC Memory Card:
  - Plug-in load memory
  - Permits firmware updates
  - Storage option for STEP 7 projects (including comments and symbols), additional documentation, or csv/ASCII files (for recipes and archives)
  - Easy access to plant-relevant operating data and configuration data with Office tools via the SD card reader (two-way data exchange from and to the PLC)
- Integrated web server:
  - Easy access to plant-relevant operating data and configuration data, Motion Control diagnostics and display of trace recordings via a web browser

##### Approvals

The SIMATIC S7-1500 complies with the following national and international standards:

- cULus approval
- cULus HazLoc approval
- FM approval
- ATEX approval (only for 24 V; not for 230 V)
- CE
- RCM (formerly C-Tick)
- KCC
- IECEx (24 V only; not for 230 V)
- EN 61000-6-4
- EN 60068-2-1/-2/-6/-14/-27/-30/-32
- EN 61131-2

You can find the marine approvals available for the S7-1500 on the Internet (SIMATIC Customer Support):

<http://www.siemens.com/automation/support>

The S7-1500 system is also suitable for operating at elevations up to 5000 m. You can find a list of all currently approved modules here:

<https://support.industry.siemens.com/cs/ww/en/view/109763260>

## Technical specifications

## General technical specifications SIMATIC S7-1500

Degree of protection	IP20 acc. to IEC 60 529
Ambient temperature	
• Horizontal installation	0...60 °C (display: at an operating temperature of typ. 50 °C, the display is switched off.)
• Vertical installation	0... 40 °C (display: at an operating temperature of typ. 40 °C, the display is switched off.)
Relative humidity	10 %...95 %, no condensation
Atmospheric pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)
Insulation	
• < 50 V	707 V DC test voltage (type test)
• < 150 V	2200 V DC test voltage
• < 250 V	2500 V DC test voltage
Electromagnetic compatibility	Requirements of the EMC directive; interference immunity according to IEC 61000-6-2
• Pulse-shaped disturbance variables	Test according to: Electrostatic discharge according to IEC 61000-4-2, burst pulses according to IEC 61000-4-4, energy single pulse (surge) according to IEC 61000-4-5,
• Sinusoidal disturbance variables	Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6
• Emission of radio frequency interference	Requirements of the EMC directive; interference emission according to EN 61000-6-4 Interference emission according to 61000-6-4 Interference emission of electromagnetic fields according to EN 61000-6-4
Mechanical stress	
• Vibrations	Testing according to EN 60068-2-6 Tested with: 5 Hz ≤ f ≤ 8.4 Hz, constant amplitude 7 mm; 9 Hz ≤ f ≤ 150 Hz, constant acceleration 2 g; duration of vibration: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes
• Shock	Testing according to EN 60068-2-27 Tested with: Half-wave: strength of shock 15 g peak value, 11 ms duration; shock direction: 3 shocks each in ± direction in each of the 3 mutually vertical axes

## General technical specifications SIPLUS S7-1500

Ambient temperature range	-40/-25/-20 ... +55/60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Extended range of environmental conditions	
• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0° C
Relative humidity	
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

## SIMATIC S7-1500 Advanced Controllers

Central processing units

### Standard CPUs

#### Overview CPU 1511-1 PN



- Entry-level CPU in the S7-1500 Controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call, Support
  - OPC UA Companion Specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

#### Overview CPU 1513-1 PN



- The CPU for applications with medium requirements for program/data storage in the S7-1500 Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU



### Overview CPU 1515-2 PN



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, precise position gearing between axes, support for external encoders, output cams/cam tracks and measuring inputs
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1516-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- UA server and client as runtime option for easy connection of the SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and measuring inputs
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

## SIMATIC S7-1500 Advanced Controllers

### Central processing units

#### Standard CPUs

##### Overview CPU 1517-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

##### Overview CPU 1518-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP address; for network separation. The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1518-4 PN/DP MFP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU Runtime, there is an additional C/C++ runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:  
The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

#### Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to maintenance and ruggedness.

This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required. Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++. This simplifies the creation or reuse of customer-specific, high-level language applications. The CPU 1518-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518-4 PN/DP with regard to the control unit. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program. By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized. Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

#### Note:

SIMATIC Memory Card required for operation of the CPU.

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Standard CPUs

Ordering data	Article No.	Ordering data	Article No.
<b>CPU 1511-1 PN</b> 150 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	6ES7511-1AK02-0AB0	<b>PE connection element for 2 000 mm DIN rail</b> 20 units	6ES7590-5AA00-0AA0
<b>CPU 1513-1 PN</b> 300 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	6ES7513-1AL02-0AB0	<b>System power supply</b> For supplying the backplane bus of the S7-1500 Controller	
<b>CPU 1515-2 PN</b> 500 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface; SIMATIC Memory Card required	6ES7515-2AM02-0AB0	24 V DC input voltage, power 25 W	6ES7505-0KA00-0AB0
<b>CPU 1516-3 PN/DP</b> 1 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7516-3AN02-0AB0	24/48/60 V DC input voltage, power 60 W	6ES7505-0RA00-0AB0
<b>CPU 1517-3 PN/DP</b> 2 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7517-3AP00-0AB0	24/48/60 V DC input voltage, power 60 W, buffering functionality	6ES7505-0RB00-0AB0
<b>CPU 1518-4 PN/DP</b> 4 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7518-4AP00-0AB0	120/230 V AC input voltage, power 60 W	6ES7507-0RA00-0AB0
<b>CPU 1518-4 PN/DP MFP</b> CPU 1518-4 PN/DP MFP, including C/C++ Runtime and OPC UA runtime license	6ES7518-4AX00-1AC0	<b>Power plug</b> With coding element for power supply module; spare part, 10 units	6ES7590-8AA00-0AA0
<b>Accessories</b>		<b>Load current supply</b> 24 V DC/3 A	6EP1332-4BA00
<b>SIMATIC Memory Card</b>		24 V DC/8 A	6EP1333-4BA00
4 MB	6ES7954-8LC03-0AA0	<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage • With push-in terminals	6ES7193-4JB00-0AA0
12 MB	6ES7954-8LE03-0AA0	<b>PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet</b>	
24 MB	6ES7954-8LF03-0AA0	With insulation displacement, max. transmission rate 12 Mbps	
256 MB	6ES7954-8LL03-0AA0	Without programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BA70-0XA0
2 GB, also for CPU 1518-4 PN/DP MFP	6ES7954-8LP03-0AA0	With programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BB70-0XA0
32 GB, also for CPU 1518-4 PN/DP MFP	6ES7954-8LT03-0AA0	<b>PROFIBUS FC standard cable GP</b>	6XV1830-0EH10
<b>SIMATIC S7-1500 DIN rail</b>		Standard type with special design for quick mounting, 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
Fixed lengths, with grounding elements		<b>PROFIBUS FC robust cable</b>	6XV1830-0JH10
• 160 mm	6ES7590-1AB60-0AA0	2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
• 245 mm	6ES7590-1AC40-0AA0	<b>PROFIBUS FC flexible cable</b>	6XV1831-2K
• 482 mm	6ES7590-1AE80-0AA0	2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
• 530 mm	6ES7590-1AF30-0AA0	<b>PROFIBUS FC trailing cable</b>	
• 830 mm	6ES7590-1AJ30-0AA0	2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
For cutting to length by customer, without drill holes; grounding elements must be ordered separately		Sheath color: Petrol	6XV1830-3EH10
• 2 000 mm	6ES7590-1BC00-0AA0	Sheath color: Violet	6XV1831-2L
		<b>PROFIBUS FC food cable</b>	6XV1830-0GH10
		2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	

Ordering data	Article No.	Ordering data	Article No.
<b>PROFIBUS FC ground cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-3FH10	<b>Display module 70 mm</b> For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	6ES7591-1BB00-0AA0
<b>PROFIBUS FC FRNC cable GP</b> 2-wire, shielded, flame-retardant, with copolymer protective jacket FRNC; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0LH10	<b>Display</b> For CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP MFP and CPU 1518F-4 PN/DP MFP; spare part	6ES7591-1BA02-0AA0
<b>PROFIBUS FastConnect stripping tool</b> Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00	<b>Cover 35 mm</b> For CPU1511-1PN, CPU1513-1 PN, CPU1511F-1 PN, CPU1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	6ES7591-4AB00-0AA0
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		<b>Cover 70 mm</b> For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	6ES7591-4BB00-0AA0
<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	<b>Front cover for PROFIBUS DP interface</b> For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	6ES7591-8AA00-0AA0
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-2AH10	<b>SIMATIC S7-1500 Starter Kit</b> Comprising: CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation	6ES7511-1CK03-4YB5
<b>IE FC TP trailing cable 2 x 2 (type C)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-3AH10	<b>STEP 7 Professional V17</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 1909, 2004, 20H2 • Windows 10 Enterprise Version 1909, 2004, 20H2 • Windows 10 IoT Enterprise 2016 LTSB • Windows 10 IoT Enterprise 2019 LTSC Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download	6ES7822-1AA07-0YA5  6ES7822-1AE07-0YA5
<b>IE FC TP marine cable 2 x 2 (type B)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-4AH10	STEP 7 Professional V17, floating license  STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>  Email address required for delivery	
<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00		
<b>Display module 35 mm</b> For CPU1511-1PN, CPU1513-1 PN, CPU1511F-1 PN, CPU1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	6ES7591-1AB00-0AA0		

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

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#### Ordering data

##### SIMATIC ODK 1500S

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) <sup>1)</sup>

Email address required for delivery

Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as of V1.0; software download including license key (floating license) <sup>1)</sup>

Email address required for delivery

#### Article No.

6ES7806-2CD03-0YA0

6ES7806-2CD03-0YG0

6ES7806-2CD03-0YK0

#### Article No.

##### SIMATIC Target for Simulink V5.0

Download incl. license key <sup>1)</sup>

Email address required for delivery

Upgrade of SIMATIC Target 1500S for Simulink V2.0...V4.0 to V5.0, download incl. license key <sup>1)</sup>

Email address required for delivery

##### SIMATIC Target + ODK 1500S bundle

Download incl. license key <sup>1)</sup>

Email address required for delivery

##### SIMATIC Manual Collection

Electronic manuals on DVD, multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC Distributed I/O,  
SIMATIC HMI,  
SIMATIC sensors, SIMATIC NET,  
SIMATIC PC-based Automation,  
SIMATIC PCS 7, SIMATIC PG/PC,  
SIMATIC S7, SIMATIC software,  
SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

Current Manual Collection DVD and the three subsequent updates

6ES7823-1BE04-0YA5

6ES7823-1BE04-0YE5

6ES7823-1BE14-0YA0

6ES7998-8XC01-8YE0

6ES7998-8XC01-8YE2

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

#### Technical specifications

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1PN, 150KB Program, 1MB Data	CPU 1513-1 PN, 300KB Prog., 1,5MB Data	CPU 1515-2 PN, 500KB Prog., 3MB Data	CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
<b>General information</b>				
Product type designation	CPU 1511-1 PN	CPU 1513-1 PN	CPU 1515-2 PN	CPU 1516-3 PN/DP
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1AK01-0AB0	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1AL01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7515-2AM01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3AN01-0AB0
<b>Display</b>				
Screen diagonal [cm]	3.45 cm	3.45 cm	6.1 cm	6.1 cm
<b>Supply voltage</b>				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
<b>Memory</b>				
<b>Work memory</b>				
• integrated (for program)	150 kbyte	300 kbyte	500 kbyte	1 Mbyte
• integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte	5 Mbyte
<b>Load memory</b>				
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
<b>CPU processing times</b>				
for bit operations, typ.	60 ns	40 ns	30 ns	10 ns
for word operations, typ.	72 ns	48 ns	36 ns	12 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns	16 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns	64 ns

### Technical specifications

Article number	<b>6ES7511-1AK02-0AB0</b> CPU 1511-1PN, 150KB Program, 1MB Data	<b>6ES7513-1AL02-0AB0</b> CPU 1513-1 PN, 300KB Prog., 1,5MB Data	<b>6ES7515-2AM02-0AB0</b> CPU 1515-2 PN, 500KB Prog., 3MB Data	<b>6ES7516-3AN02-0AB0</b> CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	2 048	2 048	2 048	2 048
<b>IEC counter</b>				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>				
• Number	2 048	2 048	2 048	2 048
<b>IEC timer</b>				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>				
<b>Flag</b>				
• Size, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>				
<b>Clock</b>				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
<b>1. Interface</b>				
<b>Interface types</b>				
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
<b>Protocols</b>				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes	Yes

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Article number	<b>6ES7511-1AK02-0AB0</b> CPU 1511-1PN, 150KB Program, 1MB Data	<b>6ES7513-1AL02-0AB0</b> CPU 1513-1 PN, 300KB Prog., 1,5MB Data	<b>6ES7515-2AM02-0AB0</b> CPU 1515-2 PN, 500KB Prog., 3MB Data	<b>6ES7516-3AN02-0AB0</b> CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
<b>PROFINET IO Controller</b>				
<b>Services</b>				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes	Yes
- PROFinergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	128	256	256
- of which in line, max.	128	128	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>				
<b>Services</b>				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- IRT	Yes	Yes	Yes	Yes
- PROFinergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
<b>2. Interface</b>				
<b>Interface types</b>				
• RJ 45 (Ethernet)			Yes; X2	Yes; X2
• Number of ports			1	1
• integrated switch			No	No
<b>Protocols</b>				
• IP protocol			Yes; IPv4	Yes; IPv4
• PROFINET IO Controller			Yes	Yes
• PROFINET IO Device			Yes	Yes
• SIMATIC communication			Yes	Yes
• Open IE communication			Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server			Yes	Yes
• Media redundancy			No	No



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#### Technical specifications

Article number	<b>6ES7511-1AK02-0AB0</b> CPU 1511-1PN, 150KB Program, 1MB Data	<b>6ES7513-1AL02-0AB0</b> CPU 1513-1 PN, 300KB Prog., 1,5MB Data	<b>6ES7515-2AM02-0AB0</b> CPU 1515-2 PN, 500KB Prog., 3MB Data	<b>6ES7516-3AN02-0AB0</b> CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
<b>PROFINET IO Controller</b>				
<b>Services</b>				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- Direct data exchange			No	No
- IRT			No	No
- PROFlenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Number of connectable IO Devices, max.			32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.			32	32
- of which in line, max.			32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.			8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.			8	8
- Updating times			The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>				
<b>Services</b>				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- IRT			No	No
- PROFlenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Shared device			Yes	Yes
- Number of IO Controllers with shared device, max.			4	4
- activation/deactivation of I-devices			Yes; per user program	Yes; per user program
- Asset management record			Yes; per user program	Yes; per user program
<b>3. Interface</b>				
<b>Interface types</b>				
• RS 485				Yes; X3
• Number of ports				1
<b>Protocols</b>				
• PROFIBUS DP master				Yes
• PROFIBUS DP slave				No
• SIMATIC communication				Yes
<b>PROFIBUS DP master</b>				
• Number of DP slaves, max.				125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

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Article number	<b>6ES7511-1AK02-0AB0</b> CPU 1511-1PN, 150KB Program, 1MB Data	<b>6ES7513-1AL02-0AB0</b> CPU 1513-1 PN, 300KB Prog., 1,5MB Data	<b>6ES7515-2AM02-0AB0</b> CPU 1515-2 PN, 500KB Prog., 3MB Data	<b>6ES7516-3AN02-0AB0</b> CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
<b>Protocols</b>				
<b>Number of connections</b>				
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>				
<b>Media redundancy</b>				
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50
<b>SIMATIC communication</b>				
• S7 routing	Yes	Yes	Yes	Yes
<b>OPC UA</b>				
• OPC UA Client	Yes	Yes	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes	Yes	Yes
<b>Supported technology objects</b>				
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	800	2 400	2 400
• Required Motion Control resources				
- per speed-controlled axis	40	40	40	40
- per positioning axis	80	80	80	80
- per synchronous axis	160	160	160	160
- per external encoder	80	80	80	80
- per output cam	20	20	20	20
- per cam track	160	160	160	160
- per probe	40	40	40	40
<b>Controller</b>				
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
<b>Counting and measuring</b>				
• High-speed counter	Yes	Yes	Yes	Yes

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#### Technical specifications

Article number	<b>6ES7511-1AK02-0AB0</b> CPU 1511-1PN, 150KB Program, 1MB Data	<b>6ES7513-1AL02-0AB0</b> CPU 1513-1 PN, 300KB Prog., 1,5MB Data	<b>6ES7515-2AM02-0AB0</b> CPU 1515-2 PN, 500KB Prog., 3MB Data	<b>6ES7516-3AN02-0AB0</b> CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>				
<b>Programming</b>				
<b>Programming language</b>				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
<b>Know-how protection</b>				
• User program protection/password protection	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes
<b>Access protection</b>				
• protection of confidential configuration data	Yes	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Width	35 mm	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>				
Weight, approx.	405 g	405 g	830 g	845 g
Article number	<b>6ES7517-3AP00-0AB0</b> CPU 1517-3 PN/DP, 2MB Prog./8MB Data	<b>6ES7518-4AP00-0AB0</b> CPU 1518-4 PN/DP, 4 MB Prog., 20MB Data	<b>6ES7518-4AX00-1AC0</b> CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA	
<b>General information</b>				
Product type designation	CPU 1517-3 PN/DP	CPU 1518-4 PN/DP	CPU 1518-4 PN/DP MFP	
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	V17 (FW V2.9) / V13 Update 3 (FW V1.6) or higher	V17 (FW V2.9) / V13 (FW V1.5) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher	
<b>Display</b>				
Screen diagonal [cm]	6.1 cm	6.1 cm	6.1 cm	
<b>Supply voltage</b>				
Type of supply voltage	24 V DC	24 V DC	24 V DC	

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Standard CPUs

#### Technical specifications

Article number	<b>6ES7517-3AP00-0AB0</b> CPU 1517-3 PN/DP, 2MB Prog./8MB Data	<b>6ES7518-4AP00-0AB0</b> CPU 1518-4 PN/DP, 4 MB Prog., 20MB Data	<b>6ES7518-4AX00-1AC0</b> CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
<b>Memory</b>			
<b>Work memory</b>			
• integrated (for program)	2 Mbyte	6 Mbyte	6 Mbyte
• integrated (for data)	8 Mbyte	60 Mbyte	60 Mbyte
• integrated (for CPU function library of CPU Runtime)			50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
<b>Working memory for additional functions</b>			
• Integrated (for C/C++ Runtime application)			1 024 Mbyte
<b>Load memory</b>			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte; The memory card must have at least 2 GB of space on it
<b>CPU processing times</b>			
for bit operations, typ.	2 ns	1 ns	1 ns
for word operations, typ.	3 ns	2 ns	2 ns
for fixed point arithmetic, typ.	3 ns	2 ns	2 ns
for floating point arithmetic, typ.	12 ns	6 ns	6 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>			
<b>Clock</b>			
• Type	Hardware clock	Hardware clock	Hardware clock
<b>1. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
<b>Protocols</b>			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes

### Technical specifications

Article number	<b>6ES7517-3AP00-0AB0</b>	<b>6ES7518-4AP00-0AB0</b>	<b>6ES7518-4AX00-1AC0</b>
	CPU 1517-3 PN/DP, 2MB Prog./8MB Data	CPU 1518-4 PN/DP, 4 MB Prog., 20MB Data	CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
<b>PROFINET IO Controller</b>			
<b>Services</b>			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes
- PROFinergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max.	512	512	512
- of which in line, max.	512	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>			
<b>Services</b>			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	Yes	Yes; Minimum send cycle of 250 µs	Yes; Minimum send cycle of 250 µs
- PROFinergy	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program
<b>2. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)	Yes; X2	Yes; X2	Yes; X2
• Number of ports	1	1	1
• integrated switch	No	No	No
<b>Protocols</b>			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Standard CPUs

#### Technical specifications

Article number	<b>6ES7517-3AP00-0AB0</b>	<b>6ES7518-4AP00-0AB0</b>	<b>6ES7518-4AX00-1AC0</b>
	CPU 1517-3 PN/DP, 2MB Prog./8MB Data	CPU 1518-4 PN/DP, 4 MB Prog., 20MB Data	CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
<b>PROFINET IO Controller</b>			
<b>Services</b>			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Direct data exchange	No	No	No
- IRT	No	No	No
- PROFlenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	No	No	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128	128	128
- of which in line, max.	128	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>			
<b>Services</b>			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFlenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	No	No	No
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program
<b>3. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)		Yes; X3	Yes; X3
• RS 485	Yes; X3		
• Number of ports	1	1	1; C/C++ Runtime can also be reached via this port
• integrated switch		No	No
<b>Protocols</b>			
• IP protocol		Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		No	No
• PROFINET IO Device		No	No
• PROFIBUS DP master	Yes		
• PROFIBUS DP slave	No		
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication		Yes	Yes
• Web server		Yes	Yes
<b>PROFIBUS DP master</b>			
• Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET		

### Technical specifications

Article number	<b>6ES7517-3AP00-0AB0</b>	<b>6ES7518-4AP00-0AB0</b>	<b>6ES7518-4AX00-1AC0</b>
	CPU 1517-3 PN/DP, 2MB Prog./8MB Data	CPU 1518-4 PN/DP, 4 MB Prog., 20MB Data	CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
<b>4. Interface</b>			
<b>Interface types</b>			
<ul style="list-style-type: none"> <li>• RS 485</li> <li>• Number of ports</li> </ul>		Yes; X4 1	Yes; X4 1
<b>Protocols</b>			
<ul style="list-style-type: none"> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> <li>• SIMATIC communication</li> </ul>		Yes No Yes	Yes No Yes
<b>PROFIBUS DP master</b>			
<ul style="list-style-type: none"> <li>• Number of DP slaves, max.</li> </ul>		125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>			
<b>Number of connections</b>			
<ul style="list-style-type: none"> <li>• Number of connections, max.</li> </ul>	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>			
<b>Media redundancy</b>			
<ul style="list-style-type: none"> <li>- Media redundancy</li> <li>- MRP</li> <li>- MRP interconnection, supported</li> <li>- MRPD</li> <li>- Switchover time on line break, typ.</li> <li>- Number of stations in the ring, max.</li> </ul>	only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50	only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50	only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50
<b>SIMATIC communication</b>			
<ul style="list-style-type: none"> <li>• S7 routing</li> </ul>	Yes	Yes	Yes
<b>OPC UA</b>			
<ul style="list-style-type: none"> <li>• OPC UA Client</li> <li>• OPC UA Server</li> <li>• Alarms and Conditions</li> </ul>	Yes Yes; Data access (read, write, subscribe), method call, custom address space Yes	Yes Yes; Data access (read, write, subscribe), method call, custom address space Yes	Yes Yes; Data access (read, write, subscribe), method call, custom address space Yes
<b>Supported technology objects</b>			
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
<ul style="list-style-type: none"> <li>• Number of available Motion Control resources for technology objects</li> <li>• Required Motion Control resources</li> <li>- per speed-controlled axis</li> <li>- per positioning axis</li> <li>- per synchronous axis</li> <li>- per external encoder</li> <li>- per output cam</li> <li>- per cam track</li> <li>- per probe</li> </ul>	10 240 40 80 160 80 20 160 40	15 360 40 80 160 80 20 160 40	15 360 40 80 160 80 20 160 40
Controller			
<ul style="list-style-type: none"> <li>• PID_Compact</li> <li>• PID_3Step</li> <li>• PID-Temp</li> </ul>	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
Counting and measuring			
<ul style="list-style-type: none"> <li>• High-speed counter</li> </ul>	Yes	Yes	Yes

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Standard CPUs

#### Technical specifications

Article number	<b>6ES7517-3AP00-0AB0</b> CPU 1517-3 PN/DP, 2MB Prog./8MB Data	<b>6ES7518-4AP00-0AB0</b> CPU 1518-4 PN/DP, 4 MB Prog., 20MB Data	<b>6ES7518-4AX00-1AC0</b> CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
<b>Access protection</b>			
• protection of confidential configuration data	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
<b>Open Development interfaces</b>			
• Size of ODK SO file, max.			9.8 Mbyte
<b>Dimensions</b>			
Width	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
<b>Weights</b>			
Weight, approx.	1 978 g	1 988 g	2 117 g



### Overview SIPLUS CPU 1511-1 PN



- Entry-level CPU in the S7-1500 Controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call, Support
  - OPC UA Companion Specifications
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- SIMATIC Memory Card required for operation of the CPU

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information has been added.

### Overview SIPLUS CPU 1513-1 PN



- The CPU for applications with medium/high requirements for program/data storage in the S7-1500 Controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- OPC UA server and client as runtime option for the easy connection of SIPLUS S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call, Support
  - OPC UA Companion Specifications
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- SIMATIC Memory Card required for operation of the CPU

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## SIMATIC S7-1500 Advanced Controllers

Central processing units

### SIPLUS standard CPUs

#### Overview SIPLUS CPU 1516-3 PN/DP



- The CPU with large program and data memory in the S7-1500 Controller product range for applications with high program scope requirements.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- SIMATIC Memory Card required for operation of the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Overview SIPLUS CPU 1518-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

SIMATIC Memory Card required for operation of the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Overview SIPLUS CPU 1518-4 PN/DP MFP



- CPU with an extremely large program and data memory in the S7-1500 Controller product range for demanding applications with demanding requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:  
The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA server (Data Access) as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

#### Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518-4 PN/DP MFP allows the merging of previously separate applications on a common platform, and continues to meet the high demands of the S7-1500 in respect of ease of maintenance and ruggedness.

This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required. Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++.

This simplifies the creation or reuse of customer-specific, high-level language applications. The CPU 1518-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518-4 PN/DP with regard to the control unit. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program. By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized. Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

#### Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### SIPLUS standard CPUs

#### Ordering data

#### Article No.

#### Article No.

##### SIPLUS CPU 1511-1 PN

(extended temperature range and exposure to media)

150 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required

Temperature range -40 ... +60 °C

**6AG1511-1AK02-2AB0**

Temperature range -40 ... +70 °C

**6AG1511-1AK02-7AB0**

##### SIPLUS CPU 1513-1 PN

(extended temperature range and exposure to media)

300 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required

Temperature range -40 ... +60 °C

**6AG1513-1AL02-2AB0**

Temperature range -40 ... +70 °C

**6AG1513-1AL02-7AB0**

##### SIPLUS CPU 1516-3 PN/DP

(extended temperature range and exposure to media)

1 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required

Temperature range -40 ... +60 °C (startup -20 °C)

**6AG1516-3AN01-2AB0**

Temperature range -40 ... +70 °C

**6AG1516-3AN02-7AB0**

##### SIPLUS CPU 1518-4 PN/DP

**6AG1518-4AP00-4AB0**

(Exposure to media)

3 MB work memory for program, 10 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required

##### SIPLUS CPU 1518-4 PN/DP MFP

(Exposure to media)

4 MB work memory for program, 20 MB for data, 50 MB for CPU function library in the CPU runtime, 500 MB for C/C++ runtime application, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; C/C++ runtime and OPC UA runtime license included; SIMATIC Memory Card required

**6AG1518-4AX00-4AC0**

#### Accessories

##### System power supply

(extended temperature range and exposure to media)

24 V DC input voltage, power 25 W

**6AG1505-0KA00-7AB0**

24/48/60 V DC input voltage, power 60 W

**6AG1505-0RA00-7AB0**

120/230 V AC input voltage, power 60 W

**6AG1507-0RA00-7AB0**

##### Load current supply

(extended temperature range and exposure to media)

24 V DC/3 A

**6AG1332-4BA00-7AA0**

24 V DC/8 A

**6AG1333-4BA00-7AA0**

##### Display

(extended temperature range and exposure to media)

For SIPLUS CPU 1511-1 PN and CPU 1513-1 PN; spare part

**6AG1591-1AB00-2AA0**

For SIPLUS CPU 1516-3 PN/DP, 6AG1516-3AN01-2AB0; spare part

**6AG1591-1BA01-2AA0**

For SIPLUS CPU 1516-3 PN/DP, 6AG1516-3AN02-7AB0; spare part

**6AG1591-1BB00-2AA0**

For SIPLUS CPU 1518-4 PN/DP and SIPLUS CPU 1518-4 PN/DP; spare part

**6AG1591-1BA02-2AA0**

##### Other accessories

See SIMATIC S7-1500, standard CPUs, page 4/10

### Technical specifications

Article number	6AG1511-1AK02-2AB0	6AG1511-1AK02-7AB0	6AG1513-1AL02-2AB0	6AG1513-1AL02-7AB0
Based on	6ES7511-1AK02-0AB0	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7513-1AL02-0AB0
	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1513-1 PN	SIPLUS S7-1500 CPU 1513-1 PN
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### SIPLUS standard CPUs

#### Technical specifications

Article number	<b>6AG1511-1AK02-2AB0</b>	<b>6AG1511-1AK02-7AB0</b>	<b>6AG1513-1AL02-2AB0</b>	<b>6AG1513-1AL02-7AB0</b>
Based on	<b>6ES7511-1AK02-0AB0</b> SIPLUS S7-1500 CPU 1511-1 PN	<b>6ES7511-1AK02-0AB0</b> SIPLUS S7-1500 CPU 1511-1 PN	<b>6ES7513-1AL02-0AB0</b> SIPLUS S7-1500 CPU 1513-1 PN	<b>6ES7513-1AL02-0AB0</b> SIPLUS S7-1500 CPU 1513-1 PN
<b>Usage in industrial process technology</b>	<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3 (excluding trichlorethylene)</li> <li>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3 (excluding trichlorethylene)</li> <li>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3 (excluding trichlorethylene)</li> <li>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</li> </ul>
<b>Remark</b>	<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>
Article number	<b>6AG1516-3AN01-2AB0</b>	<b>6AG1516-3AN02-7AB0</b>	<b>6AG1518-4AP00-4AB0</b>	<b>6AG1518-4AX00-4AC0</b>
Based on	<b>6ES7516-3AN01-0AB0</b> SIPLUS S7-1500 CPU 1516-3 PN/DP	<b>6ES7516-3AN02-0AB0</b> SIPLUS S7-1500 CPU 1516-3 PN/DP	<b>6ES7518-4AP00-0AB0</b> SIPLUS S7-1500 CPU 1518-4 PN/DP	<b>6ES7518-4AX00-1AC0</b> SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C	-40 °C; = Tmin (incl. condensation/frost)	0 °C; = Tmin (incl. condensation/frost)	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-40 °C; = Tmin; Startup @ -20 °C	-40 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax bei 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) bei 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) bei 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)

### Technical specifications

Article number	6AG1516-3AN01-2AB0	6AG1516-3AN02-7AB0	6AG1518-4AP00-4AB0	6AG1518-4AX00-4AC0
Based on	6ES7516-3AN01-0AB0 SIPLUS S7-1500 CPU 1516-3 PN/DP	6ES7516-3AN02-0AB0 SIPLUS S7-1500 CPU 1516-3 PN/DP	6ES7518-4AP00-0AB0 SIPLUS S7-1500 CPU 1518-4 PN/DP	6ES7518-4AX00-1AC0 SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## SIMATIC S7-1500 Advanced Controllers

### Central processing units

#### Compact CPUs

##### Overview CPU 1511C-1 PN



- The compact CPU with integral digital and analog inputs and outputs in the product spectrum of the S7-1500 Controllers
- With integrated technological functions, e.g. high-speed counter (HSC), frequency measurement, period duration measurement or stepper motor control, pulse width modulation, frequency output
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Isochronous mode (distributed)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

##### Overview CPU 1512C-1 PN



- The compact CPU with integral digital and analog inputs and outputs in the product spectrum of the S7-1500 Controllers
- With integrated technological functions, e.g. high-speed counter (HSC), frequency measurement, period duration measurement or stepper motor control, pulse width modulation, frequency output
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Isochronous mode (distributed)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.



Ordering data	Article No.	Ordering data	Article No.
<b>CPU 1511C-1 PN</b> 175 KB work memory for program, 1 MB for data, 16 digital inputs, 16 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, PROFINET IRT interface with 2-port switch, SIMATIC Memory Card required	6ES7511-1CK01-0AB0	<b>System power supply</b> For supplying the backplane bus of the S7-1500 Controller 24 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W 24/48/60 V DC input voltage, power 60 W, buffering functionality 120/230 V AC input voltage, power 60 W	<b>6ES7505-0KA00-0AB0</b> <b>6ES7505-0RA00-0AB0</b> <b>6ES7505-0RB00-0AB0</b> <b>6ES7507-0RA00-0AB0</b>
<b>CPU 1512C-1 PN</b> 250 KB work memory for program, 1 MB for data, 32 digital inputs, 32 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, PROFINET IRT interface with 2-port switch, SIMATIC Memory Card required	6ES7512-1CK01-0AB0	<b>Power plug</b> With coding element for power supply module; spare part, 10 units	6ES7590-8AA00-0AA0
<b>Accessories</b> <b>SIMATIC Memory Card</b> 4 MB 12 MB 24 MB 256 MB 2 GB 32 GB	<b>6ES7954-8LC03-0AA0</b> <b>6ES7954-8LE03-0AA0</b> <b>6ES7954-8LF03-0AA0</b> <b>6ES7954-8LL03-0AA0</b> <b>6ES7954-8LP03-0AA0</b> <b>6ES7954-8LT03-0AA0</b>	<b>Load current supply</b> 24 V DC/3 A 24 V DC/8 A	<b>6EP1332-4BA00</b> <b>6EP1333-4BA00</b>
<b>Front connector</b> For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	6ES7592-1BM00-0XA0	<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage • With push-in terminals	6ES7193-4JB00-0AA0
<b>Shielding set I/O</b> For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).	6ES7590-5CA10-0XA0	<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
<b>Shield terminal element</b> 10 units; spare part	6ES7590-5BA00-0AA0	<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
<b>SIMATIC S7-1500 DIN rail</b> Fixed lengths, with grounding elements • 160 mm • 245 mm • 482 mm • 530 mm • 830 mm For cutting to length by customer, without drill holes; grounding elements must be ordered separately • 2 000 mm	<b>6ES7590-1AB60-0AA0</b> <b>6ES7590-1AC40-0AA0</b> <b>6ES7590-1AE80-0AA0</b> <b>6ES7590-1AF30-0AA0</b> <b>6ES7590-1AJ30-0AA0</b>  <b>6ES7590-1BC00-0AA0</b>	<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-2AH10
<b>PE connection element for 2 000 mm DIN rail</b> 20 units	6ES7590-5AA00-0AA0	<b>IE FC TP trailing cable 2 x 2 (type C)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-3AH10
		<b>IE FC TP marine cable 2 x 2 (type B)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-4AH10
		<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Compact CPUs

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Ordering data	Article No.	Article No.
<b>Display module 35 mm</b> For CPU 1511-1PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	<b>6ES7591-1AB00-0AA0</b>	
<b>Cover 35 mm</b> For CPU 1511-1PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	<b>6ES7591-4AB00-0AA0</b>	
<b>SIMATIC S7-1500 Starter Kit</b> Comprising: CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation	<b>6ES7511-1CK03-4YB5</b>	
		<b>STEP 7 Professional V17</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) <ul style="list-style-type: none"> <li>Windows 10 Professional Version 1909, 2004, 20H2</li> <li>Windows 10 Enterprise Version 1909, 2004, 20H2</li> <li>Windows 10 IoT Enterprise 2016 LTSC</li> <li>Windows 10 IoT Enterprise 2019 LTSC</li> </ul> Windows Server (64-bit) <ul style="list-style-type: none"> <li>Windows Server 2016 Standard (full installation)</li> <li>Windows Server 2019 Standard (full installation)</li> </ul> Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V17, floating license <b>6ES7822-1AA06-0YA5</b> STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup> <b>6ES7822-1AE06-0YA5</b> Email address required for delivery
		<b>SIMATIC Manual Collection</b> <b>6ES7998-8XC01-8YE0</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC
		<b>SIMATIC Manual Collection update service for 1 year</b> <b>6ES7998-8XC01-8YE2</b> Current Manual Collection DVD and the three subsequent updates

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	<b>6ES7511-1CK01-0AB0</b>	<b>6ES7512-1CK01-0AB0</b>
	CPU 1511C-1 PN, 175 KB Prog, 1 MB Data	CPU 1512C-1 PN, 250 KB Prog, 1 MB Data
<b>General information</b>		
Product type designation	CPU 1511C-1 PN	CPU 1512C-1 PN
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/integrated from version	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1CK00-0AB0	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7512-1CK00-0AB0
<b>Display</b>		
Screen diagonal [cm]	3.45 cm	3.45 cm
<b>Supply voltage</b>		
Type of supply voltage	24 V DC	24 V DC
<b>Memory</b>		
<b>Work memory</b>		
• integrated (for program)	175 kbyte	250 kbyte
• integrated (for data)	1 Mbyte	1 Mbyte
<b>Load memory</b>		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte

### Technical specifications

Article number	<b>6ES7511-1CK01-0AB0</b> CPU 1511C-1 PN, 175 KB Prog, 1 MB Data	<b>6ES7512-1CK01-0AB0</b> CPU 1512C-1 PN, 250 KB Prog, 1 MB Data
<b>CPU processing times</b>		
for bit operations, typ.	60 ns	48 ns
for word operations, typ.	72 ns	58 ns
for fixed point arithmetic, typ.	96 ns	77 ns
for floating point arithmetic, typ.	384 ns	307 ns
<b>Counters, timers and their retentivity</b>		
<b>S7 counter</b>		
• Number	2 048	2 048
<b>IEC counter</b>		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>		
• Number	2 048	2 048
<b>IEC timer</b>		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>		
<b>Flag</b>		
• Size, max.	16 kbyte	16 kbyte
<b>Address area</b>		
<b>I/O address area</b>		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>		
<b>Clock</b>		
• Type	Hardware clock	Hardware clock
<b>Digital inputs</b>		
integrated channels (DI)	16	32
<b>Digital outputs</b>		
integrated channels (DO)	16	32
Short-circuit protection	Yes; electronic/thermal	Yes; electronic/thermal
<b>Analog outputs</b>		
integrated channels (AO)	2	2
<b>1. Interface</b>		
<b>Interface types</b>		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
• Number of ports	2	2
• integrated switch	Yes	Yes
<b>Protocols</b>		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Compact CPUs

#### Technical specifications

Article number	<b>6ES7511-1CK01-0AB0</b> CPU 1511C-1 PN, 175 KB Prog, 1 MB Data	<b>6ES7512-1CK01-0AB0</b> CPU 1512C-1 PN, 250 KB Prog, 1 MB Data
<b>PROFINET IO Controller</b>		
<b>Services</b>		
- PG/OP communication	Yes	Yes
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- PROFlenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>		
<b>Services</b>		
- PG/OP communication	Yes	Yes
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFlenergy	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
<b>Protocols</b>		
<b>Number of connections</b>		
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>		
<b>Media redundancy</b>		
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
<b>SIMATIC communication</b>		
• S7 routing	Yes	Yes
<b>OPC UA</b>		
• OPC UA Client	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes

### Technical specifications

Article number	<b>6ES7511-1CK01-0AB0</b> CPU 1511C-1 PN, 175 KB Prog, 1 MB Data	<b>6ES7512-1CK01-0AB0</b> CPU 1512C-1 PN, 250 KB Prog, 1 MB Data
<b>Supported technology objects</b>		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-25 °C; No condensation	-25 °C; No condensation
• horizontal installation, max.	60 °C; note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-25 °C; No condensation	-25 °C; No condensation
• vertical installation, max.	40 °C; note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>		
<b>Programming</b>		
<b>Programming language</b>		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- GRAPH	Yes	Yes
<b>Know-how protection</b>		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
<b>Access protection</b>		
• protection of confidential configuration data	Yes	Yes
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
<b>Dimensions</b>		
Width	85 mm	110 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	1 050 g	1 360 g

## SIMATIC S7-1500 Advanced Controllers

### Central processing units

#### Fail-safe CPUs

##### Overview CPU 1511F-1 PN



- Entry-level CPU in the S7-1500F Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU

##### Overview CPU 1513F-1 PN



- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the S7-1500 Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1515F-2 PN



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1516F-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders.
- Integrated web server with the option of creating user-defined web pages.

Note:

SIMATIC Memory Card required for operation of the CPU

## SIMATIC S7-1500 Advanced Controllers

### Central processing units

#### Fail-safe CPUs

##### Overview CPU 1517F-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, positionally precise gearing between axes
- Integrated web server with the option of creating user-defined web pages

#### Note:

SIMATIC Memory Card required for operation of the CPU

##### Overview CPU 1518F-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with highest requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central PLC in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages.

#### Note:

SIMATIC Memory Card required for operation of the CPU.



### Overview CPU 1518F-4 PN/DP MFP



- CPU with an extremely large program and data memory in the S7-1500 Controller product range for demanding standard and fail-safe applications with demanding requirements regarding program scope, performance and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU Runtime, there is an additional C/C++ runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:  
The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA server (data access) as runtime option for easy connection of the SIMATIC S7-1500 to non-Siemens devices/systems
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

#### Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518F-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to maintenance and ruggedness.

This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Besides the option of running C/C++ code in the standard STEP 7 program, the multi-functional platform CPU 1518F-4 PN/DP MFP thus provides an additional second independent runtime environment which facilitates execution of C/C++ applications in parallel to the STEP 7 program if required. Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++. This simplifies the creation or reuse of customer-specific, high-level language applications. The CPU 1518F-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518F-4 PN/DP with regard to the control part. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program. By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized. Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

#### Note:

SIMATIC memory card required for operation of the CPU.

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Fail-safe CPUs

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Ordering data	Article No.	Article No.
<b>CPU 1511F-1 PN</b> Fail-safe CPU, 230 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	6ES7511-1FK02-0AB0	
<b>CPU 1513F-1 PN</b> Fail-safe CPU, 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	6ES7513-1FL02-0AB0	
<b>CPU 1515F-2 PN</b> Fail-safe CPU, 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch; PROFINET RT interface; SIMATIC Memory Card required	6ES7515-2FM02-0AB0	
<b>CPU 1516F-3 PN/DP</b> Fail-safe CPU, 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7516-3FN02-0AB0	
<b>CPU 1517F-3 PN/DP</b> Fail-safe CPU, 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7517-3FP00-0AB0	
<b>CPU 1518F-4 PN/DP</b> Fail-safe CPU, 6 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7518-4FP00-0AB0	
<b>CPU 1518F-4 PN/DP MFP</b> CPU 1518F-4 PN/DP MFP, including C/C++ Runtime and OPC UA runtime license	6ES7518-4FX00-1AC0	
		<b>Accessories</b> <b>SIMATIC Memory Card</b> 4 MB <b>6ES7954-8LC03-0AA0</b> 12 MB <b>6ES7954-8LE03-0AA0</b> 24 MB <b>6ES7954-8LF03-0AA0</b> 256 MB <b>6ES7954-8LL03-0AA0</b> 2 GB, also for CPU 1518F-4 PN/DP MFP <b>6ES7954-8LP03-0AA0</b> 32 GB, also for CPU 1518F-4 PN/DP MFP <b>6ES7954-8LT03-0AA0</b> <b>SIMATIC S7-1500 DIN rail</b> Fixed lengths, with grounding elements <ul style="list-style-type: none"> <li>• 160 mm <b>6ES7590-1AB60-0AA0</b></li> <li>• 245 mm <b>6ES7590-1AC40-0AA0</b></li> <li>• 482 mm <b>6ES7590-1AE80-0AA0</b></li> <li>• 530 mm <b>6ES7590-1AF30-0AA0</b></li> <li>• 830 mm <b>6ES7590-1AJ30-0AA0</b></li> </ul> For cutting to length by customer, without drill holes; grounding elements must be ordered separately <ul style="list-style-type: none"> <li>• 2 000 mm <b>6ES7590-1BC00-0AA0</b></li> </ul> <b>PE connection element for            2 000 mm DIN rail</b> <b>6ES7590-5AA00-0AA0</b> 20 units
		<b>System power supply</b> For supplying the backplane bus of the S7-1500 Controller 24 V DC input voltage, power 25 W <b>6ES7505-0KA00-0AB0</b> 24/48/60 V DC input voltage, power 60 W <b>6ES7505-0RA00-0AB0</b> 24/48/60 V DC input voltage, power 60 W, buffering functionality <b>6ES7505-0RB00-0AB0</b> 120/230 V AC input voltage, power 60 W <b>6ES7507-0RA00-0AB0</b>
		<b>Power plug</b> <b>6ES7590-8AA00-0AA0</b> With coding element for power supply module; spare part, 10 units
		<b>Load current supply</b> 24 V DC/3 A <b>6EP1332-4BA00</b> 24 V DC/8 A <b>6EP1333-4BA00</b>
		<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>• With push-in terminals <b>6ES7193-4JB00-0AA0</b></li> </ul>

Ordering data	Article No.	Article No.	
<b>PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet</b> With insulation displacement, max. transmission rate 12 Mbps Without programming device interface, grounding via control cabinet contact surface; 1 unit With programming device interface, grounding via control cabinet contact surface; 1 unit	<b>6ES7972-0BA70-0XA0</b>  <b>6ES7972-0BB70-0XA0</b>	<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>
<b>PROFIBUS FC standard cable GP</b> Standard type with special design for quick mounting, 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1830-0EH10</b>	<b>IE FC TP trailing cable 2 x 2 (type C)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>
<b>PROFIBUS FC robust cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1830-0JH10</b>	<b>IE FC TP marine cable 2 x 2 (type B)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>
<b>PROFIBUS FC flexible cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1831-2K</b>	<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
<b>PROFIBUS FC trailing cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m Sheath color: Petrol Sheath color: Violet	<b>6XV1830-3EH10</b>  <b>6XV1831-2L</b>	<b>Display module 35 mm</b> For CPU 1511-1PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	<b>6ES7591-1AB00-0AA0</b>
<b>PROFIBUS FC food cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1830-0GH10</b>	<b>Display module 70 mm</b> For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	<b>6ES7591-1BB00-0AA0</b>
<b>PROFIBUS FC ground cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1830-3FH10</b>	<b>Display</b> For CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP MFP and CPU 1518F-4 PN/DP MFP; spare part	<b>6ES7591-1BA02-0AA0</b>
<b>PROFIBUS FC FRNC cable GP</b> 2-wire, shielded, flame-retardant, with copolymer protective jacket FRNC; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1830-0LH10</b>	<b>Cover 35 mm</b> For CPU 1511-1PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	<b>6ES7591-4AB00-0AA0</b>
<b>PROFIBUS FastConnect stripping tool</b> Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	<b>6GK1905-6AA00</b>	<b>Cover 70 mm</b> For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	<b>6ES7591-4BB00-0AA0</b>
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		<b>Front cover for PROFIBUS DP interface</b> For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	<b>6ES7591-8AA00-0AA0</b>
<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b>  <b>6GK1901-1BB10-2AB0</b>  <b>6GK1901-1BB10-2AE0</b>		

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Fail-safe CPUs

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#### Ordering data

#### Article No.

##### SIMATIC S7-1500 Starter Kit

6ES7511-1CK03-4YB5

Comprising: CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation

##### STEP 7 Professional V17

**Target system:**  
SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

**Requirement:**

- Windows 10 (64-bit)
- Windows 10 Professional Version 1909, 2004, 20H2
  - Windows 10 Enterprise Version 1909, 2004, 20H2
  - Windows 10 IoT Enterprise 2016 LTSB
  - Windows 10 IoT Enterprise 2019 LTSC

Windows Server (64-bit)

- Windows Server 2016 Standard (full installation)
- Windows Server 2019 Standard (full installation)

**Type of delivery:**

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V17, floating license

6ES7822-1AA07-0YA5

STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>

6ES7822-1AE07-0YA5

Email address required for delivery

##### STEP 7 Safety Advanced V17

**Task:**

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

**Requirement:**

STEP 7 Professional V17

**Note:**

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA17-0YA5

Floating license for 1 user, license key for download<sup>1)</sup>; email address required for delivery

6ES7833-1FA17-0YH5

#### Article No.

##### SIMATIC ODK 1500S

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive

6ES7806-2CD03-0YA0

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) <sup>1)</sup>

6ES7806-2CD03-0YG0

Email address required for delivery

Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as of V1.0; software download including license key (floating license) <sup>1)</sup>

6ES7806-2CD03-0YK0

Email address required for delivery

##### SIMATIC Target for Simulink V5.0

Download incl. license key <sup>1)</sup>

6ES7823-1BE04-0YA5

Email address required for delivery

Upgrade of SIMATIC Target 1500S for Simulink V2.0...V4.0 to V5.0, download incl. license key <sup>1)</sup>

6ES7823-1BE04-0YE5

Email address required for delivery

##### SIMATIC Target + ODK 1500S bundle

6ES7823-1BE14-0YA0

Download incl. license key <sup>1)</sup>

Email address required for delivery

##### SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current Manual Collection DVD and the three subsequent updates

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

Fail-safe CPUs

### Technical specifications

Article number	<b>6ES7511-1FK02-0AB0</b> CPU 1511F-1PN, 225KB prog, 1MB data	<b>6ES7513-1FL02-0AB0</b> CPU 1513F-1 PN, 450KB Prog., 1,5MB data	<b>6ES7515-2FM02-0AB0</b> CPU 1515F-2 PN, 750KB Prog., 3MB Data	<b>6ES7516-3FN02-0AB0</b> CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
<b>General information</b>				
Product type designation	CPU 1511F-1 PN	CPU 1513F-1 PN	CPU 1515F-2 PN	CPU 1516F-3 PN/DP
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1AK01-0AB0	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1AL01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7515-2AM01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3AN01-0AB0
<b>Display</b>				
Screen diagonal [cm]	3.45 cm	3.45 cm	6.1 cm	6.1 cm
<b>Supply voltage</b>				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
<b>Memory</b>				
<b>Work memory</b>				
• integrated (for program)	225 kbyte	450 kbyte	750 kbyte	1.5 Mbyte
• integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte	5 Mbyte
<b>Load memory</b>				
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
<b>CPU processing times</b>				
for bit operations, typ.	60 ns	40 ns	30 ns	10 ns
for word operations, typ.	72 ns	48 ns	36 ns	12 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns	16 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns	64 ns
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	2 048	2 048	2 048	2 048
<b>IEC counter</b>				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>				
• Number	2 048	2 048	2 048	2 048
<b>IEC timer</b>				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>				
<b>Flag</b>				
• Size, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>				
<b>Clock</b>				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
<b>1. Interface</b>				
<b>Interface types</b>				
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
<b>Protocols</b>				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

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# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Fail-safe CPUs

#### Technical specifications

Article number	<b>6ES7511-1FK02-0AB0</b> CPU 1511F-1PN, 225KB prog, 1MB data	<b>6ES7513-1FL02-0AB0</b> CPU 1513F-1 PN, 450KB Prog., 1,5MB data	<b>6ES7515-2FM02-0AB0</b> CPU 1515F-2 PN, 750KB Prog.,3MB Data	<b>6ES7516-3FN02-0AB0</b> CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
<b>PROFINET IO Controller</b>				
<b>Services</b>				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes	Yes
- PROFinergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	128	256	256
- of which in line, max.	128	128	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>				
<b>Services</b>				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- IRT	Yes	Yes	Yes	Yes
- PROFinergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
<b>2. Interface</b>				
<b>Interface types</b>				
• RJ 45 (Ethernet)			Yes; X2	Yes; X2
• Number of ports			1	1
• integrated switch			No	No
<b>Protocols</b>				
• IP protocol			Yes; IPv4	Yes; IPv4
• PROFINET IO Controller			Yes	Yes
• PROFINET IO Device			Yes	Yes
• SIMATIC communication			Yes	Yes
• Open IE communication			Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server			Yes	Yes
• Media redundancy			No	No

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

Fail-safe CPUs

### Technical specifications

Article number	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0
	CPU 1511F-1PN, 225KB prog, 1MB data	CPU 1513F-1 PN, 450KB Prog., 1,5MB data	CPU 1515F-2 PN, 750KB Prog., 3MB Data	CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
<b>PROFINET IO Controller</b>				
<b>Services</b>				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- Direct data exchange			No	No
- IRT			No	No
- PROFlenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Number of connectable IO Devices, max.			32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.			32	32
- of which in line, max.			32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.			8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.			8	8
- Updating times			The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>				
<b>Services</b>				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- IRT			No	No
- PROFlenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Shared device			Yes	Yes
- Number of IO Controllers with shared device, max.			4	4
- activation/deactivation of I-devices			Yes; per user program	Yes; per user program
- Asset management record			Yes; per user program	Yes; per user program
<b>3. Interface</b>				
<b>Interface types</b>				
• RS 485				Yes; X3
• Number of ports				1
<b>Protocols</b>				
• PROFIBUS DP master				Yes
• PROFIBUS DP slave				No
• SIMATIC communication				Yes

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Fail-safe CPUs

#### Technical specifications

Article number	<b>6ES7511-1FK02-0AB0</b> CPU 1511F-1PN, 225KB prog, 1MB data	<b>6ES7513-1FL02-0AB0</b> CPU 1513F-1 PN, 450KB Prog., 1,5MB data	<b>6ES7515-2FM02-0AB0</b> CPU 1515F-2 PN, 750KB Prog.,3MB Data	<b>6ES7516-3FN02-0AB0</b> CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
<b>Protocols</b>				
<b>Number of connections</b>				
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>				
<b>Media redundancy</b>				
- Media redundancy	only via 1st interface (X1)	Yes; only via 1st interface (X1)	only via 1st interface (X1)	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50
<b>SIMATIC communication</b>				
• S7 routing	Yes	Yes	Yes	Yes
<b>OPC UA</b>				
• OPC UA Client	Yes	Yes	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes	Yes	Yes
<b>Supported technology objects</b>				
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	800	2 400	2 400
• Required Motion Control resources				
- per speed-controlled axis	40	40	40	40
- per positioning axis	80	80	80	80
- per synchronous axis	160	160	160	160
- per external encoder	80	80	80	80
- per output cam	20	20	20	20
- per cam track	160	160	160	160
- per probe	40	40	40	40
Controller				
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring				
• High-speed counter	Yes	Yes	Yes	Yes



### Technical specifications

Article number	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0
	CPU 1511F-1PN, 225KB prog, 1MB data	CPU 1513F-1 PN, 450KB Prog., 1,5MB data	CPU 1515F-2 PN, 750KB Prog.,3MB Data	CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
<b>Standards, approvals, certificates</b>				
<b>Highest safety class achievable in safety mode</b>				
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>				
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>				
<b>Programming</b>				
<b>Programming language</b>				
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
<b>Know-how protection</b>				
• User program protection/password protection	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes
<b>Access protection</b>				
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Width	35 mm	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>				
Weight, approx.	405 g	405 g	830 g	845 g

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Fail-safe CPUs

#### Technical specifications

Article number	<b>6ES7517-3FP00-0AB0</b> CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	<b>6ES7518-4FP00-0AB0</b> CPU 1518F-4 PN/DP, 6 MB Prog., 20MB Data	<b>6ES7518-4FX00-1AC0</b> CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
<b>General information</b>			
Product type designation	CPU 1517F-3PN/DP	CPU 1518F-4PN/DP	CPU 1518F-4 PN/DP MFP
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V13 Update 3 (FW V1.6) or higher	V17 (FW V2.9) / V13 (FW V1.5) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher
<b>Display</b>			
Screen diagonal [cm]	6.1 cm	6.1 cm	6.1 cm
<b>Supply voltage</b>			
Type of supply voltage	24 V DC	24 V DC	24 V DC
<b>Memory</b>			
<b>Work memory</b>			
• integrated (for program)	3 Mbyte	9 Mbyte	9 Mbyte
• integrated (for data)	8 Mbyte	60 Mbyte	60 Mbyte
• integrated (for CPU function library of CPU Runtime)			50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
<b>Working memory for additional functions</b>			
• Integrated (for C/C++ Runtime application)			512 Mbyte
<b>Load memory</b>			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte; The memory card must have at least 2 GB of space on it
<b>CPU processing times</b>			
for bit operations, typ.	2 ns	1 ns	1 ns
for word operations, typ.	3 ns	2 ns	2 ns
for fixed point arithmetic, typ.	3 ns	2 ns	2 ns
for floating point arithmetic, typ.	12 ns	6 ns	6 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>			
<b>Clock</b>			
• Type	Hardware clock	Hardware clock	Hardware clock

### Technical specifications

Article number	<b>6ES7517-3FP00-0AB0</b> CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	<b>6ES7518-4FP00-0AB0</b> CPU 1518F-4 PN/DP, 6 MB Prog., 20MB Data	<b>6ES7518-4FX00-1AC0</b> CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
<b>1. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
<b>Protocols</b>			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
<b>PROFINET IO Controller</b>			
<b>Services</b>			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max.	512	512	512
- of which in line, max.	512	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>			
<b>Services</b>			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	Yes	Yes; Minimum send cycle of 250 µs	Yes; Minimum send cycle of 250 µs
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Fail-safe CPUs

#### Technical specifications

Article number	<b>6ES7517-3FP00-0AB0</b>	<b>6ES7518-4FP00-0AB0</b>	<b>6ES7518-4FX00-1AC0</b>
	CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518F-4 PN/DP, 6 MB Prog, 20MB Data	CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
<b>2. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)	Yes; X2	Yes; X2	Yes; X2
• Number of ports	1	1	1
• integrated switch	No	No	No
<b>Protocols</b>			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
<b>PROFINET IO Controller</b>			
<b>Services</b>			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Direct data exchange	No	No	No
- IRT	No	No	No
- PROFlenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	No	No	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128	128	128
- of which in line, max.	128	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>			
<b>Services</b>			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFlenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	No	No	No
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program

### Technical specifications

Article number	<b>6ES7517-3FP00-0AB0</b> CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	<b>6ES7518-4FP00-0AB0</b> CPU 1518F-4 PN/DP, 6 MB Prog, 20MB Data	<b>6ES7518-4FX00-1AC0</b> CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
<b>3. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)		Yes; X3	Yes; X3
• RS 485	Yes; X3		
• Number of ports	1	1	1; C/C++ Runtime can also be reached via this port
• integrated switch		No	No
<b>Protocols</b>			
• IP protocol		Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		No	No
• PROFINET IO Device		No	No
• PROFIBUS DP master	Yes		
• PROFIBUS DP slave	No		
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication		Yes	Yes
• Web server		Yes	Yes
<b>PROFIBUS DP master</b>			
• Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	
<b>4. Interface</b>			
<b>Interface types</b>			
• RS 485		Yes; X4	Yes; X4
• Number of ports		1	1
<b>Protocols</b>			
• PROFIBUS DP master		Yes	Yes
• PROFIBUS DP slave		No	No
• SIMATIC communication		Yes	Yes
<b>PROFIBUS DP master</b>			
• Number of DP slaves, max.		125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>			
<b>Number of connections</b>			
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>			
<b>Media redundancy</b>			
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	Yes; as ring node according to IEC 62439-2 Edition 2.0	Yes; as ring node according to IEC 62439-2 Edition 2.0	Yes; as ring node according to IEC 62439-2 Edition 2.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50
<b>SIMATIC communication</b>			
• S7 routing	Yes	Yes	Yes
<b>OPC UA</b>			
• OPC UA Client	Yes	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions			Yes

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Fail-safe CPUs

#### Technical specifications

Article number	<b>6ES7517-3FP00-0AB0</b> CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	<b>6ES7518-4FP00-0AB0</b> CPU 1518F-4 PN/DP, 6 MB Prog., 20MB Data	<b>6ES7518-4FX00-1AC0</b> CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
<b>Supported technology objects</b>			
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	10 240	15 360	15 360
• Required Motion Control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
Controller			
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring			
• High-speed counter	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
<b>Highest safety class achievable in safety mode</b>			
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>			
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

### Technical specifications

Article number	<b>6ES7517-3FP00-0AB0</b> CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	<b>6ES7518-4FP00-0AB0</b> CPU 1518F-4 PN/DP, 6 MB Prog., 20MB Data	<b>6ES7518-4FX00-1AC0</b> CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
<b>Access protection</b>			
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Write protection for Failsafe		Yes	
• Protection level: Complete protection	Yes	Yes	Yes
<b>Open Development interfaces</b>			
• Size of ODK SO file, max.			9.8 Mbyte
<b>Dimensions</b>			
Width	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
<b>Weights</b>			
Weight, approx.	1 978 g	1 988 g	2 117 g

## SIMATIC S7-1500 Advanced Controllers

### Central processing units

#### SIPLUS fail-safe CPUs

##### Overview SIPLUS CPU 1513F-1 PN



- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the SIPLUS S7-1500 Controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

##### Overview SIPLUS CPU 1515F-2 PN



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 Controller product range
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.



### Overview SIPLUS CPU 1516F-3 PN/DP



- The CPU with a large program and data memory in the SIPLUS S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders.
- Integrated web server with the option of creating user-defined Web pages.

#### Note:

SIMATIC Memory Card required for operation of the CPU

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

### Overview SIPLUS CPU 1518F-4 PN/DP



- The CPU with a very large program and data memory in the SIPLUS S7-1500 Controller product range for fail-safe applications with highest requirements regarding program scope, performance and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined Web pages.

#### Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### SIPLUS fail-safe CPUs

Ordering data	Article No.	Article No.
<b>SIPLUS CPU 1513F-1 PN</b> (extended temperature range and exposure to media) Fail-safe CPU, 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	<b>6AG1513-1FL02-2AB0</b>	<b>Accessories</b> <b>System power supply</b> (extended temperature range and exposure to media) For supplying the backplane bus of the S7-1500 PLC 24 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W 120/230 V AC input voltage, power 60 W <b>Load current supply</b> (extended temperature range and exposure to media) 24 V DC/3 A 24 V DC/8 A <b>Display</b> (extended temperature range and exposure to media) For SIPLUS CPU 1513F-1 PN; spare part For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part For SIPLUS CPU 1518-4F PN/DP; spare part <b>Other accessories</b> See SIMATIC S7-1500, fail-safe CPUs, page 4/40
<b>SIPLUS CPU 1515F-2 PN</b> (extended temperature range and exposure to media) Fail-safe CPU, 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch; PROFINET RT interface; SIMATIC Memory Card required	<b>6AG1515-2FM02-2AB0</b>	<b>6AG1505-0KA00-7AB0</b> <b>6AG1505-0RA00-7AB0</b> <b>6AG1507-0RA00-7AB0</b> <b>6AG1332-4BA00-7AA0</b> <b>6AG1333-4BA00-7AA0</b>
<b>SIPLUS CPU 1516F-3 PN/DP</b> (extended temperature range and exposure to media) Fail-safe CPU, 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	<b>6AG1516-3FN02-2AB0</b>	<b>6AG1591-1AB00-2AA0</b> <b>6AG1591-1BB00-2AA0</b> <b>6AG1591-1BA02-2AA0</b>
<b>CPU 1518F-4 PN/DP</b> (Exposure to media) Fail-safe CPU, 6 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	<b>6AG1518-4FP00-4AB0</b>	

### Technical specifications

Article number	<b>6AG1513-1FL02-2AB0</b>	<b>6AG1515-2FM02-2AB0</b>	<b>6AG1516-3FN02-2AB0</b>	<b>6AG1518-4FP00-4AB0</b>
Based on	<b>6ES7513-1FL02-0AB0</b> SIPLUS S7-1500 CPU 1513F-1 PN	<b>6ES7515-2FM02-0AB0</b> SIPLUS S7-1500 CPU 1515F-2 PN	<b>6ES7516-3FN02-0AB0</b> SIPLUS S7-1500 CPU 1516F-3 PN/DP	<b>6ES7518-4FP00-0AB0</b> SIPLUS S7-1500 CPU 1518F-4 PN/DP
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	0 °C
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin	-40 °C; = Tmin	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### SIPLUS fail-safe CPUs

#### Technical specifications

Article number	6AG1513-1FL02-2AB0	6AG1515-2FM02-2AB0	6AG1516-3FN02-2AB0	6AG1518-4FP00-4AB0
Based on	6ES7513-1FL02-0AB0 SIPLUS S7-1500 CPU 1513F-1 PN	6ES7515-2FM02-0AB0 SIPLUS S7-1500 CPU 1515F-2 PN	6ES7516-3FN02-0AB0 SIPLUS S7-1500 CPU 1516F-3 PN/DP	6ES7518-4FP00-0AB0 SIPLUS S7-1500 CPU 1518F-4 PN/DP
<b>Relative humidity</b>				
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4		Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04		Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## SIMATIC S7-1500 Advanced Controllers

### Central processing units

#### Redundant CPUs

##### Overview CPU 1513R-1 PN



- The CPU for applications with medium requirements for program scope and processing speed, and increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as the central controller in production lines with distributed I/O
- PROFINET IO RT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU

##### Overview CPU 1517H-3 PN



- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU

##### Overview CPU 1515R-2 PN



- The CPU for applications with medium/high requirements for program scope, networking and processing speed, and with increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1518HF-4 PN



- The CPU for applications with high availability requirements, also in connection with functional safety requirements
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLE according to ISO 13849
- A very large program data memory enables the realization of extensive applications.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O
- Supports PROFIsafe in distributed configurations
- PROFINET IO RT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP addresses
- PROFINET IO controller for operating distributed I/O on PROFINET

#### Note:

SIMATIC Memory Card required for operation of the CPU

### Ordering data

Ordering data	Article No.
<b>CPU 1513R-1 PN</b> SIMATIC S7-1500R CPU, 300 KB work memory for program, 1.5 MB for data, PROFINET RT interface with 2-port switch; SIMATIC Memory Card required	<b>6ES7513-1RL00-0AB0</b>
<b>CPU 1515R-2 PN</b> SIMATIC S7-1500R CPU, 450 KB work memory for program, 3 MB for data, PROFINET RT interface with 2-port switch, PROFINET interface; SIMATIC Memory Card required	<b>6ES7515-2RM00-0AB0</b>
<b>CPU 1517H-3 PN</b> SIMATIC S7-1500H CPU, 2 MB work memory for program, 8 MB for data, 1st PROFINET RT interface with 2-port switch, 2nd PROFINET interface, 3rd interface synchronization, command times for bit operations 4 ns; SIMATIC Memory Card required	<b>6ES7517-3HP00-0AB0</b>
<b>SIMATIC S7-1500H CPU 1517H System Bundle</b> Comprising 2 CPUs 517H-3 PN, 4 synchronization modules up to 10 m, 2 FOC synchronization cables (1 m)	<b>6ES7500-0HP00-0AB0</b>
<b>CPU 1518HF-4 PN</b> SIMATIC S7-1500H CPU, 9 MB work memory for program, 60 MB for data, 1st PROFINET RT interface with 2-port switch, 2nd PROFINET interface, 3rd PROFINET interface, 4th/5th interface synchronization, command times for bit operations 4 ns; SIMATIC Memory Card required	<b>6ES7518-4JP00-0AB0</b>
<b>SIMATIC S7-1500HF CPU 1518HF System Bundle</b> Comprising 2 CPUs 518HF-4 PN, 4 synchronization modules up to 10 m, 2 FOC synchronization cables (1 m)	<b>6ES7 500-0JP00-0AB0</b>

### Article No.

Accessories	Article No.
<b>Synchronization modules</b> For patch cable FOC up to 10 m	<b>6ES7960-1CB00-0AA5</b>
For routing cable FOC up to 10 km	<b>6ES7960-1FB00-0AA5</b>
<b>Synchronization connecting cables FOC for S7-1500H</b> Length 1 m	<b>6ES7960-1BB00-5AA5</b>
Length 2 m	<b>6ES7960-1BC00-5AA5</b>
Length 10 m	<b>6ES7960-1CB00-5AA5</b>
<b>SIMATIC Memory Card</b> 4 MB	<b>6ES7954-8LC03-0AA0</b>
12 MB	<b>6ES7954-8LE03-0AA0</b>
24 MB	<b>6ES7954-8LF03-0AA0</b>
256 MB	<b>6ES7954-8LL03-0AA0</b>
2 GB	<b>6ES7954-8LP03-0AA0</b>
32 GB	<b>6ES7954-8LT03-0AA0</b>
<b>SIMATIC S7-1500 DIN rail</b> Fixed lengths, with grounding elements <ul style="list-style-type: none"> <li>• 160 mm</li> <li>• 245 mm</li> <li>• 482 mm</li> <li>• 530 mm</li> <li>• 830 mm</li> </ul> For cutting to length by customer, without drill holes; grounding elements must be ordered separately <ul style="list-style-type: none"> <li>• 2 000 mm</li> </ul>	<b>6ES7590-1AB60-0AA0</b> <b>6ES7590-1AC40-0AA0</b> <b>6ES7590-1AE80-0AA0</b> <b>6ES7590-1AF30-0AA0</b> <b>6ES7590-1AJ30-0AA0</b>  <b>6ES7590-1BC00-0AA0</b>
<b>PE connection element for 2 000 mm DIN rail</b> 20 units	<b>6ES7590-5AA00-0AA0</b>

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Redundant CPUs

#### Ordering data

##### System power supply

For supplying the backplane bus of the S7-1500 Controller

24 V DC input voltage, power 25 W

**6ES7505-0KA00-0AB0**

24/48/60 V DC input voltage, power 60 W

**6ES7505-0RA00-0AB0**

24/48/60 V DC input voltage, power 60 W, buffering functionality

**6ES7505-0RB00-0AB0**

120/230 V AC input voltage, power 60 W

**6ES7507-0RA00-0AB0**

##### Power plug

With coding element for power supply module; spare part, 10 units

**6ES7590-8AA00-0AA0**

##### Load current supply

24 V DC/3 A

**6EP1332-4BA00**

24 V DC/8 A

**6EP1333-4BA00**

##### Power supply connector

Spare part; for connecting the 24 V DC supply voltage

- With push-in terminals

**6ES7193-4JB00-0AA0**

##### IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

##### IE FC RJ45 plug 180

180° cable outlet

1 unit

**6GK1901-1BB10-2AA0**

10 units

**6GK1901-1BB10-2AB0**

50 units

**6GK1901-1BB10-2AE0**

##### IE FC TP standard cable GP 2x2

**6XV1840-2AH10**

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

##### IE FC TP trailing cable 2 x 2 (type C)

**6XV1840-3AH10**

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

##### IE FC TP marine cable 2 x 2 (type B)

**6XV1840-4AH10**

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

##### IE FC stripping tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**6GK1901-1GA00**

##### Display

For CPU 1513R-1 PN; spare part

**6ES7591-1AA01-0AA0**

For CPU 1515R-2 PN, CPU 1517H-3 PN, CPU 1518HF-4 PN; spare part

**6ES7591-1BA02-0AA0**

##### STEP 7 Professional V17 (required for S7-1500R/H)

Target system:  
SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

Requirement:

- Windows 10 (64-bit)
- Windows 10 Professional Version 1909, 2004, 20H2
- Windows 10 Enterprise Version 1909, 2004, 20H2
- Windows 10 IoT Enterprise 2016 LTSC
- Windows 10 IoT Enterprise 2019 LTSC

- Windows Server (64-bit)
- Windows Server 2016 Standard (full installation)
- Windows Server 2019 Standard (full installation)

Type of delivery:

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V17, floating license

**6ES7822-1AA07-0YA5**

STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>

**6ES7822-1AE07-0YA5**

Email address required for delivery

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current Manual Collection DVD and the three subsequent updates

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Redundant CPUs

#### Technical specifications

Article number	<b>6ES7513-1RL00-0AB0</b> CPU 1513R-1 PN, 300KB program/1,5MB data	<b>6ES7515-2RM00-0AB0</b> CPU 1515R-2 PN, 500KB program/ 3MB data	<b>6ES7517-3HP00-0AB0</b> CPU 1517H-3 PN, 2MB program/8MB data	<b>6ES7518-4JP00-0AB0</b> CPU 1518HF-4 PN, 9MB program/60MB data
<b>General information</b>				
Product type designation	CPU 1513R-1 PN	CPU 1515R-2 PN	CPU 1517H-3 PN	CPU 1518HF-4PN
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V16 (FW V2.8) / V15.1 (FW V2.6)	V17 (FW V2.9) / V16 (FW V2.8) / V15.1 (FW V2.6)	V17 (FW V2.9) / V16 (FW V2.8) / V15.1 (FW V2.6)	V17
<b>Display</b>				
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm
<b>Supply voltage</b>				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
<b>Memory</b>				
<b>Work memory</b>				
• integrated (for program)	300 kbyte	500 kbyte	2 Mbyte	9 Mbyte
• integrated (for data)	1.5 Mbyte	3 Mbyte	8 Mbyte	60 Mbyte
<b>Load memory</b>				
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
<b>CPU processing times</b>				
for bit operations, typ.	80 ns	60 ns	4 ns	4 ns
for word operations, typ.	96 ns	72 ns	6 ns	6 ns
for fixed point arithmetic, typ.	128 ns	96 ns	6 ns	6 ns
for floating point arithmetic, typ.	512 ns	384 ns	24 ns	24 ns
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	2 048	2 048	2 048	2 048
<b>IEC counter</b>				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>				
• Number	2 048	2 048	2 048	2 048
<b>IEC timer</b>				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>				
<b>Flag</b>				
• Size, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>				
<b>Clock</b>				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
<b>1. Interface</b>				
<b>Interface types</b>				
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
<b>Protocols</b>				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	No	No	No	No
• SIMATIC communication	Yes; Only Server	Yes; Only Server	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes	Yes	Yes	Yes; Optionally also encrypted
• Web server	No	No	No	No
• Media redundancy	Yes	Yes	Yes	Yes

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Redundant CPUs

#### Technical specifications

Article number	6ES7513-1RL00-0AB0	6ES7515-2RM00-0AB0	6ES7517-3HP00-0AB0	6ES7518-4JP00-0AB0
	CPU 1513R-1 PN, 300KB program/1,5MB data	CPU 1515R-2 PN, 500KB program/ 3MB data	CPU 1517H-3 PN, 2MB program/8MB data	CPU 1518HF-4 PN, 9MB program/60MB data
<b>PROFINET IO Controller</b>				
<b>Services</b>				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- IRT	No	No	No	No
- PROFinergy	Yes	Yes	Yes	Yes; per user program
- Number of connectable IO Devices, max.	64	64	256	256
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data		
<b>2. Interface</b>				
<b>Interface types</b>				
• RJ 45 (Ethernet)		Yes; X2	Yes; X2	Yes; X2
• Number of ports		1	1	1
• integrated switch		No	No	No
<b>Protocols</b>				
• IP protocol		Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		No	No	No
• PROFINET IO Device		No	No	No
• SIMATIC communication		Yes; Only Server	Yes; Only Server	Yes; Only Server
• Open IE communication		Yes	Yes	Yes; Optionally also encrypted
• Web server		No	No	No
• Media redundancy		No	No	No
<b>3. Interface</b>				
Interface type			Pluggable synchronization submodule (FO)	
Plug-in interface modules			Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5	
<b>Interface types</b>				
• RJ 45 (Ethernet)				Yes; X3
• Number of ports				1
• integrated switch				No
<b>Protocols</b>				
• IP protocol				Yes; IPv4
• SIMATIC communication				Yes; Only Server
• Open IE communication				Yes
<b>4. Interface</b>				
Interface type			Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules			Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5	Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5



# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Redundant CPUs

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#### Technical specifications

Article number	<b>6ES7513-1RL00-0AB0</b> CPU 1513R-1 PN, 300KB program/1,5MB data	<b>6ES7515-2RM00-0AB0</b> CPU 1515R-2 PN, 500KB program/ 3MB data	<b>6ES7517-3HP00-0AB0</b> CPU 1517H-3 PN, 2MB program/8MB data	<b>6ES7518-4JP00-0AB0</b> CPU 1518HF-4 PN, 9MB program/60MB data
<b>Protocols</b>				
<b>Number of connections</b>				
• Number of connections, max.	88	108	288	320
<b>Redundancy mode</b>				
<b>Media redundancy</b>				
- Media redundancy				only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No	No	No	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP	200 ms; PROFINET MRP	200 ms; PROFINET MRP	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50; Only 16 are recommended, however	50; Only 16 are recommended, however	50	50
<b>SIMATIC communication</b>				
• S7 routing	No	Yes	Yes	Yes
<b>OPC UA</b>				
• OPC UA Client	No	No	No	No
• OPC UA Server	No	No	No	No
<b>Supported technology objects</b>				
Motion Control	No	No	No	No
Controller				
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes	Yes	Yes	Yes
• High-speed counter	No	No	No	No
<b>Standards, approvals, certificates</b>				
<b>Highest safety class achievable in safety mode</b>				
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>				
- Low demand mode: PFDavg in accordance with SIL3				< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3				< 1.00E-09
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Redundant CPUs

#### Technical specifications

Article number	<b>6ES7513-1RL00-0AB0</b> CPU 1513R-1 PN, 300KB program/1,5MB data	<b>6ES7515-2RM00-0AB0</b> CPU 1515R-2 PN, 500KB program/ 3MB data	<b>6ES7517-3HP00-0AB0</b> CPU 1517H-3 PN, 2MB program/8MB data	<b>6ES7518-4JP00-0AB0</b> CPU 1518HF-4 PN, 9MB program/60MB data
<b>Configuration</b>				
<b>Programming</b>				
<b>Programming language</b>				
- LAD	Yes	Yes	Yes	Yes; incl. failsafe
- FBD	Yes	Yes	Yes	Yes; incl. failsafe
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC	No	No	No	
- GRAPH	Yes	Yes	Yes	Yes
<b>Know-how protection</b>				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Copy protection	No	No	No	Yes
• Block protection	Yes	Yes	Yes	Yes
<b>Access protection</b>				
• protection of confidential configuration data	Yes	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Write protection for Failsafe				Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Width	35 mm	70 mm	210 mm	210 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>				
Weight, approx.	430 g	830 g	2 119 g; Interface modules: 2x 18 g	

### Overview SIPLUS CPU 1515R-2 PN

- The CPU for applications with medium/high requirements for program scope, networking and processing speed, and with increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

#### Note:

SIMATIC Memory Card required for operation of the CPU

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

### Overview SIPLUS CPU 1517H-3 PN



- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

#### Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS CPU 1515R-2 PN

(extended temperature range and exposure to media)

SIPLUS S7-1500R CPU,  
500 KB work memory for program,  
3 MB for data,  
PROFINET RT interface  
with 2-port switch,  
PROFINET interface;  
SIMATIC Memory Card required

6AG1515-2RM00-7AB0

#### SIPLUS CPU 1517H-3 PN

(extended temperature range and exposure to media)

SIPLUS S7-1500H CPU,  
2 MB work memory for program,  
8 MB for data,  
1st PROFINET RT interface  
with 2-port switch,  
2nd PROFINET RT interface,  
3rd interface synchronization,  
command times for  
bit operations 4 ns;  
SIMATIC Memory Card required

6AG1517-3HP00-4AB0

#### SIPLUS S7-1500 CPU 1517H System Bundle

(extended temperature range and exposure to media)

Comprising  
2 SIPLUS CPU 1517H-3 PN,  
4 SIPLUS synchronization  
modules up to 10 m,  
2 FOC synchronization cables (1 m);  
without memory card

6AG1500-0HP00-4AB0

#### Accessories

##### Synchronization modules

(extended temperature range and exposure to media)

- For patch cable FOC up to 10 m
- For routing cable FOC up to 10 km

6AG1960-1CB00-4AA5  
6AG1960-1FB00-4AA5

##### System power supply

(extended temperature range and exposure to media)

For supplying the backplane bus of  
the S7-1500 PLC

24 V DC input voltage, power 25 W

6AG1505-0KA00-7AB0

24/48/60 V DC input voltage,  
power 60 W

6AG1505-0RA00-7AB0

120/230 V AC input voltage,  
power 60 W

6AG1507-0RA00-7AB0

##### Load current supply

(extended temperature range and exposure to media)

24 V DC/3 A

6AG1332-4BA00-7AA0

24 V DC/8 A

6AG1333-4BA00-7AA0

##### Display

(extended temperature range and exposure to media)

For SIPLUS CPU 1515R-2 PN/DP  
and CPU 1517H-3 PN; spare part

6AG1591-1BA02-2AA0

##### Other accessories

See SIMATIC S7-1500,  
CPU 1515R-2 PN, page 4/59

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### SIPLUS redundant CPUs

#### Technical specifications

Article number	<b>6AG1515-2RM00-7AB0</b>	<b>6AG1517-3HP00-4AB0</b>
Based on	<b>6ES7515-2RM00-0AB0</b> SIPLUS S7-1500 CPU 1515R-2 PN	<b>6ES7517-3HP00-0AB0</b> SIPLUS S7-1500 CPU 1517H-3 PN
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>	-40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C 70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	0 °C; = Tmin 60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C 0 °C; = Tmin 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

### Overview CPU 1511T-1 PN



- Entry-level CPU in the S7-1500T Controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
 

Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.

User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1511TF-1 PN



- Entry-level CPU in the S7-1500T Controller product range
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central PLC in production lines with central and distributed I/O
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
 

Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.

User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

## SIMATIC S7-1500 Advanced Controllers

### Central processing units

#### Technology CPUs

##### Overview CPU 1515T-2 PN



- The CPU for applications with medium to high requirements regarding program/data storage in the S7-1500T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

#### Note:

SIMATIC Memory Card required for operation of the CPU.

##### Overview CPU 1515TF-2 PN



- The CPU for standard and fail-safe applications with medium to high requirements regarding program/data storage in the S7-1500T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Isochronous mode centrally and distributed
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

#### Note:

SIMATIC Memory Card required for operation of the CPU.

### Overview CPU 1516T-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

**Note:**

SIMATIC Memory Card required for operation of the CPU.

### Overview CPU 1516TF-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 Controller product range for standard and fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

**Note:**

SIMATIC Memory Card required for operation of the CPU.

## SIMATIC S7-1500 Advanced Controllers

Central processing units

### Technology CPUs

#### Overview CPU 1517T-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

#### Overview CPU 1517TF-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.



### Overview CPU 1518T-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

### Overview CPU 1518TF-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Technology CPUs

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Ordering data	Article No.	Ordering data	Article No.
<b>CPU 1511T-1 PN</b> 225 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	6ES7511-1TK01-0AB0	<b>Accessories</b> <b>SIMATIC Memory Card</b> 4 MB 12 MB 24 MB 256 MB 2 GB 32 GB	6ES7954-8LC03-0AA0 6ES7954-8LE03-0AA0 6ES7954-8LF03-0AA0 6ES7954-8LL03-0AA0 6ES7954-8LP03-0AA0 6ES7954-8LT03-0AA0
<b>CPU 1511TF-1 PN</b> 225 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	6ES7511-1UK01-0AB0	<b>SIMATIC S7-1500 DIN rail</b> Fixed lengths, with grounding elements • 160 mm • 245 mm • 482 mm • 530 mm • 830 mm For cutting to length by customer, without drill holes; grounding elements must be ordered separately • 2 000 mm	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 6ES7590-1AJ30-0AA0 6ES7590-1BC00-0AA0
<b>CPU 1515T-2 PN</b> 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required	6ES7515-2TM01-0AB0	<b>PE connection element for            2 000 mm DIN rail</b> 20 units	6ES7590-5AA00-0AA0
<b>CPU 1515TF-2 PN</b> 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required	6ES7515-2UM01-0AB0	<b>System power supply</b> For supplying the backplane bus of the S7-1500 Controller 24 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W 24/48/60 V DC input voltage, power 60 W, buffering functionality 120/230 V AC input voltage, power 60 W	6ES7505-0KA00-0AB0 6ES7505-0RA00-0AB0 6ES7505-0RB00-0AB0 6ES7507-0RA00-0AB0
<b>CPU 1516T-3 PN/DP</b> 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7516-3TN00-0AB0	<b>Power plug</b> With coding element for power supply module; spare part, 10 units	6ES7590-8AA00-0AA0
<b>CPU 1516TF-3 PN/DP</b> 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7516-3UN00-0AB0	<b>Load current supply</b> 24 V DC/3 A 24 V DC/8 A	6EP1332-4BA00 6EP1333-4BA00
<b>CPU 1517T-3 PN/DP</b> 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7517-3TP00-0AB0	<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage • With push-in terminals	6ES7193-4JB00-0AA0
<b>CPU 1517TF-3 PN/DP</b> 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7517-3UP00-0AB0	<b>PROFIBUS FastConnect RS 485            bus connector with 90° cable            outlet</b> With insulation displacement, max. transmission rate 12 Mbps Without programming device interface, grounding via control cabinet contact surface; 1 unit With programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BA70-0XA0 6ES7972-0BB70-0XA0
<b>CPU 1518T-4 PN/DP</b> 9 MB work memory for program, 60 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7518-4TP00-0AB0	<b>PROFIBUS FC standard cable GP</b> Standard type with special design for quick mounting, 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0EH10
<b>CPU 1518TF-4 PN/DP</b> 9 MB work memory for program, 60 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7518-4UP00-0AB0		

Ordering data	Article No.	Article No.
<b>PROFIBUS FC robust cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0JH10	<b>IE FC TP trailing cable 2 x 2 (type C)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m
<b>PROFIBUS FC flexible cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1831-2K	
<b>PROFIBUS FC trailing cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m  Sheath color: Petrol Sheath color: Violet	6XV1830-3EH10 6XV1831-2L	<b>IE FC TP marine cable 2 x 2 (type B)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m
<b>PROFIBUS FC food cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0GH10	
<b>PROFIBUS FC ground cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-3FH10	<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables  <b>Display</b> For CPU 1511T-1 PN and CPU 1511TF-1 PN; spare part  For CPU 1515T-2 PN, CPU 1515TF-2 PN, CPU 1516T-3 PN/DP, CPU 1516TF-3 PN/DP, CPU 1517T-3 PN/DP, CPU 1517TF-3 PN/DP, CPU 1518T-4 PN/DP and CPU 1518TF-4 PN/DP; spare part
<b>PROFIBUS FC FRNC cable GP</b> 2-wire, shielded, flame-retardant, with copolymer protective jacket FRNC; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0LH10	
<b>PROFIBUS FastConnect stripping tool</b> Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00	<b>Front cover for PROFIBUS DP interface</b> For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		
<b>IE FC RJ45 plug 180</b> 180° cable outlet  1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	<b>SIMATIC S7-1500T Starter Kit</b> Comprising: CPU 1511T-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-2AH10	

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Technology CPUs

#### Ordering data

##### STEP 7 Professional V17

Target system:  
SIMATIC S7-1200, S7-1500,  
S7-300, S7-400, WinAC

##### Requirement:

- Windows 10 (64-bit)
- Windows 10 Professional Version 1909, 2004, 20H2
  - Windows 10 Enterprise Version 1909, 2004, 20H2
  - Windows 10 IoT Enterprise 2016 LTSB
  - Windows 10 IoT Enterprise 2019 LTSC
  - Windows Server (64-bit)
  - Windows Server 2016 Standard (full installation)
  - Windows Server 2019 Standard (full installation)

##### Type of delivery:

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V17,  
floating license

STEP 7 Professional V17,  
floating license,  
software download including  
license key <sup>1)</sup>

Email address required for delivery

#### Article No.

**6ES7822-1AA07-0YA5**

**6ES7822-1AE07-0YA5**

#### Article No.

##### STEP 7 Safety Advanced V17

##### Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

##### Requirement:

STEP 7 Professional V17

##### Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user;  
license key on USB flash drive

Floating license for 1 user;  
license key for download <sup>1)</sup>;  
Email address required for delivery

**6ES7833-1FA17-0YA5**

**6ES7833-1FA17-0YH5**

##### SIMATIC Manual Collection

Electronic manuals on DVD, multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC Distributed I/O,  
SIMATIC HMI, SIMATIC sensors,  
SIMATIC NET, SIMATIC PC-based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC software, SIMATIC TDC

**6ES7998-8XC01-8YE0**

##### SIMATIC Manual Collection update service for 1 year

Current Manual Collection DVD and the three subsequent updates

**6ES7998-8XC01-8YE2**

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

#### Technical specifications

Article number	<b>6ES7511-1TK01-0AB0</b>	<b>6ES7515-2TM01-0AB0</b>	<b>6ES7516-3TN00-0AB0</b>	<b>6ES7517-3TP00-0AB0</b>	<b>6ES7518-4TP00-0AB0</b>
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
<b>General information</b>					
Product type designation	CPU 1511T-1 PN	CPU 1515T-2 PN	CPU 1516T-3 PN/DP	CPU 1517T-3 PN/DP	CPU 1518T-4 PN/DP
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/integrated from version	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / V17 (FW V2.9) or higher
<b>Display</b>					
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm	6.1 cm
<b>Supply voltage</b>					
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
<b>Memory</b>					
<b>Work memory</b>					
• integrated (for program)	225 kbyte	750 kbyte	1.5 Mbyte	3 Mbyte	9 Mbyte
• integrated (for data)	1 Mbyte	3 Mbyte	5 Mbyte	8 Mbyte	60 Mbyte
<b>Load memory</b>					
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte

### Technical specifications

Article number	<b>6ES7511-1TK01-0AB0</b> CPU 1511T-1PN, 225KB progr., 1MB data	<b>6ES7515-2TM01-0AB0</b> CPU 1515T-2 PN, 750KB progr, 3MB data	<b>6ES7516-3TN00-0AB0</b> CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	<b>6ES7517-3TP00-0AB0</b> CPU 1517T-3 PN/DP, 3MB prog./8MB data	<b>6ES7518-4TP00-0AB0</b> CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
<b>CPU processing times</b>					
for bit operations, typ.	60 ns	30 ns	10 ns	2 ns	1 ns
for word operations, typ.	72 ns	36 ns	12 ns	3 ns	2 ns
for fixed point arithmetic, typ.	96 ns	48 ns	16 ns	3 ns	2 ns
for floating point arithmetic, typ.	384 ns	192 ns	64 ns	12 ns	6 ns
<b>Counters, timers and their retentivity</b>					
<b>S7 counter</b>					
• Number	2 048	2 048	2 048	2 048	2 048
<b>IEC counter</b>					
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>					
• Number	2 048	2 048	2 048	2 048	2 048
<b>IEC timer</b>					
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>					
<b>Flag</b>					
• Size, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>					
<b>I/O address area</b>					
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>					
<b>Clock</b>					
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock	Hardware clock
<b>1. Interface</b>					
<b>Interface types</b>					
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes	Yes
<b>Protocols</b>					
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes	Yes	Yes

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Technology CPUs

#### Technical specifications

Article number	<b>6ES7511-1TK01-0AB0</b>	<b>6ES7515-2TM01-0AB0</b>	<b>6ES7516-3TN00-0AB0</b>	<b>6ES7517-3TP00-0AB0</b>	<b>6ES7518-4TP00-0AB0</b>
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
<b>PROFINET IO Controller</b>					
<b>Services</b>					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes	Yes	Yes
- PROFinergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	256	256	512	512
- of which in line, max.	128	256	256	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>					
<b>Services</b>					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No	No
- IRT	Yes	Yes	Yes	Yes	Yes; Minimum send cycle of 250 µs
- PROFinergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
<b>2. Interface</b>					
<b>Interface types</b>					
• RJ 45 (Ethernet)		Yes; X2	Yes; X2	Yes; X2	Yes; X2
• Number of ports		1	1	1	1
• integrated switch		No	No	No	No
<b>Protocols</b>					
• IP protocol		Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		Yes	Yes	Yes	Yes
• PROFINET IO Device		Yes	Yes	Yes	Yes
• SIMATIC communication		Yes	Yes	Yes	Yes
• Open IE communication		Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server		Yes	Yes	Yes	Yes
• Media redundancy		No	No	No	No

### Technical specifications

Article number	6ES7511-1TK01-0AB0	6ES7515-2TM01-0AB0	6ES7516-3TN00-0AB0	6ES7517-3TP00-0AB0	6ES7518-4TP00-0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
<b>PROFINET IO Controller</b>					
<b>Services</b>					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- Direct data exchange		No	No	No	No
- IRT		No	No	No	No
- PROFlenergy		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		No	No	No	No
- Number of connectable IO Devices, max.		32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.		32	32	128	128
- of which in line, max.		32	32	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.		8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.		8	8	8	8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>					
<b>Services</b>					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- IRT		No	No	No	No
- PROFlenergy		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		No	No	No	No
- Shared device		Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.		4	4	4	4
- activation/deactivation of I-devices		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
<b>3. Interface</b>					
<b>Interface types</b>					
• RJ 45 (Ethernet)					Yes; X3
• RS 485			Yes; X3	Yes; X3	
• Number of ports			1	1	1
• integrated switch					No

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Technology CPUs

#### Technical specifications

Article number	<b>6ES7511-1TK01-0AB0</b> CPU 1511T-1PN, 225KB progr., 1MB data	<b>6ES7515-2TM01-0AB0</b> CPU 1515T-2 PN, 750KB progr, 3MB data	<b>6ES7516-3TN00-0AB0</b> CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	<b>6ES7517-3TP00-0AB0</b> CPU 1517T-3 PN/DP, 3MB prog./8MB data	<b>6ES7518-4TP00-0AB0</b> CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
<b>Protocols</b>					
<ul style="list-style-type: none"> <li>• IP protocol</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> <li>• SIMATIC communication</li> <li>• Open IE communication</li> <li>• Web server</li> </ul>			Yes	Yes	Yes
<b>PROFIBUS DP master</b>					
<ul style="list-style-type: none"> <li>• Number of DP slaves, max.</li> </ul>			125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	
<b>4. Interface</b>					
<b>Interface types</b>					
<ul style="list-style-type: none"> <li>• RS 485</li> <li>• Number of ports</li> </ul>					Yes; X4 1
<b>Protocols</b>					
<ul style="list-style-type: none"> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> <li>• SIMATIC communication</li> </ul>					Yes No Yes
<b>PROFIBUS DP master</b>					
<ul style="list-style-type: none"> <li>• Number of DP slaves, max.</li> </ul>					125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>					
<b>Number of connections</b>					
<ul style="list-style-type: none"> <li>• Number of connections, max.</li> </ul>	96; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>					
<b>Media redundancy</b>					
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50	50
<b>SIMATIC communication</b>					
<ul style="list-style-type: none"> <li>• S7 routing</li> </ul>	Yes	Yes	Yes	Yes	Yes



### Technical specifications

Article number	6ES7511-1TK01-0AB0	6ES7515-2TM01-0AB0	6ES7516-3TN00-0AB0	6ES7517-3TP00-0AB0	6ES7518-4TP00-0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
<b>OPC UA</b>					
• OPC UA Client	Yes	Yes	Yes	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes	Yes	Yes	Yes
<b>Supported technology objects</b>					
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	2 400	6 400	10 240	15 360
• Required Motion Control resources					
- per speed-controlled axis	40	40	40	40	40
- per positioning axis	80	80	80	80	80
- per synchronous axis	160	160	160	160	160
- per external encoder	80	80	80	80	80
- per output cam	20	20	20	20	20
- per cam track	160	160	160	160	160
- per probe	40	40	40	40	40
• Number of available Extended Motion Control resources for technology objects	40	120	192	256	512
• Required Extended Motion Control resources					
- per cam (1 000 points and 50 segments)	2	2	2	2	2
- per cam (10 000 points and 50 segments)	20	20	20	20	20
- for each set of kinematics	30	30	30	30	30
- Per leading axis proxy	3	3	3	3	3
<b>Controller</b>					
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
<b>Counting and measuring</b>					
• High-speed counter	Yes	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Technology CPUs

#### Technical specifications

Article number	<b>6ES7511-1TK01-0AB0</b>	<b>6ES7515-2TM01-0AB0</b>	<b>6ES7516-3TN00-0AB0</b>	<b>6ES7517-3TP00-0AB0</b>	<b>6ES7518-4TP00-0AB0</b>
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
<b>Altitude during operation relating to sea level</b>					
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>					
<b>Programming</b>					
<b>Programming language</b>					
- LAD	Yes	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes
<b>Know-how protection</b>					
<ul style="list-style-type: none"> <li>User program protection/password protection</li> <li>Copy protection</li> <li>Block protection</li> </ul>	Yes	Yes	Yes	Yes	Yes
<b>Access protection</b>					
<ul style="list-style-type: none"> <li>protection of confidential configuration data</li> <li>Password for display</li> <li>Protection level: Write protection</li> <li>Protection level: Read/write protection</li> <li>Protection level: Complete protection</li> </ul>	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>					
Width	35 mm	70 mm	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>					
Weight, approx.	430 g	830 g	1 978 g	1 978 g	1 988 g
Article number	<b>6ES7511-1UK01-0AB0</b>	<b>6ES7515-2UM01-0AB0</b>	<b>6ES7516-3UN00-0AB0</b>	<b>6ES7517-3UP00-0AB0</b>	<b>6ES7518-4UP00-0AB0</b>
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB data	CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	CPU 1517TF-3 PN/DP, 3MB prog., 8MB data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
<b>General information</b>					
Product type designation	CPU 1511TF-1 PN	CPU 1515TF-2 PN	CPU 1516TF-3 PN/DP	CPU 1517TF-3 PN/DP	CPU 1518TF-4 PN/DP
<b>Engineering with</b>					
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/ integrated from version</li> </ul>	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / V14 (FW V2.1) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / V17 (FW V2.9) or higher
<b>Display</b>					
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm	6.1 cm
<b>Supply voltage</b>					
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
<b>Memory</b>					
<b>Work memory</b>					
<ul style="list-style-type: none"> <li>integrated (for program)</li> <li>integrated (for data)</li> </ul>	225 kbyte 1 Mbyte	750 kbyte 3 Mbyte	1.5 Mbyte 5 Mbyte	3 Mbyte 8 Mbyte	9 Mbyte 60 Mbyte
<b>Load memory</b>					
<ul style="list-style-type: none"> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte

### Technical specifications

Article number	<b>6ES7511-1UK01-0AB0</b> CPU 1511TF-1PN, 225KB progr., 1MB data	<b>6ES7515-2UM01-0AB0</b> CPU 1515TF-2 PN, 750KB progr, 3MB data	<b>6ES7516-3UN00-0AB0</b> CPU 1516TF-3 PN/DP, 1.5MB prog./,5MB data	<b>6ES7517-3UP00-0AB0</b> CPU 1517TF-3 PN/DP, 3MB prog., 8MB data	<b>6ES7518-4UP00-0AB0</b> CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
<b>CPU processing times</b>					
for bit operations, typ.	60 ns	30 ns	10 ns	2 ns	1 ns
for word operations, typ.	72 ns	36 ns	12 ns	3 ns	2 ns
for fixed point arithmetic, typ.	96 ns	48 ns	16 ns	3 ns	2 ns
for floating point arithmetic, typ.	384 ns	192 ns	64 ns	12 ns	6 ns
<b>Counters, timers and their retentivity</b>					
<b>S7 counter</b>					
• Number	2 048	2 048	2 048	2 048	2 048
<b>IEC counter</b>					
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>					
• Number	2 048	2 048	2 048	2 048	2 048
<b>IEC timer</b>					
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>					
<b>Flag</b>					
• Size, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>					
<b>I/O address area</b>					
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>					
<b>Clock</b>					
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock	Hardware clock
<b>1. Interface</b>					
<b>Interface types</b>					
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes	Yes
<b>Protocols</b>					
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes	Yes	Yes

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Technology CPUs

#### Technical specifications

Article number	6ES7511-1UK01-0AB0	6ES7515-2UM01-0AB0	6ES7516-3UN00-0AB0	6ES7517-3UP00-0AB0	6ES7518-4UP00-0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB data	CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	CPU 1517TF-3 PN/DP, 3MB prog., 8MB data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
<b>PROFINET IO Controller</b>					
<b>Services</b>					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes	Yes	Yes
- PROFlenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	256	256	512	512
- of which in line, max.	128	256	256	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>					
<b>Services</b>					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No	No
- IRT	Yes	Yes	Yes	Yes	Yes; Minimum send cycle of 250 µs
- PROFlenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
<b>2. Interface</b>					
<b>Interface types</b>					
• RJ 45 (Ethernet)		Yes; X2	Yes; X2	Yes; X2	Yes; X2
• Number of ports		1	1	1	1
• integrated switch		No	No	No	No
<b>Protocols</b>					
• IP protocol		Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		Yes	Yes	Yes	Yes
• PROFINET IO Device		Yes	Yes	Yes	Yes
• SIMATIC communication		Yes	Yes	Yes	Yes
• Open IE communication		Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server		Yes	Yes	Yes	Yes
• Media redundancy		No	No	No	No

### Technical specifications

Article number	6ES7511-1UK01-0AB0 CPU 1511TF-1PN, 225KB progr., 1MB data	6ES7515-2UM01-0AB0 CPU 1515TF-2 PN, 750KB progr, 3MB data	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data	6ES7518-4UP00-0AB0 CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
<b>PROFINET IO Controller</b>					
<b>Services</b>					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- Direct data exchange		No	No	No	No
- IRT		No	No	No	No
- PROFlenergy		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		No	No	No	No
- Number of connectable IO Devices, max.		32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.		32	32	128	128
- of which in line, max.		32	32	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.		8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.		8	8	8	8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>					
<b>Services</b>					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- IRT		No	No	No	No
- PROFlenergy		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		No	No	No	No
- Shared device		Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.		4	4	4	4
- activation/deactivation of I-devices		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
<b>3. Interface</b>					
<b>Interface types</b>					
• RJ 45 (Ethernet)					Yes; X3
• RS 485			Yes; X3	Yes; X3	
• Number of ports			1	1	1
• integrated switch					No
<b>Protocols</b>					
• IP protocol					Yes; IPv4
• PROFINET IO Controller					No
• PROFINET IO Device					No
• PROFIBUS DP master			Yes	Yes	
• PROFIBUS DP slave			No	No	
• SIMATIC communication			Yes	Yes	Yes
• Open IE communication					Yes
• Web server					Yes

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Technology CPUs

#### Technical specifications

Article number	6ES7511-1UK01-0AB0	6ES7515-2UM01-0AB0	6ES7516-3UN00-0AB0	6ES7517-3UP00-0AB0	6ES7518-4UP00-0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB data	CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	CPU 1517TF-3 PN/DP, 3MB prog., 8MB data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
<b>PROFIBUS DP master</b>					
• Number of DP slaves, max.			125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	
<b>4. Interface</b>					
<b>Interface types</b>					
• RS 485					Yes; X4
• Number of ports					1
<b>Protocols</b>					
• PROFIBUS DP master					Yes
• PROFIBUS DP slave					No
• SIMATIC communication					Yes
<b>PROFIBUS DP master</b>					
• Number of DP slaves, max.					125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>					
<b>Number of connections</b>					
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>					
<b>Media redundancy</b>					
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50	50
<b>SIMATIC communication</b>					
• S7 routing	Yes	Yes	Yes	Yes	Yes
<b>OPC UA</b>					
• OPC UA Client	Yes	Yes	Yes	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes	Yes	Yes	Yes

### Technical specifications

Article number	6ES7511-1UK01-0AB0 CPU 1511TF-1PN, 225KB progr., 1MB data	6ES7515-2UM01-0AB0 CPU 1515TF-2 PN, 750KB progr, 3MB data	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data	6ES7518-4UP00-0AB0 CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
<b>Supported technology objects</b>					
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	2 400	6 400	10 240	15 360
• Required Motion Control resources					
- per speed-controlled axis	40	40	40	40	40
- per positioning axis	80	80	80	80	80
- per synchronous axis	160	160	160	160	160
- per external encoder	80	80	80	80	80
- per output cam	20	20	20	20	20
- per cam track	160	160	160	160	160
- per probe	40	40	40	40	40
• Number of available Extended Motion Control resources for technology objects	40	120	192	256	512
• Required Extended Motion Control resources					
- per cam (1 000 points and 50 segments)	2	2	2	2	2
- per cam (10 000 points and 50 segments)	20	20	20	20	20
- for each set of kinematics	30	30	30	30	30
- Per leading axis proxy	3	3	3	3	3
Contoller					
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring					
• High-speed counter	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
<b>Highest safety class achievable in safety mode</b>					
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>					
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09 1/h	< 1.00E-09 1/h	< 1.00E-09
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off

# SIMATIC S7-1500 Advanced Controllers

## Central processing units

### Technology CPUs

#### Technical specifications

Article number	<b>6ES7511-1UK01-0AB0</b> CPU 1511TF-1PN, 225KB progr., 1MB data	<b>6ES7515-2UM01-0AB0</b> CPU 1515TF-2 PN, 750KB progr, 3MB data	<b>6ES7516-3UN00-0AB0</b> CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	<b>6ES7517-3UP00-0AB0</b> CPU 1517TF-3 PN/DP, 3MB prog., 8MB data	<b>6ES7518-4UP00-0AB0</b> CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
<b>Altitude during operation relating to sea level</b>					
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>					
<b>Programming</b>					
<b>Programming language</b>					
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes
<b>Know-how protection</b>					
<ul style="list-style-type: none"> <li>User program protection/password protection</li> <li>Copy protection</li> <li>Block protection</li> </ul>	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
<b>Access protection</b>					
<ul style="list-style-type: none"> <li>protection of confidential configuration data</li> <li>Password for display</li> <li>Protection level: Write protection</li> <li>Protection level: Read/write protection</li> <li>Protection level: Write protection for Failsafe</li> <li>Protection level: Complete protection</li> </ul>	Yes Yes Yes; Specific write protection both for Standard and for Failsafe Yes Yes Yes	Yes Yes Yes; Specific write protection both for Standard and for Failsafe Yes Yes Yes	Yes Yes Yes; Specific write protection both for Standard and for Failsafe Yes Yes Yes	Yes Yes Yes; Specific write protection both for Standard and for Failsafe Yes Yes Yes	Yes Yes Yes; Specific write protection both for Standard and for Failsafe Yes Yes Yes
<b>Dimensions</b>					
Width	35 mm	70 mm	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>					
Weight, approx.	430 g	830 g	1 978 g	1 978 g	1 988 g



## Overview



- 16, 32 and 64-channel digital input modules
- Sinking and sourcing input versions available
- For flexible adaptation of the PLC to the corresponding task
- For subsequent expansion of the system with additional inputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

## Ordering data

## SM 521 digital input modules

## Module width 35 mm

16 inputs, 24 V DC High Feature, isolated, parameterizable diagnostics and hardware interrupts

6ES7521-1BH00-0AB0

32 inputs, 24 V DC High Feature, isolated, parameterizable diagnostics and hardware interrupts

6ES7521-1BL00-0AB0

64 inputs, 24 V DC Basic, sinking/sourcing, input delay 3.2 ms; cables and terminal blocks can be ordered separately (SIMATIC TOP connect)

6ES7521-1BP00-0AA0

16 inputs, 24 V DC basic, isolated, input delay 3.2 ms

6ES7521-1BH50-0AA0

16 inputs, 230 V AC basic, isolated, input delay 20 ms

6ES7521-1FH00-0AA0

16 inputs, 24 ... 125 V UC High Feature, input delay 0.05 ... 20 ms, parameterizable diagnostics and hardware interrupts

6ES7521-7EH00-0AB0

Module width 25 mm; front connector (push-in) included in scope of delivery

16 inputs, 24 V DC basic, isolated

6ES7521-1BH10-0AA0

32 inputs, 24 V DC basic, isolated

6ES7521-1BL10-0AA0

## Accessories

## Front connectors

For 35 mm modules (not 64-channel); including four potential bridges, cable ties and individual labeling strips, 40-pin

- Screw terminals
- Push-in

6ES7592-1AM00-0XB0

6ES7592-1BM00-0XB0

For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part

6ES7592-1BM00-0XA0

## Potential bridges for front connectors

## Article No.

6ES7592-3AA00-0AA0

For 35 mm modules; 20 pieces; spare part

## DIN A4 labeling sheets

For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray

6ES7592-2AX00-0AA0

For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray

6ES7592-1AX00-0AA0

## U connector

5 units; spare part

6ES7590-0AA00-0AA0

## Universal front door for I/O modules

For 35 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams per front door; spare part

6ES7528-0AA00-7AA0

For 25 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams per front door; spare part

6ES7528-0AA00-0AA0

## SIMATIC Manual Collection

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

6ES7998-8XC01-8YE0

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6ES7998-8XC01-8YE2

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 521 digital input modules

### Technical specifications

Article number	6ES7521-1BH00-0AB0 S7-1500, DI 16x24VDC HF	6ES7521-1BL00-0AB0 S7-1500, DI 32x24VDC HF	6ES7521-1BH50-0AA0 S7-1500, DI 16x24VDC SRC BA	6ES7521-1FH00-0AA0 S7-1500, DI 16x230VAC BA	6ES7521-7EH00-0AB0 S7-1500, DI 16 x 24...125V UC HF
<b>General information</b>					
Product type designation	DI 16x24VDC HF	DI 32x24VDC HF	DI 16x24VDC SRC BA	DI 16x230VAC BA	DI 16x24 ... 125 V UC HF
<b>Product function</b>					
• Isochronous mode	Yes	Yes	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes	Yes
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1 / -	V12 / V12	V12 / V12	V13 SP1 / -
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	Yes	Yes	No	No	No
• Oversampling	No	No			No
• MSI	Yes	Yes	Yes	Yes	Yes
<b>Supply voltage</b>					
Rated value (DC)	24 V	24 V			
Reverse polarity protection	Yes	Yes			
<b>Digital inputs</b>					
Number of digital inputs	16	32	16	16	16
Digital inputs, parameterizable	Yes	Yes	No	No	Yes
Source/sink input	P-reading	P-reading	Sourcing	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 1				Yes	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes		Yes; At 24 V DC
<b>Digital input functions, parameterizable</b>					
• Gate start/stop	Yes	Yes			
• Freely usable digital input	Yes	Yes			
<b>Input voltage</b>					
• Rated value (DC)	24 V	24 V	24 V		24 V; 48 V, 125 V
- 24 V DC	Yes	Yes	Yes		Yes
• Rated value (AC)				230 V; 120/230 V AC, 50/60 Hz	24 V; 48 V, 125 V (50 - 60 Hz)
• for signal "0"	-30 to +5 V	-30 to +5 V	-5 to +30V	0V AC to 40V AC	-5 ... +5 V
• for signal "1"	+11 to +30V	+11 to +30V	-11 to -30V	79V AC to 264V AC	+11 ... +146 V
<b>Input current</b>					
• for signal "1", typ.	2.5 mA	2.5 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC	3 mA; At 24 V DC
<b>Input delay (for rated value of input voltage)</b>					
<b>for standard inputs</b>					
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms parameterizable with DC, 20 ms fixed with AC
<b>for interrupt inputs</b>					
- parameterizable	Yes	Yes	No	No	Yes
<b>for technological functions</b>					
- parameterizable	Yes	Yes	No	No	No
<b>Encoder</b>					
<b>Connectable encoders</b>					
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	2 mA	1.5 mA

## Technical specifications

Article number	6ES7521-1BH00-0AB0 S7-1500, DI 16x24VDC HF	6ES7521-1BL00-0AB0 S7-1500, DI 32x24VDC HF	6ES7521-1BH50-0AA0 S7-1500, DI 16x24VDC SRC BA	6ES7521-1FH00-0AA0 S7-1500, DI 16x230VAC BA	6ES7521-7EH00-0AB0 S7-1500, DI 16 x 24...125V UC HF
<b>Isochronous mode</b>					
Filtering and processing time (TCI), min.	80 µs; At 50 µs filter time	80 µs; At 50 µs filter time			
Bus cycle time (TDP), min.	250 µs	250 µs			
<b>Interrupts/diagnostics/status information</b>					
Diagnostics function	Yes	Yes	No	No	Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	No	No	Yes
• Hardware interrupt	Yes	Yes	No	No	Yes
<b>Diagnoses</b>					
• Monitoring the supply voltage	Yes	Yes	No	No	No
• Wire-break	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No	Yes; To I < 550 µA
• Short-circuit	No	No	No	No	No
<b>Diagnostics indication LED</b>					
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	No	No	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	No	No	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED	No	Yes; red LED	Yes; red LED
<b>Potential separation</b>					
<b>Potential separation channels</b>					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
Suitable for safety functions	No	No	No	No	No
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-30 °C; From FS05	-30 °C; From FS05	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS05	-30 °C; From FS05	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual		
<b>Dimensions</b>					
Width	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>					
Weight, approx.	240 g	260 g	230 g	300 g	240 g

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 521 digital input modules

### Technical specifications

Article number	<b>6ES7521-1BP00-0AA0</b> S7-1500, DI 64x24VDC SNK/SRC BA
<b>General information</b>	
Product type designation	DI 64x24VDC BA
<b>Product function</b>	
• Isochronous mode	No
• Prioritized startup	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 0319 / V17
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.35 / -
<b>Operating mode</b>	
• DI	Yes
• Counter	No
• Oversampling	No
• MSI	Yes
<b>Digital inputs</b>	
Number of digital inputs	64
Digital inputs, parameterizable	No
Source/sink input	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Number of simultaneously controllable inputs</b>	
• Number of simultaneously controllable inputs	64; see additional description in the manual
<b>Input voltage</b>	
• Rated value (DC)	24 V
- 24 V DC	Yes
• for signal *0*	-5 ... +5 V (reference potential is COM)
• for signal *1*	-11 ... -30 V; +11 ... +30 V (reference potential is COM)
<b>Input current</b>	
• for signal *1*, typ.	2.7 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- parameterizable	No
<b>for interrupt inputs</b>	
- parameterizable	No
<b>for technological functions</b>	
- parameterizable	No
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA

Article number	<b>6ES7521-1BP00-0AA0</b> S7-1500, DI 64x24VDC SNK/SRC BA
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	No
<b>Alarms</b>	
• Diagnostic alarm	No
• Hardware interrupt	No
<b>Diagnoses</b>	
• Monitoring the supply voltage	No
• Wire-break	No
• Short-circuit	No
• Group error	No
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	No
• for module diagnostics	No
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	No
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	250 g
<b>Other</b>	
Note:	Please order cable and connection modules separately

## Technical specifications

Article number	6ES7521-1BH10-0AA0 S7-1500, DI 16x24VDC BA	6ES7521-1BL10-0AA0 S7-1500, DI 32x24VDC BA
<b>General information</b>		
Product type designation	DI 16 x 24 V DC BA	DI 32x24VDC BA
<b>Product function</b>		
• Isochronous mode	No	No
• Prioritized startup	Yes	Yes
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13	V13 / V13
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -
<b>Operating mode</b>		
• DI	Yes	Yes
• Counter	No	No
• MSI	Yes	Yes
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
<b>Digital inputs</b>		
Number of digital inputs	16	32
Digital inputs, parameterizable	No	No
Source/sink input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
- 24 V DC	Yes	Yes
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal "1", typ.	2.7 mA	2.7 mA
<b>Input delay (for rated value of input voltage)</b>		
<b>for standard inputs</b>		
- parameterizable	No	No
<b>for interrupt inputs</b>		
- parameterizable	No	No
<b>for technological functions</b>		
- parameterizable	No	No
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 521 digital input modules

### Technical specifications

Article number	<b>6ES7521-1BH10-0AA0</b> S7-1500, DI 16x24VDC BA	<b>6ES7521-1BL10-0AA0</b> S7-1500, DI 32x24VDC BA
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	No	No
<b>Alarms</b>		
• Diagnostic alarm	No	No
• Hardware interrupt	No	No
<b>Diagnoses</b>		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	No	No
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Standards, approvals, certificates</b>		
Suitable for safety functions	No	No
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	230 g	260 g
<b>Other</b>		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

## Overview



- 8, 32, 16 and 64-channel digital output modules
- Sinking and sourcing output versions available
- For flexible adaptation of the PLC to the corresponding task
- For subsequent expansion of the system with additional outputs
- High Feature modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

## Ordering data

## SM 522 digital output modules

Module width 35 mm

8 outputs, 24 V DC,  
2 A High Feature, isolated

6ES7522-1BF00-0AB0

16 outputs, 24 V DC,  
0.5 A High Feature, isolated

6ES7522-1BH01-0AB0

32 outputs, 24 V DC,  
0.5 A High Feature, isolated

6ES7522-1BL01-0AB0

64 outputs, 24 V DC;  
0.3A Basic; sinking output;  
cables and terminal blocks  
can be ordered separately  
(SIMATIC TOP connect)

6ES7522-1BP00-0AAA0

64 outputs, 24 V DC;  
0.3A Basic; sourcing;  
cables and terminal blocks  
can be ordered separately  
(SIMATIC TOP connect)

6ES7522-1BP50-0AAA0

8 relay outputs, 230 V AC,  
5 A Standard

6ES7522-5HF00-0AB0

16 relay outputs, 230 V AC,  
2 A Standard

6ES7522-5HH00-0AB0

8 outputs (triac), 230 V AC,  
2 A Standard

6ES7522-5FF00-0AB0

16 outputs (triac), 230 V AC,  
1 A Standard

6ES7522-5FH00-0AB0

16 outputs, 24 ... 48 V UC,  
125 V DC, 0.5 A Standard, isolated

6ES7522-5EH00-0AB0

Module width 25 mm;  
front connector (push-in)  
included in scope of delivery

16 outputs, 24 V DC,  
0.5 A Basic, isolated

6ES7 522-1BH10-0AAA0

32 outputs, 24 V DC,  
0.5 A Basic, isolated

6ES7 522-1BL10-0AAA0

## Accessories

## Front connectors

For 35 mm modules  
(not 64-channel);  
including four potential bridges,  
cable ties and individual labeling  
strips, 40-pin

- Screw terminals
- Push-in

6ES7592-1AM00-0XB0

6ES7592-1BM00-0XB0

For 25 mm modules;  
including cable ties and  
individual labeling strips;  
push-in terminal 40-pin;  
spare part

6ES7592-1BM00-0XA0

## Potential bridges for front connectors

For 35 mm modules;  
20 pieces; spare part

6ES7592-3AA00-0AAA0

## DIN A4 labeling sheets

For 35 mm modules;  
10 sheets with 10 labeling strips  
each for I/O modules; perforated,  
Al gray

6ES7592-2AX00-0AAA0

For 25 mm modules;  
10 sheets with 20 labeling strips  
each for I/O modules; perforated,  
Al gray

6ES7592-1AX00-0AAA0

## U connector

5 units; spare part

6ES7590-0AA00-0AAA0

## Universal front door for I/O modules

For 35 mm modules;  
5 front doors; with 5 labeling strips  
on the front and 5 cabling diagrams  
per front door; spare part

6ES7528-0AA00-7AAA0

For 25 mm modules;  
5 front doors; with 5 labeling strips  
on the front and 5 cabling diagrams  
per front door; spare part

6ES7528-0AA00-0AAA0

## SIMATIC Manual Collection

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SIMATIC PG/PC, SIMATIC S7,  
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6ES7998-8XC01-8YE0

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and the three subsequent updates

6ES7998-8XC01-8YE2

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 522 digital output modules

### Technical specifications

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
<b>General information</b>				
Product type designation	DQ 16x24VDC/0.5A HF	DQ 32x24VDC/0.5A HF	DQ 8x24VDC/2A HF	DQ 16x24 ... 48 V UC/ 125 V DC/0.5 A ST
<b>Product function</b>				
• Isochronous mode	Yes	Yes	No	No
• Prioritized startup	Yes	Yes	Yes	Yes
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	Yes; with an application	No
• PWM	No	No	Yes	No
• Cam control (switching at comparison values)	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes	Yes	Yes	No
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group	Yes; through internal protection with 10 A per group	
<b>Digital outputs</b>				
Type of digital output	Transistor	Transistor	Transistor	Transistor
Number of digital outputs	16	32	8	16
Current-sinking				Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	Yes; Clocked electronically	Yes; Clocked electronically	Yes	
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	-17 V	200 V (suppressor diode)
Controlling a digital input	Yes	Yes	Yes	Yes
<b>Digital output functions, parameterizable</b>				
• Freely usable digital output			Yes	
• PWM output			Yes	
- Number, max.			2	
<b>Switching capacity of the outputs</b>				
• with resistive load, max.	0.5 A	0.5 A		0.5 A
• on lamp load, max.	5 W	5 W	10 W	40 W; At 125 V DC, 10 W at 48 V UC, 5 W at 24 V UC
<b>Load resistance range</b>				
• lower limit	48 Ω	48 Ω	12 Ω	
• upper limit	12 kΩ	12 kΩ	4 kΩ	
<b>Output voltage</b>				
• Type of output voltage	DC	DC	DC	UC
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.0 V)
<b>Output current</b>				
• for signal "1" rated value	0.5 A	0.5 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	



## Technical specifications

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
<b>Output delay with resistive load</b>				
• "0" to "1", typ.			80 µs	
• "0" to "1", max.	100 µs	100 µs	100 µs	5 ms
• "1" to "0", typ.			300 µs	
• "1" to "0", max.	500 µs	500 µs	500 µs	5 ms
<b>Parallel switching of two outputs</b>				
• for logic links	Yes	Yes	Yes	Yes
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
<b>Switching frequency</b>				
• with resistive load, max.	100 Hz	100 Hz	100 Hz; With PWM operation: 500 Hz	25 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13; max. 500 Hz with PWM operation only with external circuit; see additional description in the manual	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz
<b>Total current of the outputs</b>				
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual	2 A; see additional description in the manual	0.5 A
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual	8 A; see additional description in the manual	0.5 A
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual	16 A; see additional description in the manual	8 A
<b>Isochronous mode</b>				
Execution and activation time (TCO), min.	70 µs	70 µs		
Bus cycle time (TDP), min.	250 µs	250 µs		
<b>Interrupts/diagnostics/status information</b>				
Diagnostics function	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	No
• Maintenance interrupt	Yes	Yes	Yes	No
<b>Diagnoses</b>				
• Monitoring the supply voltage	Yes	Yes	Yes	No
• Wire-break	Yes	Yes	No	No
• Short-circuit	Yes	Yes	Yes	No
• Group error	Yes	Yes	Yes	
<b>Diagnostics indication LED</b>				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
<b>Potential separation</b>				
<b>Potential separation channels</b>				
• between the channels and backplane bus	Yes	Yes	Yes	Yes

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 522 digital output modules

### Technical specifications

Article number	<b>6ES7522-1BH01-0AB0</b> S7-1500, DQ 16x24V DC/0.5A HF	<b>6ES7522-1BL01-0AB0</b> S7-1500, DQ 32x24VDC/0.5A HF	<b>6ES7522-1BF00-0AB0</b> S7-1500, DQ 8x24VDC/2A HF	<b>6ES7522-5EH00-0AB0</b> S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
<b>Standards, approvals, certificates</b>				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02	Yes; From FS03	Yes; From FS02
<b>Highest safety class achievable for safety-related tripping of standard modules</b>				
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2	SILCL 2
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C; From FS03	-30 °C; From FS03		0 °C
• horizontal installation, max.	60 °C	60 °C		60 °C
• vertical installation, min.	-30 °C; From FS03	-30 °C; From FS03		0 °C
• vertical installation, max.	40 °C	40 °C		40 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	
<b>Dimensions</b>				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>				
Weight, approx.	230 g	280 g	240 g	230 g
Article number	<b>6ES7522-5HF00-0AB0</b> S7-1500, DQ 8x230VAC/5A ST (Relay)	<b>6ES7522-5HH00-0AB0</b> S7-1500, DQ 16x230VAC/2A ST (Relay)	<b>6ES7522-5FF00-0AB0</b> S7-1500, DQ 8x230VAC/2A ST (Triac)	<b>6ES7522-5FH00-0AB0</b> S7-1500, DQ 16x230VAC/1A ST (Triac)
<b>General information</b>				
Product type designation	DQ 8x230 V AC/5 A ST (relay)	DQ 16x 230 V AC/2 A ST (relay)	DQ 8x230 V AC/2A ST (triac)	DQ 16x230VAC/1A ST (Triac)
<b>Product function</b>				
• Isochronous mode	No	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/ integrated from version	V12 / V12	V13 SP1 / -	V12 / V12	V13 SP1 / -
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No
• PWM	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes; FW V2.1.0 or higher	Yes; FW V1.1.0 or higher		
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V		
Reverse polarity protection	Yes	Yes		

## Technical specifications

Article number	6ES7522-5HF00-0AB0	6ES7522-5HH00-0AB0	6ES7522-5FF00-0AB0	6ES7522-5FH00-0AB0
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
<b>Digital outputs</b>				
Type of digital output	Relays	Relays	Triac	Triac
Number of digital outputs	8	16	8	16
Current-sinking	Yes	Yes		Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	No	No	No	No
Controlling a digital input	Yes; possible	Yes		
<b>Switching capacity of the outputs</b>				
• with resistive load, max.			2 A	1 A
• on lamp load, max.	1 500 W; 10 000 operating cycles	50 W (230 V AC), 5 W (24 V DC)	50 W	50 W
• Low energy/fluorescent lamps with electronic control gear	10x 58 W (25 000 operating cycles)			
• Fluorescent tubes, conventionally compensated	1x 58 W (25 000 operating cycles)			
• Fluorescent tubes, uncompensated	10x 58 W (25 000 operating cycles)			
<b>Output voltage</b>				
• Type of output voltage			AC	AC
• for signal "1", min.			L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current	L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current
<b>Output current</b>				
• for signal "1" rated value	5 A	2 A	2 A	1 A
• for signal "0" residual current, max.	0 A	0 A	2 mA	2 mA
<b>Output delay with resistive load</b>				
• "0" to "1", max.			1 AC cycle	1 AC cycle
• "1" to "0", max.			1 AC cycle	1 AC cycle
<b>Parallel switching of two outputs</b>				
• for logic links	Yes	Yes	No	No
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
<b>Switching frequency</b>				
• with resistive load, max.	2 Hz	1 Hz	10 Hz	10 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	2 Hz	1 Hz	1 Hz	1 Hz
<b>Total current of the outputs</b>				
• Current per channel, max.	8 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual	1 A; see additional description in the manual
• Current per group, max.	8 A; see additional description in the manual	4 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual
• Current per module, max.	64 A; see additional description in the manual	32 A; see additional description in the manual	10 A; see additional description in the manual	10 A; see additional description in the manual

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 522 digital output modules

### Technical specifications

Article number	6ES7522-5HF00-0AB0	6ES7522-5HH00-0AB0	6ES7522-5FF00-0AB0	6ES7522-5FH00-0AB0
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
<b>Relay outputs</b>				
• Number of relay outputs	8	16		
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V		
• Current consumption of relays (coil current of all relays), typ.	80 mA	150 mA		
• external protection for relay outputs	With miniature circuit breaker with characteristic B for: cos φ 1.0: 600 A cos φ 0.5 ... 0.7: 900 A with 8 A Diazed fuse: 1 000 A	Miniature circuit breaker B10 / B16		
• Contact connection (internal)	No	No		
• Number of operating cycles, max.	4 000 000; see additional description in the manual	see additional description in the manual		
• Relay approved acc. to UL 508	Yes; 250 V AC/5 A g.p.; 120 V AC TV-4 tungsten; A300, R300	No		
<b>Switching capacity of contacts</b>				
- with inductive load, max.	see additional description in the manual	2 A; see additional description in the manual		
- with resistive load, max.	see additional description in the manual	2 A; see additional description in the manual		
<b>Interrupts/diagnostics/status information</b>				
Diagnostics function	Yes		No	No
Substitute values connectable	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	No	No
• Maintenance interrupt		Yes	No	No
<b>Diagnoses</b>				
• Monitoring the supply voltage	Yes	Yes	No	No
• Wire-break	No	No	No	No
• Short-circuit	No	No	No	No
<b>Diagnostics indication LED</b>				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED		
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	No	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
<b>Potential separation</b>				
<b>Potential separation channels</b>				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS03	Yes; From FS02		
<b>Highest safety class achievable for safety-related tripping of standard modules</b>				
• Performance level according to ISO 13849-1	PL c	PL c		
• Category according to ISO 13849-1	Cat. 2	Cat. 2		
• SILCL according to IEC 62061	SILCL 1	SILCL 1		

## Technical specifications

Article number	6ES7522-5HF00-0AB0	6ES7522-5HH00-0AB0	6ES7522-5FF00-0AB0	6ES7522-5FH00-0AB0
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C; From FS03	-25 °C; From FS02	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS03	-25 °C; From FS02	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
<b>Dimensions</b>				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>				
Weight, approx.	350 g	350 g	290 g	310 g
<hr/>				
Article number	6ES7522-1BP00-0AA0	6ES7522-1BP50-0AA0		
	S7-1500, DQ 64x24VDC/0.3A BA	S7-1500, DQ 64x24VDC/0.3A SNK BA		
<b>General information</b>				
Product type designation	DQ 64x24VDC/0.3A BA		DQ 64x24VDC/0.3A SNK BA	
<b>Product function</b>				
• Isochronous mode	No		No	
• Prioritized startup	No		No	
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 0319 / V17		V16 with HSP 0319 / V17	
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -		V5.5 SP3 / -	
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1		V1.0 / V5.1	
• PROFINET from GSD version/ GSD revision	V2.35 / -		V2.35 / -	
<b>Operating mode</b>				
• DQ	Yes		Yes	
• DQ with energy-saving function	No		No	
• PWM	No		No	
• Cam control (switching at comparison values)	No		No	
• Oversampling	No		No	
• MSO	Yes		Yes	
• Integrated operating cycle counter	No		No	
<b>Supply voltage</b>				
Rated value (DC)	24 V		24 V	
Reverse polarity protection	Yes; through internal protection with 7 A per group		Yes; Through internal protection with 4 A per group	
<b>Digital outputs</b>				
Type of digital output	Transistor		Transistor	
Number of digital outputs	64		64	
Current-sinking	No		Yes	
Current-sourcing	Yes		No	
Digital outputs, parameterizable	No		No	
Short-circuit protection	Yes		No; external fusing necessary, max. 4 A per group, tripping characteristic type B or C	
Limitation of inductive shutdown voltage to	L+ (-53 V)		L+ (-53 V)	
Controlling a digital input	Yes		Yes	
<b>Switching capacity of the outputs</b>				
• with resistive load, max.	0.3 A		0.3 A	
• on lamp load, max.	5 W		5 W	
<b>Load resistance range</b>				
• lower limit	80 Ω		80 Ω	
• upper limit	10 kΩ		10 kΩ	

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 522 digital output modules

### Technical specifications

Article number	<b>6ES7522-1BP00-0AA0</b> S7-1500, DQ 64x24VDC/0.3A BA	<b>6ES7522-1BP50-0AA0</b> S7-1500, DQ 64x24VDC/0.3A SNK BA
<b>Output voltage</b>		
• Type of output voltage	DC	DC
• for signal "1", min.	L+ (-0.8 V)	M+ (0.5 V)
<b>Output current</b>		
• for signal "1" rated value	0.3 A	0.3 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
<b>Output delay with resistive load</b>		
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", max.	500 µs	500 µs
<b>Parallel switching of two outputs</b>		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
<b>Total current of the outputs</b>		
• Current per channel, max.	0.3 A	0.3 A
• Current per group, max.	2 A	2 A
• Current per module, max.	8 A	8 A
<b>Total current of the outputs (per module)</b>		
<b>horizontal installation</b>		
- up to 60 °C, max.	8 A	8 A
<b>vertical installation</b>		
- up to 40 °C, max.	8 A	8 A
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	No	No
Substitute values connectable	No	No
<b>Alarms</b>		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
<b>Diagnoses</b>		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	No	No
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; via SIMATIC TOP connect connection module	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; via SIMATIC TOP connect connection module	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	No	No
• for module diagnostics	No	No
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes

## Technical specifications

Article number	6ES7522-1BP00-0AA0 S7-1500, DQ 64x24VDC/0.3A BA	6ES7522-1BP50-0AA0 S7-1500, DQ 64x24VDC/0.3A SNK BA
<b>Standards, approvals, certificates</b>		
Suitable for safety functions	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS01	No
<b>Highest safety class achievable for safety-related tripping of standard modules</b>		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SILCL according to IEC 62061	SILCL 2	
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
<b>Dimensions</b>		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	270 g	270 g
<b>Other</b>		
Note:	Please order cable and connection modules separately	Please order cable and connection modules separately
Article number	6ES7522-1BH10-0AA0 S7-1500, DQ 16x24VDC/0.5A BA	6ES7522-1BL10-0AA0 S7-1500, DQ 32x24VDC/0.5A BA
<b>General information</b>		
Product type designation	DQ 16x24VDC/0.5A BA	DQ 32x24VDC/0.5A BA
<b>Product function</b>		
• Isochronous mode	No	No
• Prioritized startup	Yes	Yes
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13	V13 / V13
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -
<b>Operating mode</b>		
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Oversampling	No	No
• MSO	Yes	Yes
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 522 digital output modules

### Technical specifications

Article number	<b>6ES7522-1BH10-0AA0</b> S7-1500, DQ 16x24VDC/0.5A BA	<b>6ES7522-1BL10-0AA0</b> S7-1500, DQ 32x24VDC/0.5A BA
<b>Digital outputs</b>		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W
<b>Load resistance range</b>		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
<b>Output voltage</b>		
• Type of output voltage	DC	DC
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)
<b>Output current</b>		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
<b>Output delay with resistive load</b>		
• "0" to "1", max.	100 μs	100 μs
• "1" to "0", max.	500 μs	500 μs
<b>Parallel switching of two outputs</b>		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
<b>Total current of the outputs</b>		
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual
<b>Interruptions/diagnostics/status information</b>		
Diagnostics function	No	No
Substitute values connectable	No	No
<b>Alarms</b>		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
<b>Diagnoses</b>		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	No	No
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No



## Technical specifications

Article number	<b>6ES7522-1BH10-0AA0</b> S7-1500, DQ 16x24VDC/0.5A BA	<b>6ES7522-1BL10-0AA0</b> S7-1500, DQ 32x24VDC/0.5A BA
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Standards, approvals, certificates</b>		
Suitable for safety functions	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02
<b>Highest safety class achievable for safety-related tripping of standard modules</b>		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	230 g	280 g
<b>Other</b>		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

## SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

### SM 523 digital input/output modules

#### Overview



- 16 digital inputs and 16 digital outputs (25 mm wide)
- 32 digital inputs, sinking/sourcing / 32 digital outputs, sourcing (35 mm wide)
- For flexible adaptation of the PLC to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces: particularly economical, without parameters or diagnostic functions

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#### Ordering data

##### SM 523 digital input/output module

Module width 35 mm

32 inputs, 24 V DC Basic, sinking/sourcing, input delay 3.2 ms, input type 3 (IEC 61131); 32 outputs, 24 V DC / 0.3 A Basic, sourcing

Module width 25 mm; front connector (push-in) included in scope of delivery

16 inputs, 24 V DC, isolated; 16 outputs, 24 V DC; 0.5 A, isolated

##### Accessories

##### Front connectors

For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part

##### DIN A4 labeling sheets

For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, AI gray

#### Article No.

6ES7523-1BP50-0AA0

6ES7523-1BL00-0AA0

6ES7592-1BM00-0XA0

6ES7592-1AX00-0AA0

#### Article No.

##### U connector

5 units; spare part

##### Universal front door for I/O modules

For 25 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams per front door; spare part

##### SIMATIC Manual Collection

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7590-0AA00-0AA0

6ES7528-0AA00-0AA0

6ES7998-8XC01-8YE0

6ES7998-8XC01-8YE2

## Technical specifications

Article number	<b>6ES7523-1BL00-0AA0</b> S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	<b>6ES7523-1BP50-0AA0</b> S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
<b>General information</b>		
Product type designation	DI 16x24VDC / DQ16x24VDC/0.5A BA	DI 32 x 24 V DC / DQ 32 x 24 V DC/0.3A SNK BA
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
• Prioritized startup	Yes	No
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13	V16 with HSP 0319 / V17
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.35 / -
<b>Operating mode</b>		
• DI	Yes	Yes
• Counter	No	No
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Cam control (switching at comparison values)	No	No
• Oversampling	No	No
• MSI	Yes	Yes
• MSO	Yes	Yes
• Integrated operating cycle counter	No	No
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; Through internal protection with 4 A per group
<b>Digital inputs</b>		
Number of digital inputs	16	32
Digital inputs, parameterizable	No	No
Source/sink input	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
<b>Number of simultaneously controllable inputs</b>		
• Number of simultaneously controllable inputs		32
<b>horizontal installation</b>		
- up to 60 °C, max.		32
<b>vertical installation</b>		
- up to 40 °C, max.		16
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-5 ... +5 V (reference potential is COM)
• for signal "1"	+11 to +30V	-11 ... -30 V; +11 ... +30 V (reference potential is COM)
<b>Input current</b>		
• for signal "1", typ.	2.7 mA	2.7 mA
<b>Input delay (for rated value of input voltage)</b>		
<b>for standard inputs</b>		
- parameterizable	No	No
<b>for interrupt inputs</b>		
- parameterizable	No	No
<b>for technological functions</b>		
- parameterizable		No

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

## SM 523 digital input/output modules

### Technical specifications

Article number	<b>6ES7523-1BL00-0AA0</b> S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	<b>6ES7523-1BP50-0AA0</b> S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
<b>Digital outputs</b>		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sinking	Yes	Yes
Current-sourcing	Yes	No
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	No; external fusing necessary, max. 4 A per group, tripping characteristic type B or C
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	0.5 A	0.3 A
• on lamp load, max.	5 W	5 W
<b>Load resistance range</b>		
• lower limit	48 Ω	80 Ω
• upper limit	12 kΩ	10 kΩ
<b>Output voltage</b>		
• Type of output voltage	DC	DC
• for signal "1", min.	L+ (-0.8 V)	M+ (0.5 V)
<b>Output current</b>		
• for signal "1" rated value	0.5 A	0.3 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
<b>Output delay with resistive load</b>		
• "0" to "1", max.	100 μs	100 μs
• "1" to "0", max.	500 μs	500 μs
<b>Parallel switching of two outputs</b>		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
<b>Total current of the outputs</b>		
• Current per channel, max.	0.5 A; see additional description in the manual	0.3 A
• Current per group, max.	4 A; see additional description in the manual	2 A
• Current per module, max.	8 A; see additional description in the manual	4 A
<b>Total current of the outputs (per module)</b>		
<b>horizontal installation</b>		
- up to 60 °C, max.		4 A
<b>vertical installation</b>		
- up to 40 °C, max.		4 A
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

## Technical specifications

Article number	6ES7523-1BL00-0AA0	6ES7523-1BP50-0AA0
	S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	No	No
Substitute values connectable	No	No
<b>Alarms</b>		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
• Hardware interrupt	No	No
<b>Diagnoses</b>		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	No	No
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	No	No
• for module diagnostics	No	No
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Standards, approvals, certificates</b>		
Suitable for safety-related tripping of standard modules	Yes; From FS03	
<b>Highest safety class achievable for safety-related tripping of standard modules</b>		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SILCL according to IEC 62061	SILCL 2	
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.		-30 °C
• horizontal installation, max.		60 °C
• vertical installation, min.		-30 °C
• vertical installation, max.		40 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m
<b>Dimensions</b>		
Width	25 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	280 g	250 g
<b>Other</b>		
Note:	Supplied incl. 40-pole push-in front connectors	Please order cable and connection modules separately

## SIMATIC S7-1500 Advanced Controllers

I/O modules

SIPLUS digital modules

### SIPLUS SM 521 digital input modules

#### Overview



- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### SIPLUS SM 521 digital input modules

(Extended temperature range and exposure to environmental substances)

16 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts

**6AG1521-1BH00-7AB0**

32 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts

**6AG1521-1BL00-7AB0**

16 inputs, 24 V DC, isolated, input delay 3.2 ms

**6AG1521-1BH50-7AA0**

16 inputs, 230 V AC, isolated, input delay 20 ms

**6AG1521-1FH00-7AA0**

16 inputs, 48 ... 125 V UC, input delay 0.05 ... 20 ms, parameterizable diagnostics and hardware interrupts

**6AG1521-7EH00-7AB0**

#### Accessories

See SIMATIC S7-1500 SM 521 digital input modules, page 4/87

#### Technical specifications

Article number	<b>6AG1521-1BH00-7AB0</b>	<b>6AG1521-1BL00-7AB0</b>	<b>6AG1521-1BH50-7AA0</b>	<b>6AG1521-1FH00-7AA0</b>	<b>6AG1521-7EH00-7AB0</b>
Based on	<b>6ES7521-1BH00-0AB0</b> SIPLUS S7-1500 DI 16X24VDC HF	<b>6ES7521-1BL00-0AB0</b> SIPLUS S7-1500 DI 32X24VDC HF	<b>6ES7521-1BH50-0AA0</b> SIPLUS S7-1500 DI 16X24VDC SRC BA	<b>6ES7521-1FH00-0AA0</b> SIPLUS S7-1500 DI 16X230VAC BA	<b>6ES7521-7EH00-0AB0</b> SIPLUS S7-1500 DI 16X48VUC/125VDC HF
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 16	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. 4 inputs (no adjacent points)
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)

## Technical specifications

Article number	6AG1521-1BH00-7AB0	6AG1521-1BL00-7AB0	6AG1521-1BH50-7AA0	6AG1521-1FH00-7AA0	6AG1521-7EH00-7AB0
Based on	6ES7521-1BH00-0AB0 SIPLUS S7-1500 DI 16X24VDC HF	6ES7521-1BL00-0AB0 SIPLUS S7-1500 DI 32X24VDC HF	6ES7521-1BH50-0AA0 SIPLUS S7-1500 DI 16X24VDC SRC BA	6ES7521-1FH00-0AA0 SIPLUS S7-1500 DI 16X230VAC BA	6ES7521-7EH00-0AB0 SIPLUS S7-1500 DI 16X48VUC/125VDC HF
<b>Relative humidity</b>					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>					
<b>Coolants and lubricants</b>					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

# SIMATIC S7-1500 Advanced Controllers

I/O modules

SIPLUS digital modules

## SIPLUS SM 521 digital input modules

### Technical specifications

Article number	6AG1521-1BH00-7AB0	6AG1521-1BL00-7AB0	6AG1521-1BH50-7AA0	6AG1521-1FH00-7AA0	6AG1521-7EH00-7AB0
Based on	6ES7521-1BH00-0AB0 SIPLUS S7-1500 DI 16X24VDC HF	6ES7521-1BL00-0AB0 SIPLUS S7-1500 DI 32X24VDC HF	6ES7521-1BH50-0AA0 SIPLUS S7-1500 DI 16X24VDC SRC BA	6ES7521-1FH00-0AA0 SIPLUS S7-1500 DI 16X230VAC BA	6ES7521-7EH00-0AB0 SIPLUS S7-1500 DI 16X48VUC/125VDC HF
<b>Usage in industrial process technology</b>					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

4



## Overview



- 8, 16 and 32-channel digital output modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs

## Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information has been added.

## Ordering data

## Article No.

## SIPLUS SM 522 digital output modules

(Extended temperature range and exposure to environmental substances)

8 outputs, 24 V DC; 2 A, isolated	<b>6AG1522-1BF00-7AB0</b>
16 outputs, 24 V DC; 0.5 A, isolated	<b>6AG1522-1BH01-7AB0</b>
32 outputs, 24 V DC; 0.5 A, isolated	<b>6AG1522-1BL01-7AB0</b>
8 relay outputs, 230 V AC, 5 A	<b>6AG1522-5HF00-2AB0</b>
16 relay outputs, 230 V AC, 2 A	<b>6AG1522-5HH00-7AB0</b>
8 outputs (triac), 230 V AC, 2 A	<b>6AG1522-5FF00-7AB0</b>
16 outputs (triac), 230 V AC, 1 A	<b>6AG1522-5FH00-7AB0</b>
16 outputs, 24 ... 48 V UC, 125 V DC, 0.5 A, isolated	<b>6AG1522-5EH00-7AB0</b>

## Accessories

See SIMATIC S7-1500 SM 522 digital output modules, page 4/93

## Technical specifications

Article number	<b>6AG1522-1BF00-7AB0</b>	<b>6AG1522-1BH01-7AB0</b>	<b>6AG1522-1BL01-7AB0</b>	<b>6AG1522-5EH00-7AB0</b>
Based on	<b>6ES7522-1BF00-0AB0</b> SIPLUS S7-1500 DQ 8X24VDC/2A HF	<b>6ES7522-1BH01-0AB0</b> SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	<b>6ES7522-1BL01-0AB0</b> SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	<b>6ES7522-5EH00-0AB0</b> SIPLUS S7-1500 DQ 16x48VUC/125VDC ST
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C Number of simultaneously controllable outputs max. 8x 0.5 A, max. total current per group 2 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; > +60 °C max. 0.25 A per output
• vertical installation, min.	-40 °C; = Tmin			
• vertical installation, max.	40 °C; = Tmax			
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

# SIMATIC S7-1500 Advanced Controllers

I/O modules

SIPLUS digital modules

## SIPLUS SM 522 digital output modules

### Technical specifications

Article number	6AG1522-1BF00-7AB0	6AG1522-1BH01-7AB0	6AG1522-1BL01-7AB0	6AG1522-5EH00-7AB0
Based on	6ES7522-1BF00-0AB0 SIPLUS S7-1500 DQ 8X24VDC/2A HF	6ES7522-1BH01-0AB0 SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	6ES7522-1BL01-0AB0 SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	6ES7522-5EH00-0AB0 SIPLUS S7-1500 DQ 16x48VUC/125VDC ST
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Technical specifications

Article number	6AG1522-5HH00-7AB0	6AG1522-5HF00-2AB0	6AG1522-5FF00-7AB0	6AG1522-5FH00-7AB0
Based on	6ES7522-5HH00-0AB0 SIPLUS S7-1500 16DQ 230VAC 2A RLY	6ES7522-5HF00-0AB0 SIPLUS S7-1500 DQ 8X230VAC/5A ST (RELAY)	6ES7522-5FF00-0AB0 SIPLUS S7-1500 DQ 8X230VAC/2A ST (TRIAC)	6ES7522-5FH00-0AB0 SIPLUS S7-1500 16DQ 230VAC 1A ST TRIAC
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. 8 outputs (no adjacent points)	60 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 8x 0.25 A, max. total current 2 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. 4 A aggregate current per module, max. 0.25 A per output
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C	-25 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C	40 °C; = Tmax	40 °C; = Tmax	60 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

**SIMATIC S7-1500 Advanced Controllers**

I/O modules

SIPLUS digital modules

**SIPLUS SM 522 digital output modules****Technical specifications**

Article number	<b>6AG1522-5HH00-7AB0</b>	<b>6AG1522-5HF00-2AB0</b>	<b>6AG1522-5FF00-7AB0</b>	<b>6AG1522-5FH00-7AB0</b>
Based on	<b>6ES7522-5HH00-0AB0</b> SIPLUS S7-1500 16DQ 230VAC 2A RLY	<b>6ES7522-5HF00-0AB0</b> SIPLUS S7-1500 DQ 8X230VAC/5A ST (RELAY)	<b>6ES7522-5FF00-0AB0</b> SIPLUS S7-1500 DQ 8X230VAC/2A ST (TRIAC)	<b>6ES7522-5FH00-0AB0</b> SIPLUS S7-1500 16DQ 230VAC 1A ST TRIAC
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Overview



- 4, 8 or 16-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

## Ordering data

## SM 531 analog input modules

4 x U/I/RTD/TC  
4 analog inputs,  $\pm 10\text{ V}$ ,  $\pm 5\text{ V}$ ,  $\pm 2.5\text{ V}$ ,  
 $\pm 1\text{ V}$ ,  $\pm 500\text{ mV}$ ,  $\pm 250\text{ mV}$ ,  $\pm 80\text{ mV}$ ,  
 $\pm 50\text{ mV}$ , 1 ... 5 V,  
0/4 ... 20 mA,  $\pm 20\text{ mA}$ ,  
thermocouples  
type B, E, J, K, N, R, S, T,  
resistance thermometers Ni 100,  
Ni 1000, LG-Ni 1000, Pt100,  
Pt1000, Pt250, Pt500,  
resistors  
0 ... 150/300/600/6000 ohms;  
16 bits;  
incl. infeed element, shield bracket,  
shield terminal, labeling strips,  
U connector, printed front door

## Article No.

6ES7531-7QD00-0AB0

8 x U/I/R/RTD/  
8 analog inputs  $\pm 1\text{ V}$ ,  $\pm 10\text{ V}$ ,  
 $\pm 5\text{ V}$ ,  $\pm 50\text{ mV}$ ,  $\pm 500\text{ mV}$ , 1 ... 5 V,  
0/4 ... 20 mA,  $\pm 20\text{ mA}$ ,  
resistance thermometers  
Ni 100, Ni 1000, LG-Ni 1000,  
Pt100, Pt1000,  
resistors  
0 ... 600/6000 ohms, PTC;  
16 bits;  
incl. infeed element, shield bracket,  
shield terminal, labeling strips,  
U connector, printed front door

6ES7531-7QF00-0AB0

8 x U/I HS  
8 analog inputs,  $\pm 10\text{ V}$ ,  $\pm 5\text{ V}$ ,  
1 ... 5 V or 0/4 ... 20 mA,  $\pm 20\text{ mA}$ ,  
16 bits + sign;  
incl. infeed element, shield bracket,  
shield terminal, labeling strips,  
U connector, printed front door

6ES7531-7NF10-0AB0

8 x U/I/RTD/TC  
8 analog inputs  $\pm 10\text{ V}$ ,  $\pm 5\text{ V}$ ,  
 $\pm 2.5\text{ V}$ ,  $\pm 1\text{ V}$ ,  $\pm 500\text{ mV}$ ,  $\pm 250\text{ mV}$ ,  
 $\pm 80\text{ mV}$ ,  $\pm 50\text{ mV}$ , 1 ... 5 V,  
0/4 ... 20 mA,  $\pm 20\text{ mA}$ ,  
thermocouples  
type B, E, J, K, N, R, S, T,  
resistance thermometers  
Ni 100, Ni 1000, LG-Ni 1000,  
Pt100, Pt1000, Pt250, Pt500,  
resistors  
0 ... 150/300/600/6000 ohms;  
16 bits;  
incl. infeed element, shield bracket,  
shield terminal, labeling strips,  
U connector, printed front door

6ES7531-7KF00-0AB0

## 8 x U/I HF

8 analog inputs,  $\pm 10\text{ V}$ ,  $\pm 5\text{ V}$ ,  
1 ... 5 V or 0/4 ... 20 mA,  $\pm 20\text{ mA}$ ,  
16 bits + sign;  
incl. infeed element, shield bracket,  
shield terminal, labeling strips,  
U connector, printed front door

## Article No.

6ES7531-7NF00-0AB0

## 8 x U/R/RTD/TC

8 analog inputs,  $\pm 1\text{ V}$ ,  
 $\pm 500\text{ mV}$ ,  $\pm 250\text{ mV}$ ,  $\pm 80\text{ mV}$ ,  
 $\pm 50\text{ mV}$ ,  $\pm 25\text{ mV}$ ;  
thermocouples  
type B, E, J, K, N, R, S, T,  
TXK/TXK(L)  
according to GOST;  
resistance thermometers  
Cu 10, Cu 50, Cu 100, Ni 10,  
Ni 100, Ni 120, Ni 200, Ni 500,  
Ni 1000, LG-Ni 1000, Pt10, Pt50,  
Pt100, Pt200, Pt500, Pt1000;  
resistors  
0...150/300/600/6000 ohms, PTC;  
16 bits;  
incl. infeed element, shield bracket,  
shield terminal, labeling strips,  
U connector, printed front door

6ES7531-7PF00-0AB0

## 16 x U BA

16 analog inputs 1 ... 5 V,  $\pm 1\text{ V}$ ,  
 $\pm 5\text{ V}$ ,  $\pm 10\text{ V}$ ,  
16-bit resolution, accuracy 0.5%,  
16 channels in groups of 16,  
4 V DC common mode voltage,  
diagnostics, hardware interrupts;  
delivery including infeed element,  
shield bracket and shield terminal:  
Order front connectors (screw  
terminals or push-in) separately

6ES7531-7LH00-0AB0

## 16 x I BA

16 analog inputs 0/4 ... 20 mA,  
 $\pm 20\text{ mA}$ ,  
16-bit resolution, accuracy 0.5%,  
16 channels in groups of 16,  
4 V DC common mode voltage,  
diagnostics, hardware interrupts;  
delivery including infeed element,  
shield bracket and shield terminal:  
Order front connectors (screw  
terminals or push-in) separately

6ES7531-7MH00-0AB0

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 531 analog input modules

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Ordering data	Article No.	Ordering data	Article No.
<b>Accessories</b>		<b>Shielding set I/O</b>	
<b>Front connectors</b>		For 35 mm modules; infeed element, shield bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module).	<b>6ES7590-5CA00-0AA0</b>
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin		For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).	<b>6ES7590-5CA10-0XA0</b>
• Screw terminals	<b>6ES7592-1AM00-0XB0</b>		
• Push-in	<b>6ES7592-1BM00-0XB0</b>	<b>Shield terminal element</b>	<b>6ES7590-5BA00-0AA0</b>
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	<b>6ES7592-1BM00-0XA0</b>	10 units; spare part	
<b>DIN A4 labeling sheets</b>		<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, AI gray	<b>6ES7592-2AX00-0AA0</b>	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, AI gray	<b>6ES7592-1AX00-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
<b>U connector</b>	<b>6ES7590-0AA00-0AA0</b>	Current Manual Collection DVD and the three subsequent updates	
5 units; spare part			
<b>Universal front door for I/O modules</b>			
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	<b>6ES7528-0AA00-7AA0</b>		
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	<b>6ES7528-0AA00-0AA0</b>		

## Technical specifications

Article number	<b>6ES7531-7QD00-0AB0</b>	<b>6ES7531-7QF00-0AB0</b>	<b>6ES7531-7KF00-0AB0</b>	<b>6ES7531-7NF10-0AB0</b>	<b>6ES7531-7NF00-0AB0</b>
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/R/RTD BA	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
<b>General information</b>					
Product type designation	AI 4xU/I/RTD/TC ST	AI 8xU/I/R/RTD BA	AI 8xU/I/RTD/TC ST	AI 8xU/I HS	AI 8xU/I HF
<b>Product function</b>					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	No	Yes	No
• Prioritized startup	No	No	No	Yes	Yes
• Measuring range scalable	No	No	No	No	No
• Scalable measured values	No	No	No	No	Yes
• Adjustment of measuring range	No	No	No	No	Yes
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13.0.2	V15.1 / V16	V12 / V12	V14 / -	V14 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>					
• Oversampling	No	No	No	Yes	No
• MSI	Yes	Yes	Yes	Yes	Yes

## Technical specifications

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4xU/I/RTD/TC ST	6ES7531-7QF00-0AB0 S7-1500, AI 8xU/I/R/RTD BA	6ES7531-7KF00-0AB0 S7-1500, AI 8xU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8xU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8xU/I HF
<b>Supply voltage</b>					
Rated value (DC)	24 V		24 V	24 V	24 V
Reverse polarity protection	Yes		Yes	Yes	Yes
<b>Analog inputs</b>					
Number of analog inputs	4	8	8	8	8
• For current measurement	4	8	8	8	8
• For voltage measurement	4	8	8	8	8
• For resistance/resistance thermometer measurement	2	8	4		
• For thermocouple measurement	4		8		
permissible input voltage for voltage input (destruction limit), max.	28.8 V	12 V; 12 V continuous, 30 V for max. 1 s	28.8 V	28.8 V	28.8 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA	40 mA
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA	230 ... 370 µA	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA		
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K		
Analog input with oversampling	No				
Standardization of measured values	No				
<b>Input ranges (rated values), voltages</b>					
• 0 to +5 V	No	No	No	No	No
• 0 to +10 V	No	No	No	No	No
• 1 V to 5 V	Yes	Yes	Yes	Yes	Yes
• -1 V to +1 V	Yes	Yes	Yes		
• -10 V to +10 V	Yes	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	No	Yes	No	Yes
• -25 mV to +25 mV	No	No	No	No	No
• -250 mV to +250 mV	Yes	No	Yes	No	No
• -5 V to +5 V	Yes	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	Yes	Yes	Yes	No	No
• -500 mV to +500 mV	Yes	Yes	Yes	No	No
• -80 mV to +80 mV	Yes	No	Yes	No	No
<b>Input ranges (rated values), currents</b>					
• 0 to 10 mA		No			
• 0 to 20 mA	Yes	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes	Yes
<b>Input ranges (rated values), thermocouples</b>					
• Type B	Yes	No	Yes	No	No
• Type C	No	No	No	No	No
• Type E	Yes	No	Yes	No	No
• Type J	Yes	No	Yes	No	No
• Type K	Yes	No	Yes	No	No
• Type L	No	No	No	No	No
• Type N	Yes	No	Yes	No	No
• Type R	Yes	No	Yes	No	No
• Type S	Yes	No	Yes	No	No
• Type T	Yes	No	Yes	No	No
• Type U	No	No			
• Type TXK/TXK(L) to GOST	No	No	No	No	No

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 531 analog input modules

### Technical specifications

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4xU/I/RTD/TC ST	6ES7531-7QF00-0AB0 S7-1500, AI 8xU/I/R/RTD BA	6ES7531-7KF00-0AB0 S7-1500, AI 8xU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8xU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8xU/I HF
<b>Input ranges (rated values), resistance thermometer</b>					
• Cu 10	No	No	No	No	No
• Cu 10 according to GOST	No	No	No	No	No
• Cu 50	No	No	No	No	No
• Cu 50 according to GOST	No	No	No	No	No
• Cu 100	No	No	No	No	No
• Cu 100 according to GOST	No	No	No	No	No
• Ni 10	No	No	No	No	No
• Ni 10 according to GOST	No	No	No	No	No
• Ni 100	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 100 according to GOST	No	No	No	No	No
• Ni 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 1000 according to GOST	No	No	No	No	No
• LG-Ni 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 120	No	No	No	No	No
• Ni 120 according to GOST	No	No	No	No	No
• Ni 200	No	No	No	No	No
• Ni 200 according to GOST	No	No	No	No	No
• Ni 500	No	No	No	No	No
• Ni 500 according to GOST	No	No	No	No	No
• Pt 10	No	No	No	No	No
• Pt 10 according to GOST	No	No	No	No	No
• Pt 50	No	No	No	No	No
• Pt 50 according to GOST	No	No	No	No	No
• Pt 100	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 100 according to GOST	No	No	No	No	No
• Pt 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 1000 according to GOST	No	No	No	No	No
• Pt 200	Yes; Standard/climate	No	Yes; Standard/climate	No	No
• Pt 200 according to GOST	No	No	No	No	No
• Pt 500	Yes; Standard/climate	No	Yes; Standard/climate	No	No
• Pt 500 according to GOST	No	No	No	No	No
<b>Input ranges (rated values), resistors</b>					
• 0 to 150 ohms	Yes	No	Yes	No	No
• 0 to 300 ohms	Yes	No	Yes	No	No
• 0 to 600 ohms	Yes	Yes	Yes	No	No
• 0 to 3000 ohms	No	No	No	No	No
• 0 to 6000 ohms	Yes	Yes	Yes	No	No
• PTC	Yes	Yes	Yes	No	No
<b>Thermocouple (TC)</b>					
<b>Temperature compensation</b>					
- parameterizable	Yes		Yes		
<b>Cable length</b>					
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC	200 m; 50 m at 50 mV	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m	800 m



## Technical specifications

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4xU/I/RTD/TC ST	6ES7531-7QF00-0AB0 S7-1500, AI 8xU/I/R/RTD BA	6ES7531-7KF00-0AB0 S7-1500, AI 8xU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8xU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8xU/I HF
<b>Analog value generation for the inputs</b>					
<b>Integration and conversion time/resolution per channel</b>					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	24 bit; When using the function "Scaling of the measured values" or "Measuring range adaptation" (32 bit REAL format); 16 bit when using the S7 format (16 bit INTEGER)
• Integration time, parameterizable	Yes	Yes	Yes		Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms		Fast mode: 2,5 / 16,67 / 20 / 100 ms, standard mode: 7,5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms	10 / 24 / 27 / 107 ms	9 / 23 / 27 / 107 ms		Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
- additional conversion time for wire-break monitoring	9 ms (to be considered in R/RTD/TC measurement)	4 ms (to be considered in R/RTD/U 1 to 5 V measurement)	9 ms (to be considered in R/RTD/TC measurement)		
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms	8 ms	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms		
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz		400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)					Corresponds to the channel with the highest basic conversion time
• Basic execution time of the module (all channels released)				62.5 µs; independent of number of activated channels	
<b>Smoothing of measured values</b>					
• parameterizable	Yes	Yes	Yes	Yes	Yes
<b>Encoder</b>					
<b>Connection of signal encoders</b>					
• for voltage measurement	Yes	Yes	Yes	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes; with external supply	Yes	Yes	Yes; with external transmitter supply
- Burden of 2-wire transmitter, max.	820 Ω		820 Ω	820 Ω	
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC	Yes; Only for PTC	Yes; Only for PTC	No	No
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	No	No
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC		Yes; All measuring ranges except PTC	No	No

## SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 531 analog input modules

## Technical specifications

Article number	6ES7531-7QD00-0AB0	6ES7531-7QF00-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF10-0AB0	6ES7531-7NF00-0AB0
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/R/RTD BA	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
<b>Errors/accuracies</b>					
<b>Basic error limit (operational limit at 25 °C)</b>					
• Voltage, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %	0.2 %	0.05 %
• Current, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %	0.2 %	0.05 %
• Resistance, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %		
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Pbxxx standard: ±0.7 K, Pbxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K	Pbxxx Standard: ±1.0 K, Pbxxx Climate: ±0.5 K, Nixxx Standard: ±0.5 K, Nixxx Climate: ±0.5 K	Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K		
• Thermocouple, relative to input range, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K		Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K		
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>					
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB	40 dB		80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	10 V	4 V	10 V	10 V	60 V DC/30 V AC
• Common mode interference, min.	60 dB	60 dB	60 dB	50 dB at 400 Hz; 60 dB at 60 / 50 / 10 Hz	80 dB
<b>Isochronous mode</b>					
Filtering and processing time (TCI), min.				80 µs	
Bus cycle time (TDP), min.				250 µs	
<b>Interrupts/diagnostics/status information</b>					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>					
• Monitoring the supply voltage	Yes	No	Yes	Yes	Yes
• Wire-break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; Only for 1 ... 5 V, 4 ... 20 mA, R, and RTD	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; only for 1 ... 5 V and 4 ... 20 mA	Yes; only for 1 ... 5 V and 4 ... 20 mA
• Short-circuit		No			
• Group error		No			
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>					
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED		No			
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	No	Yes; green LED	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED

## Technical specifications

Article number	6ES7531-7QD00-0AB0	6ES7531-7QF00-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF10-0AB0	6ES7531-7NF00-0AB0
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/R/RTD BA	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
<b>Potential separation</b>					
<b>Potential separation channels</b>					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262		
Suitable for applications according to CQI-9			Yes; Based on AMS 2750 E		
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	0 °C	0 °C	0 °C	-25 °C; From FS02	-30 °C; From FS02
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	-25 °C; From FS02	-30 °C; From FS02
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>					
Width	25 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>					
Weight, approx.	210 g	250 g	310 g	300 g	280 g
<b>Other</b>					
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermoelement: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K		Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 ohms ±0.02%; resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermocouple: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K		

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 531 analog input modules

### Technical specifications

Article number	<b>6ES7531-7LH00-0AB0</b> S7-1500, AI 16xU BA	<b>6ES7531-7MH00-0AB0</b> S7-1500, AI 16xI BA
<b>General information</b>		
Product type designation	AI 16xU BA	AI 16xI BA
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
• Prioritized startup	No	No
• Measuring range scalable	No	No
• Scalable measured values	No	No
• Adjustment of measuring range	No	No
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 312 / V17	V16 with HSP 312 / V17
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -
<b>Operating mode</b>		
• Oversampling	No	No
• MSI	Yes	Yes
<b>Analog inputs</b>		
Number of analog inputs	16	16
• For current measurement		16
• For voltage measurement	16	
permissible input voltage for voltage input (destruction limit), max.	12 V; 12 V continuous, 30 V for max. 1 s	
permissible input current for current input (destruction limit), max.		40 mA
<b>Input ranges (rated values), voltages</b>		
• 0 to +5 V	No	
• 0 to +10 V	No	
• 1 V to 5 V	Yes	
• -1 V to +1 V	Yes	
• -10 V to +10 V	Yes	
• -2.5 V to +2.5 V	No	
• -25 mV to +25 mV	No	
• -250 mV to +250 mV	No	
• -5 V to +5 V	Yes	
• -50 mV to +50 mV	No	
• -500 mV to +500 mV	No	
• -80 mV to +80 mV	No	
<b>Input ranges (rated values), currents</b>		
• 0 to 10 mA		No
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes
<b>Cable length</b>		
• shielded, max.	200 m	800 m

## Technical specifications

Article number	6ES7531-7LH00-0AB0 S7-1500, AI 16xU BA	6ES7531-7MH00-0AB0 S7-1500, AI 16xI BA
<b>Analog value generation for the inputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes
• Basic conversion time, including integration time (ms)	10 / 24 / 27 / 107 ms	10 / 24 / 27 / 107 ms
- additional conversion time for wire-break monitoring	4 ms (to be considered for 1 to 5 V measurement)	
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz
<b>Smoothing of measured values</b>		
• parameterizable	Yes	Yes
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	No
• for current measurement as 2-wire transducer		Yes; with external supply
• for current measurement as 4-wire transducer		Yes
• for resistance measurement with two-wire connection		No
• for resistance measurement with three-wire connection		No
• for resistance measurement with four-wire connection		No
<b>Errors/accuracies</b>		
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input range, (+/-)	0.3 %	
• Current, relative to input range, (+/-)		0.3 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• Common mode voltage, max.	4 V	4 V
• Common mode interference, min.	60 dB	60 dB
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>		
• Monitoring the supply voltage	No	No
• Wire-break	Yes; Only for 1 ... 5 V	Yes; Only for 4 ... 20 mA
• Short-circuit	No	No
• Group error	No	No
• Overflow/underflow	Yes	Yes
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	No	No
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 531 analog input modules

### Technical specifications

Article number	6ES7531-7LH00-0AB0 S7-1500, AI 16xU BA	6ES7531-7MH00-0AB0 S7-1500, AI 16xI BA
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	250 g	250 g

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF
<b>General information</b>	
Product type designation	AI 8xU/R/RTD/TC HF
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Prioritized startup	Yes
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	V14 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -
<b>Operating mode</b>	
• Oversampling	No
• MSI	Yes
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Analog inputs</b>	
Number of analog inputs	8; Plus one additional RTD (reference) channel
• For voltage measurement	8; Plus one additional RTD (reference) channel
• For resistance/resistance thermometer measurement	8; Plus one additional RTD (reference) channel
• For thermocouple measurement	8; Plus one additional RTD (reference) channel
permissible input voltage for voltage input (destruction limit), max.	20 V

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Cu10, Cu50, Cu100, Ni10, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100, Pt200 climate: 1 mA; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt200 standard, Pt500, Pt1000, PTC: 0.25 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
<b>Input ranges (rated values), voltages</b>	
• 0 to +5 V	No
• 0 to +10 V	No
• 1 V to 5 V	No
• -1 V to +1 V	Yes
• -10 V to +10 V	No
• -2.5 V to +2.5 V	No
• -25 mV to +25 mV	Yes
• -250 mV to +250 mV	Yes
• -5 V to +5 V	No
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	No
• -20 mA to +20 mA	No
• 4 mA to 20 mA	No
<b>Input ranges (rated values), thermocouples</b>	
• Type B	Yes
• Type C	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	No
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type TXK/TXK(L) to GOST	Yes

### Technical specifications

Article number	<b>6ES7531-7PF00-0AB0</b> S7-1500, AI 8 X U/R/RTD/TC HF
<b>Input ranges (rated values), resistance thermometer</b>	
• Cu 10	Yes; Standard/climate
• Cu 10 according to GOST	Yes; Standard/climate
• Cu 50	Yes; Standard/climate
• Cu 50 according to GOST	Yes; Standard/climate
• Cu 100	Yes; Standard/climate
• Cu 100 according to GOST	Yes; Standard/climate
• Ni 10	Yes; Standard/climate
• Ni 10 according to GOST	Yes; Standard/climate
• Ni 100	Yes; Standard/climate
• Ni 100 according to GOST	Yes; Standard/climate
• Ni 1000	Yes; Standard/climate
• Ni 1000 according to GOST	Yes; Standard/climate
• LG-Ni 1000	Yes; Standard/climate
• Ni 120	Yes; Standard/climate
• Ni 120 according to GOST	Yes; Standard/climate
• Ni 200	Yes; Standard/climate
• Ni 200 according to GOST	Yes; Standard/climate
• Ni 500	Yes; Standard/climate
• Ni 500 according to GOST	Yes; Standard/climate
• Pt 10	Yes; Standard/climate
• Pt 10 according to GOST	Yes; Standard/climate
• Pt 50	Yes; Standard/climate
• Pt 50 according to GOST	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
• Pt 100 according to GOST	Yes; Standard/climate
• Pt 1000	Yes; Standard/climate
• Pt 1000 according to GOST	Yes; Standard/climate
• Pt 200	Yes; Standard/climate
• Pt 200 according to GOST	Yes; Standard/climate
• Pt 500	Yes; Standard/climate
• Pt 500 according to GOST	Yes; Standard/climate
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
• PTC	Yes
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
- parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	800 m; at U; 200 m at R/RTD/TC

Article number	<b>6ES7531-7PF00-0AB0</b> S7-1500, AI 8 X U/R/RTD/TC HF
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	21 bit; For measuring mode RTC and TC when using the function "Scalable temperature measuring range" (32 bit REAL format); 16 bit for measuring mode R and U; 16 bit for all measuring modes when using the S7 format (16 bit INTEGER)
• Integration time, parameterizable	Yes
• Integration time (ms)	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
- additional conversion time for wire-break monitoring	Thermocouples, 150 Ohm, 300 Ohm, 600 Ohm, Cu10, Cu50, Cu100, Ni10, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100: 4 ms; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt200, Pt500, Pt1000: 13 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)	Corresponds to the channel with the highest basic conversion time
<b>Smoothing of measured values</b>	
• parameterizable	Yes
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	No
• for current measurement as 4-wire transducer	No
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
<b>Errors/accuracies</b>	
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.05 %
• Resistance, relative to input range, (+/-)	0.05 %
• Resistance thermometer, relative to input range, (+/-)	Cuxxx Standard: ±0.3 K, Cuxxx Klima: ±0.2 K, Ptxxx Standard: ±0.5 K, Ptxxx Klima: ±0.2 K, Nixxx Standard: ±0.3 K, Nixxx Klima: ±0.15 K
• Thermocouple, relative to input range, (+/-)	Type B: > 600 °C ±1 K, Type E: > -200 °C ±0.5 K, Type J: > -210 °C ±0.5 K, Type K: > -200 °C ±1 K, Type N: > -200 °C ±1 K, Type R: > 0 °C ±1 K, Type S: > 0 °C ±1 K, Type T: > -200 °C ±0.5 K, Type C: ±2 K, Type TXK/TXK(L): ±0.5 K
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>	
• Series mode interference (peak value of interference < rated value of input range), min.	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	60 V DC/30 V AC
• Common mode interference, min.	80 dB

**SIMATIC S7-1500 Advanced Controllers**

I/O modules

Analog modules

**SM 531 analog input modules****Technical specifications**

Article number	<b>6ES7531-7PF00-0AB0</b> S7-1500, AI 8 X U/R/RTD/TC HF
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; Only with TC, R, RTD
• Overflow/underflow	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes

Article number	<b>6ES7531-7PF00-0AB0</b> S7-1500, AI 8 X U/R/RTD/TC HF
<b>Standards, approvals, certificates</b>	
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	290 g
<b>Other</b>	
Note:	for the R/RDT three-wire measurement, the conductor compensation is made alternating with the measurement; this then requires two module cycles for a measured value



## Overview



- 2, 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks

## Ordering data

## SM 532 analog output modules

## Module width 25 mm

2 x U/I ST; 2 analog outputs,  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  $\pm 20$  mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door

6ES7532-5NB00-0AB0

## Module width 35 mm

4 x U/I ST; 4 analog outputs,  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  $\pm 20$  mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door

6ES7532-5HD00-0AB0

8 x U/I HF; 8 analog outputs,  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  $\pm 20$  mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door

6ES7532-5HF00-0AB0

4 x U/I HF; 4 analog outputs,  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  $\pm 20$  mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door

6ES7532-5ND00-0AB0

## Accessories

## Front connectors

For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin

- Screw terminals
- Push-in

6ES7592-1AM00-0XB0

6ES7592-1BM00-0XB0

For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part

6ES7592-1BM00-0XA0

## DIN A4 labeling sheets

For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray

6ES7592-2AX00-0AA0

For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray

6ES7592-1AX00-0AA0

## U connector

5 units; spare part

6ES7590-0AA00-0AA0

## Universal front door for I/O modules

For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part

6ES7528-0AA00-7AA0

For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part

6ES7528-0AA00-0AA0

## Shielding set I/O

For 35 mm modules; infeed element, shield bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module).

6ES7590-5CA00-0AA0

For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).

6ES7590-5CA10-0XA0

## Shield terminal element

10 units; spare part

6ES7590-5BA00-0AA0

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# SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 532 analog output modules

### Technical specifications

Article number	6ES7532-5NB00-0AB0 S7-1500, AQ 2xU/I ST	6ES7532-5HD00-0AB0 S7-1500, AQ 4xU/I ST	6ES7532-5HF00-0AB0 S7-1500, AQ 8xU/I HS	6ES7532-5ND00-0AB0 S7-1500, AQ 4xU/I HF
<b>General information</b>				
Product type designation	AQ 2xU/I ST	AQ 4xU/I ST	AQ 8xU/I HS	AQ 4xU/I HF
<b>Product function</b>				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	Yes	Yes
• Prioritized startup	No	No	No	Yes
• Output range scalable	No	No	No	
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13.0.2	V12 / V12	V14 / -	V14 / -
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>				
• Oversampling	No	No	Yes	No
• MSO	Yes	Yes	Yes	Yes
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
<b>Analog outputs</b>				
Number of analog outputs	2	4	8	4
Cycle time (all channels), min.	3.2 ms; independent of number of activated channels	3.2 ms; independent of number of activated channels	125 µs; independent of number of activated channels	125 µs; independent of number of activated channels
<b>Output ranges, voltage</b>				
• 0 to 10 V	Yes	Yes	Yes	Yes
• 1 V to 5 V	Yes	Yes	Yes	Yes
• -5 V to +5 V	No	No	No	No
• -10 V to +10 V	Yes	Yes	Yes	Yes
<b>Output ranges, current</b>				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes
<b>Connection of actuators</b>				
• for voltage output two-wire connection	Yes	Yes	Yes	Yes
• for voltage output four-wire connection	Yes	Yes	Yes	Yes
• for current output two-wire connection	Yes	Yes	Yes	Yes
<b>Load impedance (in rated range of output)</b>				
• with voltage outputs, min.	1 kΩ; 0.5 kΩhm at 1 to 5 V	1 kΩ; 0.5 kΩhm at 1 to 5 V	1 kΩ	1 kΩ; 0.5 kΩhm at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 µF	1 µF	100 nF	1 µF
• with current outputs, max.	750 Ω	750 Ω	500 Ω	750 Ω
• with current outputs, inductive load, max.	10 mH	10 mH	1 mH	10 mH
<b>Cable length</b>				
• shielded, max.	800 m; for current, 200 m for voltage	800 m; for current, 200 m for voltage	200 m	800 m; for current, 200 m for voltage

## Technical specifications

Article number	6ES7532-5NB00-0AB0 S7-1500, AQ 2xU/I ST	6ES7532-5HD00-0AB0 S7-1500, AQ 4xU/I ST	6ES7532-5HF00-0AB0 S7-1500, AQ 8xU/I HS	6ES7532-5ND00-0AB0 S7-1500, AQ 4xU/I HF
<b>Analog value generation for the outputs</b>				
<b>Integration and conversion time/resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit
• Conversion time (per channel)	0.5 ms	0.5 ms	50 µs; independent of number of activated channels	125 µs; independent of number of activated channels
<b>Settling time</b>				
• for resistive load	1.5 ms	1.5 ms	30 µs; see additional description in the manual	0.2 ms; see additional description in the manual
• for capacitive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual	1.8 ms; see additional description in the manual
• for inductive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual	2 ms; see additional description in the manual
<b>Errors/accuracies</b>				
<b>Basic error limit (operational limit at 25 °C)</b>				
• Voltage, relative to output range, (+/-)	0.2 %	0.2 %	0.2 %	0.06 %
• Current, relative to output range, (+/-)	0.2 %	0.2 %	0.2 %	0.1 %
<b>Isochronous mode</b>				
Execution and activation time (TCO), min.			100 µs	100 µs
Bus cycle time (TDP), min.			250 µs	250 µs
<b>Interrupts/diagnostics/status information</b>				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	Yes
<b>Diagnoses</b>				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes; Only for output type "current"
• Short-circuit	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"
• Overflow/underflow	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
<b>Potential separation</b>				
<b>Potential separation channels</b>				
• between the channels and backplane bus	Yes	Yes	Yes	Yes

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 532 analog output modules

### Technical specifications

Article number	6ES7532-5NB00-0AB0 S7-1500, AQ 2xU/I ST	6ES7532-5HD00-0AB0 S7-1500, AQ 4xU/I ST	6ES7532-5HF00-0AB0 S7-1500, AQ 8xU/I HS	6ES7532-5ND00-0AB0 S7-1500, AQ 4xU/I HF
<b>Standards, approvals, certificates</b>				
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS05	Yes; from FS04	Yes; From FS03
<b>Highest safety class achievable for safety-related tripping of standard modules</b>				
<ul style="list-style-type: none"> <li>Performance level according to ISO 13849-1</li> <li>Category according to ISO 13849-1</li> <li>SILCL according to IEC 62061</li> </ul>	PL d Cat. 3 SILCL 2	PL d Cat. 3 SILCL 2	PL d Cat. 3 SILCL 2	PL d Cat. 3 SILCL 2
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>		-30 °C; From FS06 60 °C -30 °C; From FS06 40 °C	-30 °C; From FS03 60 °C -30 °C; From FS03 40 °C	-25 °C; From FS02 60 °C -25 °C; From FS02 40 °C
<b>Altitude during operation relating to sea level</b>				
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	
<b>Dimensions</b>				
Width	25 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>				
Weight, approx.	200 g	310 g	325 g	300 g
<b>Other</b>				
Note:	Supplied incl. 40-pole push-in front connectors			

## Overview



- 4 analog inputs/ 2 analog outputs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces

## Ordering data

**SM 534 analog input/output module**

Module width 25 mm

4 analog inputs  
 $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V,  $\pm 1$  V,  $\pm 500$  mV,  
 $\pm 250$  mV,  $\pm 80$  mV,  $\pm 50$  mV, 1 ... 5 V,  
 0/4 ... 20 mA,  $\pm 20$  mA,  
 thermocouples  
 type B, E, J, K, N, R, S, T,  
 resistance thermometers  
 Ni 100, Ni 1000, LG-Ni 1000,  
 Pt 100, Pt 1000, Pt 250, Pt 500,  
 resistors  
 0...150/300/600/6000 ohms,  
 16 bits;  
 2 analog outputs,  
 $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  
 $\pm 20$  mA, 0/4 ... 20 mA, 16 bits;  
 incl. infeed element, shield bracket,  
 shield terminal, labeling strips,  
 U connector, printed front door

**Accessories****Front connectors**

For 25 mm modules;  
 including cable ties and  
 individual labeling strips;  
 push-in terminal 40-pin;  
 spare part

**DIN A4 labeling sheets**

For 25 mm modules;  
 10 sheets with 20 labeling  
 strips each for I/O modules;  
 perforated, Al gray

**U connector**

5 units; spare part

## Article No.

6ES7534-7QE00-0AB0

6ES7592-1BM00-0XA0

6ES7592-1AX00-0AA0

6ES7590-0AA00-0AA0

## Article No.

**Universal front door for I/O modules**

For 25 mm modules;  
 5 front doors; with 5 labeling  
 strips (front) and 5 cabling  
 diagrams per front door; spare part

**Shielding set I/O**

For 25 mm modules;  
 infeed element, shield bracket,  
 and shield terminal;  
 4 units, spare part (one shield  
 set supplied with the module).

**Shield terminal element**

10 units; spare part

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6ES7998-8XC01-8YE2

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 534 analog input/output modules

### Technical specifications

Article number	<b>6ES7534-7QE00-0AB0</b> S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
<b>General information</b>	
Product type designation	AI 4xU/I/RTD/TC /AQ 2xU/I ST
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Prioritized startup	No
• Measuring range scalable	No
• Scalable measured values	No
• Adjustment of measuring range	No
• Output range scalable	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13.0.2
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -
<b>Operating mode</b>	
• Oversampling	No
• MSI	Yes
• MSO	Yes
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Analog inputs</b>	
Number of analog inputs	4
• For current measurement	4
• For voltage measurement	4
• For resistance/resistance thermometer measurement	2
• For thermocouple measurement	4
permissible input voltage for voltage input (destruction limit), max.	28.8 V
permissible input current for current input (destruction limit), max.	40 mA
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Analog input with oversampling	No
Standardization of measured values	No
<b>Input ranges (rated values), voltages</b>	
• 0 to +5 V	No
• 0 to +10 V	No
• 1 V to 5 V	Yes
• -1 V to +1 V	Yes
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -25 mV to +25 mV	No
• -250 mV to +250 mV	Yes
• -5 V to +5 V	Yes
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes

Article number	<b>6ES7534-7QE00-0AB0</b> S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Input ranges (rated values), thermocouples</b>	
• Type B	Yes
• Type C	No
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	No
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type U	No
• Type TXK/TXK(L) to GOST	No
<b>Input ranges (rated values), resistance thermometer</b>	
• Cu 10	No
• Cu 10 according to GOST	No
• Cu 50	No
• Cu 50 according to GOST	No
• Cu 100	No
• Cu 100 according to GOST	No
• Ni 10	No
• Ni 10 according to GOST	No
• Ni 100	Yes; Standard/climate
• Ni 100 according to GOST	No
• Ni 1000	Yes; Standard/climate
• Ni 1000 according to GOST	No
• LG-Ni 1000	Yes; Standard/climate
• Ni 120	No
• Ni 120 according to GOST	No
• Ni 200	No
• Ni 200 according to GOST	No
• Ni 500	No
• Ni 500 according to GOST	No
• Pt 10	No
• Pt 10 according to GOST	No
• Pt 50	No
• Pt 50 according to GOST	No
• Pt 100	Yes; Standard/climate
• Pt 100 according to GOST	No
• Pt 1000	Yes; Standard/climate
• Pt 1000 according to GOST	No
• Pt 200	Yes; Standard/climate
• Pt 200 according to GOST	No
• Pt 500	Yes; Standard/climate
• Pt 500 according to GOST	No

## Technical specifications

Article number	<b>6ES7534-7QE00-0AB0</b> S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
• PTC	Yes
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
- parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC
<b>Analog outputs</b>	
Number of analog outputs	2
Cycle time (all channels), min.	3.2 ms; ±0.5 ms, regardless of the number of activated channels
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -5 V to +5 V	No
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Connection of actuators</b>	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 kΩ; 0.5 kΩhm at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
<b>Cable length</b>	
• shielded, max.	800 m; for current, 200 m for voltage

Article number	<b>6ES7534-7QE00-0AB0</b> S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms
- additional conversion time for wire-break monitoring	9 ms
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10
<b>Smoothing of measured values</b>	
• parameterizable	Yes
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Conversion time (per channel)	0.5 ms
<b>Settling time</b>	
• for resistive load	1.5 ms
• for capacitive load	2.5 ms
• for inductive load	2.5 ms
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	820 Ω
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

## SM 534 analog input/output modules

### Technical specifications

Article number	<b>6ES7534-7QE00-0AB0</b> S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
<b>Errors/accuracies</b>	
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K
• Thermocouple, relative to input range, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K
• Voltage, relative to output range, (+/-)	0.2 %
• Current, relative to output range, (+/-)	0.2 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode voltage, max.	10 V
• Common mode interference, min.	60 dB
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; only for input type 1 ... 5 V, 4 ... 20 mA, TC, R, RTD and output type current
• Short-circuit	Yes; Only for output type "voltage"
• Overflow/underflow	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED

Article number	<b>6ES7534-7QE00-0AB0</b> S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
<b>Potential separation</b>	
<b>Potential separation analog inputs</b>	
• between the channels and backplane bus	Yes
<b>Potential separation analog outputs</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>	
Width	25 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	250 g
<b>Other</b>	
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermoelement: type B, R, S: ±3 K, type E, J, K, N, T: ±1 K

4



## Overview



- 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

## Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS SM 531 analog input modules**

(Extended temperature range and exposure to media)

8 analog inputs,  
±10 V, ±5 V, 1 ... 5 V or  
0/4 ... 20 mA, ±20 mA,  
16-bit + sign; incl. infeed element,  
shielding bracket, shield terminal,  
labeling strips, U connector,  
printed front door

**6AG1531-7NF10-7AB0**

8 analog inputs  
±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV,  
±250 mV, ±80 mV, ±50 mV, 1 ... 5 V,  
0/4 ... 20 mA, ±20 mA,  
thermocouples  
type B, E, J, K, N, R, S, T,  
resistance thermometers  
Ni 100, Ni 1000, LG-Ni 1000,  
Pt 100, Pt 1000, Pt 250, Pt 500,  
resistors  
0...150/300/600/6000 ohms, 16-bit

**6AG1531-7KF00-7AB0**

8 analog inputs,  
±10 V, ±5 V, 1 ... 5 V or  
0/4 ... 20 mA, ±20 mA,  
16-bit + sign; including infeed  
element, shielding bracket,  
shield terminal, labeling strips,  
U connector, printed front door

**6AG1531-7NF00-7AB0**

8 analog inputs,  
±1 V, ±500 mV, ±250 mV, ±80 mV,  
±50 mV, ±25 mV;  
thermocouples  
type B, E, J, K, N, R, S, T,  
TXK/TXK(L) according to GOST;  
resistance thermometers  
Cu 10, Cu 50, Cu 100, Ni 10,  
Ni 100, Ni 120, Ni 200, Ni 500,  
Ni 1000, LG-Ni 1000, Pt10, Pt50,  
Pt100, Pt200, Pt500, Pt1000;  
resistors  
0...150/300/600/6 000 ohms,  
PTC; 16-bit; incl. infeed element,  
shield bracket, shield terminal,  
labeling strips, U connector,  
printed front door

**6AG1531-7PF00-4AB0****Accessories**

See SIMATIC S7-1500 SM 531 analog input modules, page 4/116

## Technical specifications

Article number	<b>6AG1531-7NF10-7AB0</b>	<b>6AG1531-7KF00-7AB0</b>	<b>6AG1531-7NF00-7AB0</b>	<b>6AG1531-7PF00-4AB0</b>
Based on	<b>6ES7531-7NF10-0AB0</b>	<b>6ES7531-7KF00-0AB0</b>	<b>6ES7531-7NF00-0AB0</b>	<b>6ES7531-7PF00-0AB0</b>
	SIPLUS S7-1500 AI 8xU/I HS	SIPLUS S7-1500 AI 8xU/I/RTD/TC ST	SIPLUS S7-1500 AI 8xU/I HF	SIPLUS S7-1500 AI 8xU/R/RTD/TC HF
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	0 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

# SIMATIC S7-1500 Advanced Controllers

I/O modules

SIPLUS analog modules

## SIPLUS SM 531 analog input modules

### Technical specifications

Article number	6AG1531-7NF10-7AB0	6AG1531-7KF00-7AB0	6AG1531-7NF00-7AB0	6AG1531-7PF00-4AB0
Based on	6ES7531-7NF10-0AB0 SIPLUS S7-1500 AI 8xU/I HS	6ES7531-7KF00-0AB0 SIPLUS S7-1500 AI 8xU/I/RTD/TC ST	6ES7531-7NF00-0AB0 SIPLUS S7-1500 AI 8xU/I HF	6ES7531-7PF00-0AB0 SIPLUS S7-1500 AI 8xU/R/RTD/TC HF
<b>Relative humidity</b>				
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Overview



- 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks

## Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS SM 532 analog output modules**

(Extended temperature range and exposure to media)

4 analog outputs,  
±10 V, 1 ... 5 V, 0 ... 10 V or  
±20 mA, 0/4 ... 20 mA, 16-bit

**6AG1532-5HD00-7AB0**

8 analog outputs,  
±10 V, 1 ... 5 V, 0 ... 10 V or  
±20 mA, 0/4 ... 20 mA, 16-bit;  
incl. infeed element, shield clamp,  
shield terminal, labeling strips,  
U connector, printed front door

**6AG1532-5HF00-7AB0****Accessories**

See SIMATIC S7-1500  
SM 532 analog output modules,  
page 4/127

## Technical specifications

Article number	<b>6AG1532-5HD00-7AB0</b>	<b>6AG1532-5HF00-7AB0</b>
Based on	<b>6ES7532-5HD00-0AB0</b> SIPLUS S7-1500 AQ 4xU/I ST	<b>6ES7532-5HF00-0AB0</b> SIPLUS S7-1500 AQ 8xU/I HS
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. 4x ±10 V permissible
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

# SIMATIC S7-1500 Advanced Controllers

I/O modules

SIPLUS analog modules

## SIPLUS SM 532 analog output modules

### Technical specifications

Article number	6AG1532-5HD00-7AB0	6AG1532-5HF00-7AB0
Based on	6ES7532-5HD00-0AB0 SIPLUS S7-1500 AQ 4xU/I ST	6ES7532-5HF00-0AB0 SIPLUS S7-1500 AQ 8xU/I HS
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Overview



- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>TM Count 2x24V counter module</b> With 2 channels, max. 200 kHz; for 24 V encoder	<b>6ES7550-1AA01-0AB0</b>	<b>Shielding set I/O</b> Infeed element, shield clamp, and shield terminal; 5 units, spare part	<b>6ES7590-5CA00-0AA0</b>
<b>Accessories</b>		<b>Shield terminal element</b> 10 units; spare part	<b>6ES7590-5BA00-0AA0</b>
<b>Front connector</b> For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin • Screw terminals • Push-in	<b>6ES7592-1AM00-0XB0</b> <b>6ES7592-1BM00-0XB0</b>	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>DIN A4 labeling sheets</b> 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	<b>6ES7592-2AX00-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>U connector</b> 5 units; spare part	<b>6ES7590-0AA00-0AA0</b>		
<b>Universal front door for I/O modules</b> 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	<b>6ES7528-0AA00-7AA0</b>		

## Technical specifications

Article number	<b>6ES7550-1AA01-0AB0</b> S7-1500, TM Count 2x24V	Article number	<b>6ES7550-1AA01-0AB0</b> S7-1500, TM Count 2x24V
<b>General information</b>		<b>Installation type/mounting</b>	
Product type designation	TM Count 2x24V	Rail mounting	Yes; S7-1500 mounting rail
<b>Product function</b>		<b>Supply voltage</b>	
• I&M data	Yes; I&M0 to I&M3	<b>Load voltage L+</b>	
• Isochronous mode	Yes	• Rated value (DC)	24 V
<b>Engineering with</b>		• Reverse polarity protection	Yes
• STEP 7 TIA Portal configurable/integrated from version	V16 with HSP 0332 / V17	<b>Encoder supply</b>	
• PROFIBUS from GSD version/GSD revision	GSD Revision 5	Number of outputs	1; A common 24V encoder supply for both channels
• PROFINET from GSD version/GSD revision	V2.3 / -	<b>24 V encoder supply</b>	
		• 24 V	Yes; L+ (-0.8 V)
		• Short-circuit protection	Yes
		• Output current, max.	1 A; total current of all encoders/channels

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Technology modules

## TM Count 2x24V counter module

### Technical specifications

Article number	<b>6ES7550-1AA01-0AB0</b> S7-1500, TM Count 2x24V
<b>Digital inputs</b>	
Number of digital inputs	6; 3 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
<b>for technological functions</b>	
- parameterizable	Yes
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs

Article number	<b>6ES7550-1AA01-0AB0</b> S7-1500, TM Count 2x24V
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per module, max.	2 A
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
<b>Encoder signal 24 V</b>	
- permissible voltage at input, min.	-30 V
- permissible voltage at input, max.	30 V
<b>Interface types</b>	
• Source/sink input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED

## Technical specifications

Article number	<b>6ES7550-1AA01-0AB0</b> S7-1500, TM Count 2x24V
<b>Integrated Functions</b>	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
<b>Counting functions</b>	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
• Suitable for Simotion	Yes
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	<b>6ES7550-1AA01-0AB0</b> S7-1500, TM Count 2x24V
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	250 g

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Technology modules

## TM PosInput 2 counter and position detection module

### Overview



- 2-channel counter and position detection module with RS 422 interface
- Extensive parameterization options for optimum task-specific adaptation
- Reduces load on controller due to preprocessing on the module
- Position detection with incremental and SSI absolute encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS 422 signals or 5V-TTL signals

### Ordering data

#### TM PosInput 2 counter and position detection module

With 2-channels, max. 1 MHz counting frequency; for SSI encoders and incremental encoders with RS 422 or 5V TTL interface

#### Accessories

##### Front connectors

For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin

- Screw terminals
- Push-in

##### DIN A4 labeling sheets

10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey

##### U connector

5 units; spare part

##### Universal front door for I/O modules

5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part

### Article No.

**6ES7551-1AB00-0AB0**

**6ES7592-1AM00-0XB0**

**6ES7592-1BM00-0XB0**

**6ES7592-2AX00-0AA0**

**6ES7590-0AA00-0AA0**

**6ES7528-0AA00-7AA0**

### Article No.

#### Shielding set I/O

Infeed element, shield bracket, and shield terminal; 5 units, spare part

#### Shield terminal element

10 units; spare part

#### SIMATIC Manual Collection

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

**6ES7590-5CA00-0AA0**

**6ES7590-5BA00-0AA0**

**6ES7998-8XC01-8YE0**

**6ES7998-8XC01-8YE2**

### Technical specifications

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM Posinput 2
<b>General information</b>	
Product type designation	TM PosInput 2
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	V12 (FW V1.0) ... V15 (FW V1.3)/ V12 (FW V1.0), V13 (FW V1.1)
• PROFIBUS from GSD version/ GSD revision	GSD Revision 5
• PROFINET from GSD version/ GSD revision	V2.3 / -

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM Posinput 2
<b>Installation type/mounting</b>	
Rail mounting	Yes; S7-1500 mounting rail
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	4; One 5V and 24V encoder supply per channel
<b>5 V encoder supply</b>	
• 5 V	Yes; 5.2 V ±2 %
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel



### Technical specifications

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM Posinput 2
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
<b>Digital inputs</b>	
Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
<b>for technological functions</b>	
- parameterizable	Yes
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM Posinput 2
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per module, max.	2 A
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
<b>Interface types</b>	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Technology modules

## TM Posinput 2 counter and position detection module

### Technical specifications

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM Posinput 2
<b>Isochronous mode</b>	
Filtering and processing time (TCI), min.	130 µs; only for pulse and incremental encoders
Bus cycle time (TDP), min.	250 µs
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
<b>Integrated Functions</b>	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	4 MHz; with quadruple evaluation
<b>Counting functions</b>	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM Posinput 2
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes; FW V1.1 and higher
to standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	325 g

## Overview



- 8 digital inputs, 16 digital outputs, of which up to 16 can be used in different configurations as technological, time-controlled channels
- Inputs for detecting the input edges with  $\mu\text{s}$  accuracy
- Outputs for outputting switching signals with  $\mu\text{s}$  accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed operation

## Ordering data

## Article No.

<b>Time-based IO module TM Timer DIDQ 16x24V</b>	<b>6ES7552-1AA00-0AB0</b>
Max. 16 time-controlled inputs or outputs	
<b>Accessories</b>	
<b>Front connector</b>	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	<b>6ES7592-1AM00-0XB0</b>
• Push-in	<b>6ES7592-1BM00-0XB0</b>
<b>DIN A4 labeling sheets</b>	<b>6ES7592-2AX00-0AA0</b>
10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	
<b>U connector</b>	<b>6ES7590-0AA00-0AA0</b>
5 units; spare part	
<b>Universal front door for I/O modules</b>	<b>6ES7528-0AA00-7AA0</b>
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	
<b>Shielding set I/O</b>	<b>6ES7590-5CA00-0AA0</b>
Infeed element, shield bracket, and shield terminal; 5 units, spare part:	
Note: Only shield bracket and shield terminal are required for the TM Timer DIDQ 16x24V	
<b>Shield terminal element</b>	<b>6ES7590-5BA00-0AA0</b>
10 units; spare part	
<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
Current "Manual Collection" DVD and the three subsequent updates	

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Technology modules

## TM Timer DIDQ 16x24V time-based IO module

### Technical specifications

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM Timer DIDQ 16x24V
<b>General information</b>	
Product type designation	TM Timer DIDQ 16x24V
<b>Product function</b>	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V13 Update 3
<b>Installation type/mounting</b>	
Rail mounting	Yes; S7-1500 mounting rail
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
<b>Encoder supply</b>	
Number of outputs	8; max. depending on parameterization
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	1.2 A; Total current of all encoders / channels, max. 0.5 A per output
<b>Digital inputs</b>	
Number of digital inputs	8; max. depending on parameterization
• in groups of	8
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Digital input with time stamp	Yes
- Number, max.	8
• Counter	Yes
- Number, max.	4
• Counter for incremental encoder	Yes
- Number, max.	4
• Digital input with oversampling	Yes
- Number, max.	8
• HW enable for digital input	Yes
- Number, max.	4
• HW enable for digital output	Yes
- Number, max.	4
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM Timer DIDQ 16x24V
<b>Input delay (for rated value of input voltage)</b>	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
<b>for standard inputs</b>	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
- at "0" to "1", min.	4 µs; for parameterization "none"
- at "1" to "0", min.	4 µs; for parameterization "none"
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	16; max. depending on parameterization
• in groups of	8
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Digital output with time stamp	Yes
- Number, max.	16
• PWM output	Yes
- Number, max.	16
• Digital output with oversampling	Yes
- Number, max.	16
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
<b>Load resistance range</b>	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per group, max.	4 A
• Current per module, max.	8 A; Observe derating

## Technical specifications

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM Timer DIDQ 16x24V
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• pulse encoder	Yes
<b>Encoder signal 24 V</b>	
- permissible voltage at input, min.	-30 V
- permissible voltage at input, max.	30 V
<b>Interface types</b>	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Isochronous mode</b>	
Bus cycle time (TDP), min.	250 µs
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM Timer DIDQ 16x24V
<b>Integrated Functions</b>	
Counter	
• Number of counters	4
• Counting frequency, max.	200 kHz; with quadruple evaluation
<b>Counting functions</b>	
• Continuous counting	Yes
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
<b>Decentralized operation</b>	
to SIMATIC S7-1500	Yes
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	320 g

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Technology modules

## TM PTO 4 interface module for PTO (Pulse Train Output)

### Overview

- 4-channel interface module for PTO (Pulse Train Output)
- 3 signal interfaces can be configured for speed and direction:
  - 24 V asymmetrical up to 200 kHz
  - RS 422, 5 V symmetrical up to 1 MHz
  - TTL 5 V asymmetrical up to 200 kHz
- 3 signal types can be configured:
  - Pulse and direction
  - Pulses for forward movement and pulses for backwards movement
  - 2 phase-shifted signals, with simple or quadruple evaluation
- Supported technology objects:
  - Speed controlled axis (S7-1500, S7-1500T)
  - Positioning axis (S7-1200, S7-1500, S7-1500T)
  - Synchronous axis (S7-1500, S7-1500T)
  - Probe (S7-1500, S7-1500T)

### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>Interface module for TM PTO 4 stepper drives</b> 4 Pulse Train Output PTO channels; PTO: 24 V or RS422; 2 DQ PTO, 2 DI 24 V, 1 DIQ 24 V per channel	<b>6ES7553-1AA00-0AB0</b>	<b>Universal front door for I/O modules</b> 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	<b>6ES7528-0AA00-7AA0</b>
<b>Accessories</b>		<b>Shielding set I/O</b> Infeed element, shield clamp, and shield terminal; 5 units, spare part	<b>6ES7590-5CA00-0AA0</b>
<b>Front connectors</b> For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin		<b>Shield terminal element</b> 10 units; spare part	<b>6ES7590-5BA00-0AA0</b>
• Screw terminals • Push-in	<b>6ES7592-1AM00-0XB0</b> <b>6ES7592-1BM00-0XB0</b>	<b>SIMATIC Manual Collection</b> SIMATIC Manual Collection on DVD in 5 languages, all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, PCS7, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	<b>6ES7998-8XC01-8YE0</b>
<b>DIN A4 labeling sheets</b> 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	<b>6ES7592-2AX00-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>U connector</b> 5 units; spare part	<b>6ES7590-0AA00-0AA0</b>		

### Technical specifications

Article number	<b>6ES7553-1AA00-0AB0</b> S7-1500, TM PTO4	Article number	<b>6ES7553-1AA00-0AB0</b> S7-1500, TM PTO4
<b>General information</b>		<b>Digital inputs</b>	
Product type designation	TM PTO 4	Number of digital inputs	12; 3 per channel, of which 1 DIQ
Number of channels	4; Axes	Digital inputs, parameterizable	Yes
<b>Product function</b>		Input characteristic curve in accordance with IEC 61131, type 3	Yes
• I&M data	Yes; I&M0 to I&M3	<b>Digital input functions, parameterizable</b>	
• Isochronous mode	Yes	• Synchronization	Yes
<b>Engineering with</b>		<b>Input voltage</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V14 or higher	• Type of input voltage	DC
• STEP 7 configurable/integrated from version	V5.5 SP3 with GSD file / -	• Rated value (DC)	24 V
• PROFINET from GSD version/GSD revision	GSDML V2.32	• for signal "0"	-5 ... +5 V
<b>Installation type/mounting</b>		• for signal "1"	+11 to +30V
Rail mounting	Yes; S7-1500 mounting rail	• permissible voltage at input, min.	-5 V
<b>Supply voltage</b>		• permissible voltage at input, max.	30 V
<b>Load voltage L+</b>		<b>Input current</b>	
• Rated value (DC)	24 V	• for signal "1", typ.	2.5 mA
• Reverse polarity protection	Yes		

## Technical specifications

Article number	<b>6ES7553-1AA00-0AB0</b> S7-1500, TM PTO4
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	4 µs; for parameterization "none"
- at "1" to "0", min.	4 µs; for parameterization "none"
<b>for technological functions</b>	
- parameterizable	Yes
<b>Digital outputs</b>	
Number of digital outputs	12; 3 per channel, of which 1 DIQ
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• PTO (pulse train output) signal interface	
- 24 V asymmetrical	Yes
- RS 422 symmetrical	Yes
- TTL (5 V) asymmetrical	Yes
• PTO (pulse train output) signal type	
- Pulse and direction	Yes
- Count up, count down	Yes
- Incremental encoder (A, B phase shift)	Yes
- Incremental encoder (A, B phase shift, quadruple)	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.1 A; 0.5 A for DIQn.2
• on lamp load, max.	1 W; 5 W for DIQn.2
<b>Load resistance range</b>	
• lower limit	240 Ω; 48 ohms for DIQn.2
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQn.2
<b>Output current</b>	
• for signal "1" rated value	0.1 A; 0.5 A for DIQn.2
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", typ.	1 µs; 28 µs for DIQn.2
• "1" to "0", typ.	1 µs; 25 µs for DIQn.2
<b>Switching frequency</b>	
• with resistive load, max.	1 kHz; For DIQn.2
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13, for DIQn.2
• on lamp load, max.	10 Hz; For DIQn.2
• For signal interface 24 V asymmetrical	200 kHz; With DQn.0 and DQn.1
• For signal interface RS 422 symmetrical	1 MHz
• For signal interface TTL (5 V) asymmetrical	200 kHz

Article number	<b>6ES7553-1AA00-0AB0</b> S7-1500, TM PTO4
<b>Isochronous mode</b>	
Bus cycle time (TDP), min.	250 µs; 375 µs if all 4 channels are used
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes; Thermal overload protection
• Group error	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes; Via control and feedback interface
to SIMATIC S7-400	Yes; Via control and feedback interface
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes; Via control and feedback interface
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	300 g

**SIMATIC S7-1500 Advanced Controllers**

I/O modules

Technology modules

**SIWAREX WP521 ST / WP522 ST****Overview**

SIWAREX WP521 ST



SIWAREX WP522 ST

SIWAREX WP521 ST / WP522 ST (ST = Standard) are versatile weighing modules for the SIMATIC S7-1500 Advanced Controller family. With these electronic weighing systems, simple weighing applications, such as platform or hopper scales, can be seamlessly integrated into the S7-1500 automation environment.

**Ordering data****Article No.****Weighing module TM  
SIWAREX WP521 ST****7MH4980-1AA01**

Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 x LC, 4 x DQ, 3 x DI, 1 x RS 485, Ethernet port, including shielding set.

**Weighing module  
TM SIWAREX WP522 ST****7MH4980-2AA01**

Two-channel, for two separate platform scales or hopper scales with analog load cells (1 - 4 mV/V), per channel 1 x LC, 4 x DQ, 3 x DI, 1 x RS 485, Ethernet port, including shielding set.

**SIMATIC S7-1500, front connector  
with screw-type terminals****6ES7592-1AM00-0XB0**

40-pin, for 35 mm wide modules, including 4 jumper links and cable ties

**SIMATIC S7-1500, front connector  
with push-in technology****6ES7592-1BM00-0XB0**

40-pin, for 35 mm wide modules, including 4 jumper links and cable ties

**SIWATOOL V4 & V7****7MH4900-1AK01**

Service and commissioning software for SIWAREX weighing modules

**Article No.****Ethernet cable patch cord 2 m  
(7 ft)****6XV1850-2GH20**

For connecting SIWAREX WP52x ST to a PC (SIWATOOL V7 or Modbus TCP/IP)

**Remote display (optional)**

The digital remote displays can be connected directly to the SIWAREX WP231 via the RS 485 interface.

Suitable remote display: S102  
Siebert Industrieelektronik GmbH  
PO Box 1180  
D-66565 Eppelborn  
Tel.: +49 6806/980-0  
Fax: +49 6806/980-999  
<https://www.siebert-group.com/en/>

Detailed information is available from the manufacturer.



Ordering data	Article No.	Commissioning	Article No.
<b>Accessories</b>		<b>Commissioning charge for one static scale with SIWAREX module</b>	<b>9LA1110-8SN50-0AA0</b>
<b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	<b>7MH5001-0AA20</b>	(Flat charge for travel and setup must be ordered separately)	
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel.	<b>7MH5001-0AA00</b>	Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale	
<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	<b>7MH5001-0AA01</b>	Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	
<b>SIWAREX IS Ex interface</b> For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. • Short-circuit current < 199 mA DC • Short-circuit current < 137 mA DC	<b>7MH4710-5BA</b> <b>7MH4710-5CA</b>	<b>Flat charge for travel and setup in Germany</b>	<b>9LA1110-8RA10-0AA0</b>
<b>Cable (optional)</b>			
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY</b> For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. • Sheath color: orange • For hazardous atmospheres. Sheath color: blue.	<b>7MH4702-8AG</b> <b>7MH4702-8AF</b>		

## Technical specifications

SIWAREX WP521 ST / WP522 ST		SIWAREX WP521 ST / WP522 ST	
<b>Weighing modes</b>	<ul style="list-style-type: none"> <li>• Non-automatic scales, e.g. platform and hopper scales</li> </ul>	<b>Parameter assignment</b>	<ul style="list-style-type: none"> <li>• Using function block in SIMATIC S7-1500 and HMI</li> <li>• Using SIWATOOL V7</li> <li>• Using Modbus TCP/IP</li> <li>• Using Modbus RTU</li> </ul>
<b>Ports</b>	<ul style="list-style-type: none"> <li>• 1 x SIMATIC S7-1500 system bus</li> <li>• 1 x Ethernet (SIWATOOL, Modbus TCP/IP)</li> <li>• 1 x RS 485 per channel (Modbus RTU or remote display)</li> <li>• 3 x digital inputs per channel (24 V DC)</li> <li>• 4 x digital outputs (24 V DC short-circuit proof) per channel</li> </ul>	<b>Remote display (see accessories)</b>	
<b>Functions</b>	<ul style="list-style-type: none"> <li>• 3 limits</li> <li>• Zeroing</li> <li>• Tare</li> <li>• Tare specification</li> <li>• Zero adjustment</li> <li>• Trace function for signal analysis</li> <li>• Internal restore point</li> <li>• SIMATIC S7-1500 integrated and/or stand-alone operation</li> </ul>	Connection	Via RS 485
		Display	Additional display for weight value
		<b>Measuring accuracy</b>	
		Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
		Internal resolution	Up to ± 4 million parts
		<b>Number of measurements/second</b>	100 or 120 (selectable)
		<b>Filter</b>	<ul style="list-style-type: none"> <li>• Low-pass filter 0.05 ... 50 Hz</li> <li>• Average value filter</li> </ul>

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Technology modules

## SIWAREX WP521 / WP522 ST

### Technical specifications

SIWAREX WP521 ST / WP522 ST	
<b>Weighing functions</b>	
Weight values	<ul style="list-style-type: none"> <li>• Gross</li> <li>• Net</li> <li>• Tare</li> </ul>
Limit values	<ul style="list-style-type: none"> <li>• 2 × min/max</li> <li>• 1 × empty</li> </ul>
Zeroing	Per command
Tare	Per command
Tare specification	Per command
<b>Compatible sensors</b>	Analog load cells / full-bridge strain gauges (1-4 mV/V) in 4-wire or 6-wire system
<b>Load cell powering</b>	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	<ul style="list-style-type: none"> <li>• <math>R_{Lmin}</math> &gt; 40 <math>\Omega</math></li> <li>• <math>R_{Lmax}</math> &lt; 4 100 <math>\Omega</math></li> </ul>
With SIWAREX IS Ex interface	<ul style="list-style-type: none"> <li>• <math>R_{Lmin}</math> &gt; 50 <math>\Omega</math></li> <li>• <math>R_{Lmax}</math> &lt; 4 100 <math>\Omega</math></li> </ul>
<b>Load cell characteristic</b>	1 ... 4 mV/V
<b>Permissible range of the measurement signal (with 4 mV/V sensors)</b>	-21.3 ... +21.3 mV
<b>Max. distance of load cells</b>	800 m (2 624 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface

SIWAREX WP521 ST / WP522 ST	
<b>Certificates</b>	<ul style="list-style-type: none"> <li>• ATEX Zone 2</li> <li>• UL</li> <li>• KCC</li> <li>• EAC</li> <li>• RCM</li> <li>• FM</li> <li>• IECEx</li> </ul>
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption WP521 ST / WP522 ST	120 mA / 200 mA
Max. power consumption SIMATIC Bus	35 mA @ 15 V
<b>IP degree of protection to EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b>	
$T_{min(IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Horizontal installation	-10 ... +60 °C (14 ... 140 °F)
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
<b>EMC requirements</b>	According to IEC 61000-6-2:2004; IEC 61000-6-4:2007+A1:2011
<b>Dimensions (W × H × D)</b>	35 × 147 × 129 mm (1.38 × 5.79 × 5.08 inch)

# SIMATIC S7-1500 Advanced Controllers

## I/O modules

### SIPLUS technology modules

#### SIPLUS TM Count 2x24V counter module

### Overview



- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

Ordering data	Article No.
<b>SIPLUS TM Count 2x24V counter module</b> (Extended temperature range and exposure to media) With 2-channels, max. 200 kHz; for 24 V encoder	<b>6AG1550-1AA00-7AB0</b>
<b>Accessories</b>	See SIMATIC S7-1500, TM Count 2x24V counter module, page 4/139

### Technical specifications

Article number	<b>6AG1550-1AA00-7AB0</b>
Based on	<b>6ES7550-1AA00-0AB0</b> SIPLUS S7-1500 TM Count 2X24V
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax; note derating for inductive loads; > +60 °C total current of the encoder supply max. 0.5 A, total current of the outputs max. 1 A
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads

Article number	<b>6AG1550-1AA00-7AB0</b>
Based on	<b>6ES7550-1AA00-0AB0</b> SIPLUS S7-1500 TM Count 2X24V
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

# SIMATIC S7-1500 Advanced Controllers

I/O modules

SIPLUS technology modules

## SIPLUS TM PosInput 2 position detection module

### Overview



- 2-channel counter and position detection module with RS422 interface
- Comprehensive parameterization options for optimum adaptation to the task
- Offloading of controller through preprocessing on the module
- Position detection with incremental and SSI absolute-value encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS422 signals or 5 V TTL signals

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

Ordering data	Article No.
<b>SIPLUS TM PosInput 2 counter and positioning module</b> (extended temperature range and medial exposure)  With 2-channels, max. 1 MHz counter frequency; for SSI and incremental encoders with RS422 or 5 V TTL interface	<b>6AG1551-1AB00-7AB0</b>
<b>Accessories</b>	See SIMATIC S7-1500, TM PosInput 2 counter and positioning module, page 4/142

### Technical specifications

Article number	<b>6AG1551-1AB00-7AB0</b>
Based on	<b>6ES7551-1AB00-0AB0</b> SIPLUS S7-1500 TM POSINPUT 2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads

Article number	<b>6AG1551-1AB00-7AB0</b>
Based on	<b>6ES7551-1AB00-0AB0</b> SIPLUS S7-1500 TM POSINPUT 2
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview



- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 Kbit/s
  - RS 232C, max. 115.2 Kbit/s
  - RS 422/RS 485, max. 19.2 Kbit/s
  - RS 422/RS 485, max. 115.2 Kbit/s
- Protocols supported
  - Freeport: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU Master
  - Modbus RTU Slave
  - USS, implemented through instructions

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>CM PtP RS 232 BA communication module</b> Basic communication module with one RS 232 interface, Freeport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 kbit/s	6ES7540-1AD00-0AA0	<b>Accessories</b> <b>RS 232 connecting cable</b> For linking to SIMATIC S7 5 m 10 m 15 m	6ES7902-1AB00-0AA0 6ES7902-1AC00-0AA0 6ES7902-1AD00-0AA0
<b>CM PtP RS 232 HF communication module</b> High Feature communication module with one RS 232 interface, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 kbit/s	6ES7541-1AD00-0AB0	<b>RS 422/485 connecting cable</b> For linking to SIMATIC S7 5 m 10 m 50 m	6ES7902-3AB00-0AA0 6ES7902-3AC00-0AA0 6ES7902-3AG00-0AA0
<b>CM PtP RS 422/485 BA communication module</b> Basic communication module with one RS 422/485 interface, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 kbit/s	6ES7540-1AB00-0AA0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	6ES7998-8XC01-8YE0
<b>CM PtP RS 422/485 HF communication module</b> High Feature communication module with one RS 422/485 interface, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 kbit/s	6ES7541-1AB00-0AB0	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

## CM PtP

### Technical specifications

Article number	6ES7540-1AD00-0AA0 S7-1500, CM PTP RS232 BA	6ES7541-1AD00-0AB0 S7-1500, CM PTP RS232 HF	6ES7540-1AB00-0AA0 S7-1500, CM PTP RS422/485 BA	6ES7541-1AB00-0AB0 S7-1500, CM PTP RS422/485 HF
<b>General information</b>				
Product type designation	CM PtP RS 232 BA	CM PtP RS 232 HF	CM PtP RS 422 / 485 BA	CM PtP RS 422 / 485 HF
<b>Product function</b>				
• I&M data	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0
• Fast startup	Yes	Yes	Yes	Yes
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	V12 / V12	V12 / V12	V12 / V12	V12 / V12
• STEP 7 configurable/integrated from version	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file
• PROFINET from GSD version/GSD revision	V2.3	V2.3 / -	V2.3	V2.3 / -
<b>Installation type/mounting</b>				
Rail mounting	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail
<b>Interface types</b>				
<b>RS 232</b>				
• Transmission rate, max.	19.2 kbit/s	115.2 kbit/s		
• Cable length, max.	15 m	15 m		
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD	RTS, CTS, DTR, DSR, RI, DCD		
<b>RS 485</b>				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m
<b>RS 422</b>				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m
• 4-wire full duplex connection			Yes	Yes
• 4-wire multipoint connection			No	No
<b>Protocols</b>				
<b>Integrated protocols</b>				
<b>Freepoint</b>				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
<b>3964 (R)</b>				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
<b>Modbus RTU master</b>				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
- Number of slaves, max.		1		32
<b>MODBUS RTU slave</b>				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
<b>Telegram buffer</b>				
• Buffer memory for telegrams	2 kbyte	8 kbyte	2 kbyte	8 kbyte
• Number of telegrams which can be buffered	255	255	255	255

## Technical specifications

Article number	6ES7540-1AD00-0AA0 S7-1500, CM PTP RS232 BA	6ES7541-1AD00-0AB0 S7-1500, CM PTP RS232 HF	6ES7540-1AB00-0AA0 S7-1500, CM PTP RS422/485 BA	6ES7541-1AB00-0AB0 S7-1500, CM PTP RS422/485 HF
<b>Interrupts/diagnostics/ status information</b>				
Diagnostics function	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	No	No	No	No
<b>Diagnoses</b>				
• Wire-break	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• Receive RxD	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Transmit TxD	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
<b>Potential separation between backplane bus and interface</b>				
	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
<b>Decentralized operation</b>				
to SIMATIC S7-300	Yes	Yes	Yes	Yes
to SIMATIC S7-400	Yes	Yes	Yes	Yes
to SIMATIC S7-1500	Yes	Yes	Yes	Yes
to standard PROFINET controller	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	127 mm	127 mm	127 mm	127 mm
<b>Weights</b>				
Weight, approx.	0.22 kg	0.22 kg	0.22 kg	0.22 kg

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

## CM 8xIO-Link

### Overview



- Communication module for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors
- Can be used directly downstream of an S7-1500 CPU or distributed in ET 200MP via PROFINET or PROFIBUS
- Powerful diagnostics functions facilitate preventive maintenance to avoid plant standstills
- Easy replacement of sensors/actuators without time-consuming parameter assignment

### Ordering data

#### Article No.

Ordering data	Article No.
<b>CM 8xIO-Link communication module</b> Communication module for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors	<b>6ES7547-1JF00-0AB0</b>
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>

### Technical specifications

Article number	<b>6ES7547-1JF00-0AB0</b> S7-1500, CM 8xIO-Link
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V15.1 with HSP 274
• STEP 7 configurable/ integrated from version	Configurable via GSD file
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	8
<b>Output current</b>	
• Rated value	1 A; 4 A total current per module
<b>24 V encoder supply</b>	
• Short-circuit protection	Yes; per channel, electronic
<b>IO-Link</b>	
Number of ports	8
• of which simultaneously controllable	8
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Cycle time, min.	2 ms
Size of process data, input per port	33 byte; max.
Size of process data, input per module	240 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	240 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m
<b>Operating modes</b>	
• IO-Link	Yes
• DI	Yes
• DQ	No
<b>Time Based IO</b>	
- TIO IO-Link IN	No
- TIO IO-Link OUT	No
- TIO IO-Link IN/OUT	No
<b>Connection of IO-Link devices</b>	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal



## Technical specifications

Article number	<b>6ES7547-1JF00-0AB0</b> S7-1500, CM 8xIO-Link
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes

Article number	<b>6ES7547-1JF00-0AB0</b> S7-1500, CM 8xIO-Link
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

## CM 1542-5

### Overview



DP-M	DP-S	FMS	PG/OP	S7	
●	●		●	●	

The CM 1542-5 communications module expands the SIMATIC S7-1500 Controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module can also be used to implement separate PROFIBUS lines, in other words, to control a number of different field devices via a number of PROFIBUS segments. The CM 1542-5 assumes all communication tasks, thus reducing the CPU workload.

The CM 1542-5 is suitable for S7 communication as well as for conventional PROFIBUS communication. This makes it possible to establish communication between the S7-1500 Controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
  - Open user communication (SEND/RECEIVE) via FDL
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

### Ordering data

### Article No.

#### CM 1542-5 communications module

Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; S7 and PG/OP communication, data record routing, time synchronization, diagnostics

**6GK7542-5DX00-0XE0**

#### Accessories

#### PROFIBUS FastConnect RS 485 connection plug

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps

- Without PG interface
- With programming device interface

**6ES7972-0BA52-0XA0**  
**6ES7972-0BB52-0XA0**

#### PROFIBUS FC Standard Cable

2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter

**6XV1830-0EH10**

#### PROFIBUS FastConnect Stripping Tool

Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable

**6GK1905-6AA00**

#### PROFIBUS bus terminal 12M

Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable

**6GK1500-0AA10**

#### Note:

You can find order information for software for communication with PC systems in the Industry Mall.

### Technical specifications

Article number	<b>6GK7542-5DX00-0XE0</b>
product type designation	CM 1542-5
<b>transfer rate</b>	
transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.2 A
power loss [W]	3 W

#### Technical specifications

Article number	<b>6GK7542-5DX00-0XE0</b>
product type designation	CM 1542-5
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.4 kg
fastening method	
• S7-1500 rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	8
• note	depending on CPU type
<b>performance data open communication</b>	
number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	30
data volume	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte
<b>performance data PROFIBUS DP</b>	
service as DP master	
• DPV1	Yes
number of DP slaves	
• on DP master operable	125
data volume	
• of the address range of the inputs as DP master total	8 192 byte
• of the address range of the outputs as DP master total	8 192 byte
• of the address range of the inputs per DP slave	244 byte
• of the address range of the outputs per DP slave	244 byte
service as DP slave	
• DPV0	Yes
• DPV1	Yes
data volume	
• of the address range of the inputs as DP slave total	240 byte
• of the address range of the outputs as DP slave total	240 byte

Article number	<b>6GK7542-5DX00-0XE0</b>
product type designation	CM 1542-5
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	48; depending on the system upper limit
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	48
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	No
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 Professional V12 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes; via S7-1500 CPU
<b>product functions time</b>	
product function pass on time synchronization	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

**SIMATIC S7-1500 Advanced Controllers**

I/O modules

Communication

**CP 1542-5****Overview**

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●		

The CP 1542-5 communications processor expands the SIMATIC S7-1500 Controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. This processor allows the implementation of separate PROFIBUS lines, in other words the control of multiple field devices over multiple PROFIBUS segments. The CP 1542-5 handles all communication tasks, thus reducing the CPU load.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)

Communication services:

- PROFIBUS DP
- PG/OP communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG

**Ordering data****Article No.****CP 1542-5 communications processor**

Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; PG/OP communication, time synchronization, diagnostics; smaller quantity structure

**6GK7542-5FX00-0XE0****Accessories****PROFIBUS FastConnect RS 485 connection plug**

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps

- Without programming device interface
- With programming device interface

**6ES7972-0BA52-0XA0****6ES7972-0BB52-0XA0****PROFIBUS FC Standard Cable**

2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter

**6XV1830-0EH10****PROFIBUS FastConnect Stripping Tool**

Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable

**6GK1905-6AA00****PROFIBUS bus terminal 12M**

Bus terminal for connection of PROFIBUS stations for up to 12 Mbps with connecting cable

**6GK1500-0AA10****Note:**

You can find order information for software for communication with PC systems in the Industry Mall.

#### Technical specifications

Article number	<b>6GK7542-5FX00-0XE0</b>
product type designation	CP 1542-5
<b>transfer rate</b>	
transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.1 A
power loss [W]	1.5 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.27 kg
fastening method	
• S7-1500 rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	8
• note	depending on CPU type

Article number	<b>6GK7542-5FX00-0XE0</b>
product type designation	CP 1542-5
<b>performance data PROFIBUS DP</b>	
service as DP master	
• DPV1	Yes
number of DP slaves	
• on DP master operable	32
data volume	
• of the address range of the inputs as DP master total	2 048 byte
• of the address range of the outputs as DP master total	2 048 byte
• of the address range of the inputs per DP slave	244 byte
• of the address range of the outputs per DP slave	244 byte
service as DP slave	
• DPV0	Yes
• DPV1	Yes
data volume	
• of the address range of the inputs as DP slave total	240 byte
• of the address range of the outputs as DP slave total	240 byte
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16; depending on the system upper limit
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	16
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	No
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 Professional V12 SP1 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes; via S7-1500 CPU
<b>product functions time</b>	
product function pass on time synchronization	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

**SIMATIC S7-1500 Advanced Controllers**

I/O modules

Communication

**CM 1542-1****Overview**

ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●	●	●	●	●

Communications module for connecting a SIMATIC S7-1500 to PROFINET networks as PROFINET IO controller or PROFINET IO device.

The CM 1542-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication;
  - web diagnostics by means of access to the Web server of the S7-1500 system
  - Static IP routing with up to 1 Mbps via IPv4 to other CM 1543-1 / CM 1542-1 units in an S7-1500 station, e.g., for web server accesses without real-time capability.

**Ordering data****Article No.****CM 1542-1 communications module****6GK7542-1AX00-0XE0**

For connecting SIMATIC S7-1500 to PROFINET IO, TCP/IP, ISO-on-TCP, UDP, S7 communication, IP broadcast/multicast, SNMPV1, time synchronization via NTP; 2 x RJ45 interface with 10/100 Mbps

**Accessories****IE FC RJ45 Plug 4 x 2**

RJ45 plug-in connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB11-2AA0**  
**6GK1901-1BB11-2AB0**  
**6GK1901-1BB11-2AE0**

**IE FC TP Standard Cable GP 4 x 2**

8-wire, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

- AWG22, for connection to IE FC RJ45 modular outlet
- AWG24, for connection to IE FC RJ45 plug 4 x 2

**6XV1870-2E**  
**6XV1878-2A**

**SCALANCE X204-2 Industrial Ethernet Switch****6GK5204-2BB10-2AA3**

Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports

**SCALANCE X308-2 Industrial Ethernet Switch****6GK5308-2FL10-2AA3**

2 x 1000 Mbps SC ports, optical (multimode, glass), up to 750 m, 1 x 10/100/1 000 Mbps RJ45 port, electrical 7 x 10/100 Mbps RJ45 ports, electrical

#### Technical specifications

Article number	<b>6GK7542-1AX00-0XE0</b>
product type designation	CM 1542-1
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.22 A
power loss [W]	3.3 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.4 kg
fastening method	
• S7-1500 rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	8
• note	depending on CPU type

Article number	<b>6GK7542-1AX00-0XE0</b>
product type designation	CM 1542-1
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum	64; depending on the system upper limit
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
number of Multicast stations	6
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	64; depending on the system upper limit
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	64
<b>performance data PROFINET communication as PN IO controller</b>	
product function PROFINET IO controller	Yes
number of PN IO devices on PROFINET IO controller operable total	128
number of PN IO IRT devices on PROFINET IO controller operable	64
number of external PN IO lines with PROFINET per rack	10
data volume	
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for output variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

## CM 1542-1

### Technical specifications

Article number	<b>6GK7542-1AX00-0XE0</b>
product type designation	CM 1542-1
<b>performance data PROFINET communication as PN IO device</b>	
product function PROFINET IO device	Yes
data volume	
• as user data for input variables as PROFINET IO device maximum	8 192 byte
• as user data for output variables as PROFINET IO device maximum	8 192 byte
• as user data for input variables for each sub-module as PROFINET IO device	256 byte
• as user data for output variables for each sub-module as PROFINET IO device	256 byte
• as user data for the consistency area for each sub-module	256 byte
number of submodules per PROFINET IO-Device	32
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	Yes
<b>product functions management, configuration, engineering</b>	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 – device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes; via S7-1500 CPU
<b>product functions switch</b>	
product feature switch	Yes
product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• configuration with STEP 7	Yes

Article number	<b>6GK7542-1AX00-0XE0</b>
product type designation	CM 1542-1
<b>product functions routing</b>	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
<b>product functions redundancy</b>	
product function	
• ring redundancy	Yes
• redundancy manager	Yes
protocol is supported Media Redundancy Protocol (MRP)	Yes
<b>product functions security</b>	
product function	
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	No
<b>product functions time</b>	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●	●	●	●

The SIMATIC CP 1543-1 communications processor securely connects the new SIMATIC S7-1500 Controller to Industrial Ethernet networks. By combining a variety of security features such as stateful packet inspection firewalls and VPNs, and data encryption protocols such as FTPS and SNMPv3, the communications processor protects individual S7-1500 stations or even entire automation cells against unauthorized access.

The CP can also be used for linking the S7-1500 station into an IPv6-based network. All functions are configured by means of STEP 7 Professional V12 (TIA Portal) or higher.

The CP 1543-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open user communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Access (read and write modes) to csv files stored on the memory card of the CPU via FTP(S)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1543-1 / CM 1542-1 units in an S7-1500 system, e.g. for web server accesses without real-time capability
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
  - Encrypted email communication via SMTPS (Port 587)
  - Open communication over TCP/IP
- Integration of the S7-1500 into IPv6-based networks
 

An IPv6-compliant IP address can be used for the following communication services:

  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing by program block
  - Email transfer with addressing by program block

## Ordering data

## Article No.

**CP 1543-1 communications processor**

For connecting SIMATIC S7-1500 to Industrial Ethernet via TCP/IP, ISO and UDP and security functions (VPN, firewall); 1 x RJ45 interface with 10/100/1 000 Mbps; SNMPv1/V3; time synchronization via NTP, FTP, email, IPv4/IPv6

6GK7543-1AX00-0XE0

**Accessories****IE FC RJ45 plug 180 2 x 2**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

## Article No.

**IE FC RJ45 plug 4 x 2**

RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB11-2AA0  
6GK1901-1BB11-2AB0  
6GK1901-1BB11-2AE0

**IE FC TP Standard Cable GP 2 x 2 (Type A)**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

6XV1840-2AH10

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

CP 1543-1

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## Ordering data

### IE FC TP Standard Cable GP 4 x 2

8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

- AWG22, for connection to IE FC RJ45 Modular Outlet
- AWG24, for connection to IE FC RJ45 plug 4 x 2

6XV1870-2E

6XV1878-2A

### IE FC Stripping Tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

### Industrial Ethernet Switch SCALANCE X204-2

Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports

6GK5204-2BB10-2AA3

### Industrial Ethernet Switch SCALANCE X308-2

2 x 1000 Mbps multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1 000 Mbps RJ45 port, 7 x 10/100 Mbps RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m

6GK5308-2FL00-2AA3

### Note:

You can find order information for software for communication with PC systems in the Industry Mall.

## Technical specifications

Article number	<b>6GK7543-1AX00-0XE0</b>
product type designation	CP 1543-1
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.35 A
power loss [W]	5.3 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Article number	<b>6GK7543-1AX00-0XE0</b>
product type designation	CP 1543-1
<b>design, dimensions and weights</b>	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.35 kg
fastening method	
• S7-1500 rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	8
• note	depending on CPU type
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
number of Multicast stations	118
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	118; depending on the system upper limit
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	118

#### Technical specifications

Article number	<b>6GK7543-1AX00-0XE0</b>
product type designation	CP 1543-1
<b>performance data IT functions</b>	
number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
number of possible connections	
• as server by means of HTTP maximum	4
• as email client maximum	1
data volume as user data for email maximum	64 Kibyte
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	Yes
<b>product functions management, configuration, engineering</b>	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	No
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&MO - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes; via S7-1500 CPU
<b>product functions routing</b>	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPOE via DSL	No

Article number	<b>6GK7543-1AX00-0XE0</b>
product type designation	CP 1543-1
<b>product functions security</b>	
firewall version	stateful inspection
product function with VPN connection	IPSec
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1
number of possible connections with VPN connection	16
product function	
• password protection for Web applications	No
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	Yes
<b>product functions time</b>	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

## SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

### CP 1545-1

#### Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●	●	●	●

The SIMATIC CP 1545-1 communications processor securely connects the SIMATIC S7-1500 Controller to Industrial Ethernet networks. The new CloudConnect functionality enables easy and reliable transfer of all selected data from the SIMATIC S7-1500 to MindSphere, or a cloud solution that supports the standardized MQTT protocol, e.g. Microsoft Azure or IBM Cloud. The CP protects the SIMATIC S7-1500 station from unauthorized access with the integrated SPI (Stateful Packet Inspection) firewall. Data from cloud systems or MQTT brokers can also be received using the MQTT protocol.

The CloudConnect function of the CP 1545-1 is easy to configure with a few input screens in TIA Portal. First, all the parameters required for the different cloud platforms are specified. The data intended for the cloud is then selected from the tag management of the SIMATIC S7-1500 and saved as topics to be transferred with the corresponding trigger conditions.

All functions are configured using STEP 7 Professional V15.1 update 3 (TIA Portal) or higher. The CP 1545-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open user communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - MQTT Publish for transferring selected data to a cloud system or MQTT broker
  - MQTT Subscribe for receiving data from a cloud system or MQTT broker
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Access (read and write modes) to csv files stored on the memory card of the CPU via FTP(S)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication to an email server (also with IPv6)
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1545-1 / CP 1543-1 / CM 1542-1 units in the S7-1500 system, e.g. for web server accesses without real-time capability
- Security Integrated
  - Stateful Packet Inspection Firewall
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure time of day transfer (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
  - Encrypted email communication via SMTPS (Port 587)
  - Secure open communication over TCP/IP
- Integration of the S7-1500 into IPv6-based networks
  - An IPv6-compliant IP address can be used for the following communications services:
    - MQTT
    - FETCH/WRITE access (CP as server)
    - FTP server mode
    - FTP client mode with addressing via program block
    - Email transfer with addressing via program block

#### Ordering data

#### Article No.

##### CP 1545-1 communications processor

CP 1545-1 communications processor for connecting the SIMATIC S7-1500 to Industrial Ethernet; TCP/IP, UDP, S7 communication, security (firewall), SNMPv1/v3, DHCP, FTP client/server, email, IPv4/IPv6, time synchronization via NTP, connection to cloud systems via MQTT, 1x RJ45 (10/100/1 000 Mbps)

**6GK7545-1GX00-0XE0**

#### Technical specifications

Article number	<b>6GK7545-1GX00-0XE0</b>
product type designation	CP 1545-1
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port

#### Note:

You can find order information for software for communication with PC systems in the Industry Mall under System connections – Software overview

#### Technical specifications

Article number	<b>6GK7545-1GX00-0XE0</b>
product type designation	CP 1545-1
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.3 A
power loss [W]	4.5 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.32 kg
fastening method	
• S7-1500 rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	8
• note	depending on CPU type
<b>product functions cloud connectivity</b>	
protocol is supported	
• Message Queuing Telemetry Transport (MQTT)	Yes
• Advanced Message Queuing Protocol (AMQP)	No
product function for cloud connectivity	
• trigger management	Yes
• time stamping	Yes
product feature for cloud connectivity buffered message frame memory	No
number of data points per device maximum	500

Article number	<b>6GK7545-1GX00-0XE0</b>
product type designation	CP 1545-1
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
number of Multicast stations	118
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	118; depending on the system upper limit
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	118
<b>performance data IT functions</b>	
number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
number of possible connections	
• as server by means of HTTP maximum	4
• as email client maximum	1
data volume as user data for email maximum	64 Kibyte
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	Yes
<b>product functions management, configuration, engineering</b>	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V15.1 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes

**SIMATIC S7-1500 Advanced Controllers**

I/O modules

Communication

**CP 1545-1****Technical specifications**

Article number	<b>6GK7545-1GX00-0XE0</b>
product type designation	CP 1545-1
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes; via S7-1500 CPU
<b>product functions routing</b>	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
<b>product functions security</b>	
firewall version	stateful inspection
product function	
• password protection for Web applications	No
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	Yes

Article number	<b>6GK7545-1GX00-0XE0</b>
product type designation	CP 1545-1
<b>product functions time</b>	
product function SICLOCK support	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



- TIM 1531 IRC communications module for telecontrol applications with four interfaces as a stand-alone device for SIMATIC S7-1500 for use in wide area networks (WANs)
- For universal use in a station, node station and control center
- Communication either via the SINAUT ST7, IEC 60870-5-101/104 or DNP3 telecontrol protocols
- Operation via VPN (IPsec/OpenVPN) with additional SIMATIC NET components
- Wireless communication via mobile wireless routers, modems or radio devices
- Wired communication via Ethernet, Internet, 2/4-wire cables (SHDSL), dialup modems or dedicated line modem
- Frame buffer for seamless recording of data
- Support of redundant communication paths
- Simple configuration with STEP 7 Professional V15.1 (TIA Portal)

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>TIM 1531 IRC communications module</b> TIM 1531 IRC TIM 1531 IRC communications module for SIMATIC S7-1500, S7-400, S7-300 with SINAUT ST7, DNP3 and IEC 60870-5-101/104 with three RJ45 interfaces for communication via IP-based networks (WAN/LAN) and an RS232/RS485 interface for communication via conventional WANs	6GK7543-1MX00-0XE0	<b>SCALANCE M876-3</b> 3G router; for wireless IP communication of Ethernet-based programmable controllers via 3G mobile wireless HSPA+/EV-DO, VPN, firewall, NAT 4-port switch; antenna diversity; 1 x digital input, 1 x digital output; note country approvals. Note provider approvals!	6GK5876-3AA02-2BA2
<b>Engineering Software STEP 7 Professional V17</b> <ul style="list-style-type: none"> <li>• SIMATIC STEP 7 Professional V17 floating license</li> <li>• Upgrade SIMATIC STEP 7 Basic V11 ... V16 → V17 floating license</li> </ul>	6ES7822-1AA07-0YA5 6ES7822-0AA07-0YE5	<b>SCALANCE M876-4 (EU)</b> 4G router; for wireless IP communication of Ethernet-based programmable controllers via LTE (4G) mobile wireless optimized for use in Europe, VPN, firewall, NAT; 4-port switch; 2 x SMA antenna, MIMO technology; 1 x digital input, 1 x digital output; note country approvals.	6GK5876-4AA00-2BA2
<b>Accessories</b>		<b>SCALANCE M876-4 (NAM)</b> 4G router (NAM); for wireless IP communication of Ethernet-based programmable controllers via LTE (4G) mobile wireless optimized for use in North America, VPN, firewall, NAT; 4-port switch; 2 x SMA antenna, MIMO technology; 1 x digital input, 1 x digital output; note country approvals.	6GK5876-4AA00-2DA2
<b>DIN rail</b> SIMATIC S7-1500, 160 mm DIN rail; incl. grounding screw, integrated DIN rail for mounting small items, such as terminals, relays	6ES7590-1AB60-0AA0	<b>SCALANCE M874-3</b> 3G mobile wireless routers (GPRS/EDGE/HSPA+); 2 RJ45 ports, firewall, VPN, NAT	6GK5874-3AA00-2AA2
<b>SIMATIC Memory Card</b> SIMATIC S7, Memory Card for S7-1x 00 CPU/SINAMICS, 3.3 V flash, 24 MB	6ES7954-8LF03-0AA0	<b>SCALANCE M812-1 ADSL router</b> For wired IP communication of Ethernet-based automation devices via Internet Service Providers; VPN, firewall, NAT; 1x Ethernet RJ45 port, 1x digital input, 1x digital output; ADSL2+, Annex B	6GK5812-1BA00-2AA2

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

## TIM 1531 IRC (for S7-1500)

Ordering data	Article No.	Ordering data	Article No.
<b>SCALANCE M812-1 ADSL router</b> For wired IP communication of Ethernet-based automation devices via Internet Service Providers; VPN, firewall, NAT; 4-port switch; 1x digital input, 1x digital output; ADSL2+, Annex A	6GK5812-1BA00-2AA2	<b>Connecting cable</b> With one end open for connecting a TIM (RS232) to a third-party modem or radio unit (RS232); cable length 2.5 m	6NH7701-4BN
<b>SCALANCE M816-1 ADSL router</b> For wired IP communication of Ethernet-based automation devices via Internet Service Providers; VPN, firewall, NAT; 4-port switch; 1x digital input, 1x digital output; ADSL2+, Annex B, J	6GK5816-1BA00-2AA2	<b>Connecting cable</b> For connecting two TIMs via their RS232 interfaces without modems (null modem); cable length 6 m	6NH7701-0AR
<b>SCALANCE M826-2 SHDSL router</b> For IP communication via the 2-wire and 4-wire cables of Ethernet-based automation devices; SHDSL topology: point-to-point, bonding, line bridge mode, routing mode with VPN, firewall, NAT; 4-port switch, 1x digital input, 1x digital output	6GK5826-2AB00-2AB2	<b>SITOP compact 24 V/0.6 A</b> Single-phase power supply with wide range input 85 ... 264 V AC/110 ... 300 V DC, 24 V stabilized output voltage, 0.6 A nominal value of output current, slim design	6EP1331-5BA00
<b>MD720 modem</b> GSM/GPRS, 2G mobile wireless modem with RS232 interface; for GSM services CSD, GPRS, SMS; Quadband GSM; AT command interface; note country-specific approvals! Autom. GPRS connection; including gender changer for RS232/PPI adapter	6NH9720-3AA01-0XX0	<b>SIMATIC PM 1507 24 V/3 A</b> Stabilized power supply for SIMATIC S7-1500 input: 120/230 V AC output: 24 V DC/3 A	6EP1332-4BA00
		<b>SIMATIC PM 1507 24 V/8 A</b> Stabilized power supply for SIMATIC S7-1500 input: 120/230 V AC output: 24 V DC/8 A <ul style="list-style-type: none"> <li>• Output current 3 A</li> <li>• Output current 8 A</li> </ul>	6EP1333-4BA00

### Note:

You will find ordering data for software for communicating with PC systems in the Industry Mall under System connections – Software overview

## Technical specifications

Article number	6GK7543-1MX00-0XE0	Article number	6GK7543-1MX00-0XE0
product type designation	TIM 1531 IRC	product type designation	TIM 1531 IRC
<b>transfer rate</b>		<b>supply voltage, current consumption, power loss</b>	
transfer rate		type of voltage of the supply voltage	DC
• at the 1st interface	10 ... 1 000 Mbit/s	supply voltage	24 V
• at the 2nd interface	10 ... 100 Mbit/s	supply voltage	20.4 ... 28.8 V
• at interface 3	10 ... 100 Mbit/s	supply voltage external at DC rated value	24 V
• acc. to RS 232	300 ... 115 200 bit/s	supply voltage external at DC rated value	20.4 ... 28.8 V
<b>interfaces</b>		consumed current	
number of interfaces acc. to Industrial Ethernet	3	• from external supply voltage at DC at 24 V typical	0.15 A
number of electrical connections		• from external supply voltage at DC at 24 V maximum	0.3 A
• for external data transmission acc. to RS 232	1	power loss [W] with external supply voltage at 24 V DC	
• for power supply	1	• in update mode typical	3.9 W
number of slots		• in communication mode typical	3.9 W
• for memory cards	1	product extension optional backup battery	No
type of electrical connection			
• of Industrial Ethernet interface	RJ45 port		
type of electrical connection			
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485		
• for power supply	2-pole plugable terminal block		
slot version			
• of the memory card	SD 1.0, SD 1.1, SDHC, Siemens SMC		
storage capacity of the memory card maximum	32 Gbyte		



#### Technical specifications

Article number	<b>6GK7543-1MX00-0XE0</b>
product type designation	TIM 1531 IRC
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 70 °C
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-1500 double-wide
width	70 mm
height	147 mm
depth	129 mm
net weight	0.525 kg
fastening method	
• 35 mm top hat DIN rail mounting	No
• S7-300 rail mounting	No
• S7-1500 rail mounting	Yes
<b>product features, product functions, product components general</b>	
product function	
• DynDNS client	No
number of units	
• note	Number of TIM per S7-1500: 1
wire length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	132; only via LAN
• with PG connections maximum	4
• with PG/OP connections maximum	4
• with OP connections maximum	4
service	
• of SIMATIC communication as server	Yes
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes

Article number	<b>6GK7543-1MX00-0XE0</b>
product type designation	TIM 1531 IRC
<b>performance data IT functions</b>	
number of possible connections	
• as server by means of HTTP maximum	2
• as server by means of HTTPS maximum	2; 2 per Ethernet interface
• as email client maximum	1
<b>performance data telecontrol</b>	
suitability for use	
• node station	Yes
• substation	Yes
• TIM control center	Yes
control center connection	Systems with ST7, DNP3 and IEC 60870-5-101/104 protocol
• by means of a permanent connection	Systems with ST7, DNP3 and IEC 60870-5-101/104 protocol
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	Yes
• Modbus RTU	No
product function data buffering if connection is aborted	Yes; 100000 data telegrams (ST7) or 250000 events (IEC 60870-5 / DNP3)
number of data points per station maximum	3 000
number of DNP3 masters	
• for Ethernet maximum	4
• with RS 232 interface maximum	4
product feature buffered message frame memory	Yes
transmission format	
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure
• with dial-up network with SINAUT ST7 protocol	spontaneous
hamming distance	
• for SINAUT ST7 protocol	4
<b>performance data teleservice</b>	
diagnostics function online	Yes
diagnostics with SIMATIC STEP 7	
product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes
• remote configuration	Yes

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

## TIM 1531 IRC (for S7-1500)

### Technical specifications

Article number	<b>6GK7543-1MX00-0XE0</b>
product type designation	TIM 1531 IRC
<b>product functions management, configuration, engineering</b>	
product function MIB support protocol is supported	Yes
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 SP1 (TIA Portal) or higher
• for CPU configuring required SINAUT TD7 block library for CPU	No
• for PG configuring required SINAUT ST7 configuration software for PG	No
storage location of TIM configuration data	Flash or SD card of the TIM 1531 IRC
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
• I&M2 - installation date	Yes
• I&M3 - comment	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes
<b>product functions routing</b>	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	Yes
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• Ppoe via DSL	No

Article number	<b>6GK7543-1MX00-0XE0</b>
product type designation	TIM 1531 IRC
<b>product functions security</b>	
product function	
• MSC client via GPRS modem with MSC capability	Yes
protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
key length for MSC with Virtual Private Network	128 bit
number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	127
<b>product functions time</b>	
product function SICLOCK support	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
product component hardware real time clock	No
product feature hardware real time clock w. battery backup	No
time synchronization	
• from NTP-server	Yes
• from GPS-signal	No
• from control center	Yes
• from mobile network provider	No
• PC	No
• manual setting	No
<b>product functions position detection</b>	
product function	
• position detection with GPS	No
• pass on position data	No
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



- Access points in SIMATIC S7-1500 design are suitable for applications where the device is to be mounted in the control cabinet

## Ordering data

### Access Points SCALANCE W774

IWLAN access points with built-in wireless interface for establishing wireless connections with iFeatures; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbps; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20°C to +60°C); scope of supply: Mounting hardware; 4-pin screw terminal for 24 V DC; manual on CD-ROM; English/German

### SCALANCE W774-1 RJ45

- IWLAN Access Point with one built-in wireless interface
- Country approvals for operation outside the USA
  - Country approvals for operation within the USA <sup>1)</sup>
  - Country approvals for operation in Israel <sup>1)</sup>

### Accessories

#### KEY-PLUG W780 iFeatures

Removable data storage medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W access points with PLUG compartment

#### C-PLUG

Removable data storage medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment

## Article No.

6GK5774-1FX00-0AA0

6GK5774-1FX00-0AB0

6GK5774-1FX00-0AC0

6GK5907-8PA00

6GK1900-0AB10

## Article No.

### IE FC RJ45 plug 180 2 x 2

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

### IE FC Standard Cable GP 2 x 2

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

6XV1840-2AH10

### IE FC Stripping Tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

### Antennas and miscellaneous IWLAN accessories

See Industry Mall, Industrial Wireless LAN/accessories

<sup>1)</sup> Please note country approvals under:  
<http://www.siemens.com/wireless-approvals>

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

## SCALANCE W774 RJ45 for the control cabinet

### Technical specifications

Article number	<b>6GK5774-1FX00-0AA0</b> 6GK5774-1FX00-0AB0 <sup>1)</sup> 6GK5774-1FX00-0AC0 <sup>2)</sup>
Product type designation	W774-1 RJ45
<b>Transfer rate</b>	
Transfer rate	
• with WLAN maximum	300 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
Transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	100 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• for network components or terminal equipment	2
• for power supply	1
• for redundant voltage supply	1
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
Design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
<b>Interfaces wireless</b>	
Number of radio cards permanently installed	1
Transmission mode for multiple input multiple output (MIMO)	2x2
Number of spatial streams	2
Number of electrical connections for external antenna(s)	2
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product feature external antenna can be mounted directly on device	Yes
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
Consumed current	
• at DC at 24 V typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
Power loss [W]	
• at DC at 24 V typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W

Article number	<b>6GK5774-1FX00-0AA0</b> 6GK5774-1FX00-0AB0 <sup>1)</sup> 6GK5774-1FX00-0AC0 <sup>2)</sup>
Product type designation	W774-1 RJ45
<b>ambient conditions</b>	
Ambient temperature	
• during operation	-20 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	97 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP30
<b>Design, dimensions and weights</b>	
Width	26 mm
Height	156 mm
Depth	127 mm
Width of the enclosure without antenna	26 mm
Height of the enclosure without antenna	147 mm
Depth of the enclosure without antenna	127 mm
Net weight	0.52 kg
Fastening method	wall mounting only if flat mounted
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	Yes
• 35 mm top hat DIN rail mounting	Yes
• wall mounting	Yes
<b>Radio frequencies</b>	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals
<b>Product features, product functions, product components general</b>	
Product function Access Point Mode	Yes
Product function client Mode	Yes
Number of SSIDs	4
Product function	
• iPCF Access Point	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
• iPCF-MC Access Point	No
• iPCF-MC client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
Number of iPCF-capable radio modules	1
Product function iREF	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
Number of iREF-capable radio modules	1
Product function iPRP	Yes; In combination with the 'KEY-PLUG W780 iFeatures' only

<sup>1)</sup> Wireless approval in the USA

<sup>2)</sup> Wireless approval in the Israel

## Technical specifications

Article number	<b>6GK5774-1FX00-0AA0</b> 6GK5774-1FX00-0AB0 <sup>1)</sup> 6GK5774-1FX00-0AC0 <sup>2)</sup>
Product type designation	W774-1 RJ45
<b>Product functions management, configuration, engineering</b>	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• operation with IWLAN controller	No
• operation with Enterasys WLAN controller	No
• forced roaming on IP down with IWLAN	Yes
• forced roaming on link down with IWLAN	Yes
• WDS	Yes
protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
<b>Product functions diagnostics</b>	
Product function	
• PROFINET IO diagnosis	Yes
• link check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	Yes
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes

Article number	<b>6GK5774-1FX00-0AA0</b> 6GK5774-1FX00-0AB0 <sup>1)</sup> 6GK5774-1FX00-0AC0 <sup>2)</sup>
Product type designation	W774-1 RJ45
<b>Product functions VLAN</b>	
Product function	
• function VLAN with IWLAN	Yes
<b>Product functions DHCP</b>	
Product function	
• DHCP client	Yes
• DHCP server	Yes
• DHCP Option 82	Yes
<b>Product functions redundancy</b>	
Protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
<b>Product functions security</b>	
Product function	
• ACL - MAC-based	Yes
• management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
protocol is supported	
• SSH	Yes
• RADIUS	Yes
<b>Product functions time</b>	
Protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes

1) Wireless approval in the USA

2) Wireless approval in the Israel

**SIMATIC S7-1500 Advanced Controllers**

I/O modules

Communication

**SCALANCE W774 RJ45 for the control cabinet****Technical specifications**

Article number	<b>6GK5774-1FX00-0AA0</b> 6GK5774-1FX00-0AB0 <sup>1)</sup> 6GK5774-1FX00-0AC0 <sup>2)</sup>
Product type designation	W774-1 RJ45
<b>Standards, specifications, approvals</b>	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for safety from CSA and UL	UL 60950-1, CSA C22.2 No. 60950-1
Certificate of suitability	
• EC Declaration of Conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Railway application in accordance with EN 50121-4	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes

Article number	<b>6GK5774-1FX00-0AA0</b> 6GK5774-1FX00-0AB0 <sup>1)</sup> 6GK5774-1FX00-0AC0 <sup>2)</sup>
Product type designation	W774-1 RJ45
Wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">http://www.siemens.com/wireless-approvals</a>
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• French marine classification society (BV)	Yes
• DNV GL	Yes
• Korean Register of Shipping (KRS)	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
• Polski Rejestr Statkow (PRS)	Yes
• Royal Institution of Naval Architects (RINA)	Yes
<b>Accessories</b>	
Accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA<sup>2)</sup> Wireless approval in the Israel

## Overview



- Client modules in SIMATIC S7-1500 design are suitable for applications where the device is to be mounted in the control cabinet

ET 200MP station with SCALANCE W734 RJ45

## Ordering data

### SCALANCE W734 Client Modules

IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbps; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20 °C to +60 °C); scope of supply: Mounting hardware; 4-pin screw terminal for 24 V DC; manual on CD-ROM; English/German

### SCALANCE W734-1 RJ45

For managing the radio link of up to eight devices with Industrial Ethernet connections;

- Country approvals for operation outside the USA
- Country approvals for operation within the USA <sup>1)</sup>

### Accessories

#### KEY-PLUG W740 iFeatures

Removable data storage medium for enabling additional iFeatures, for simple device replacement in the event of a fault, and for storing configuration data; can be used in SCALANCE W client modules with a PLUG slot.

#### C-PLUG

Removable data storage medium for simple device replacement in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with a PLUG slot

## Article No.

6GK5734-1FX00-0AA0

6GK5734-1FX00-0AB0

6GK5907-4PA00

6GK1900-0AB10

## Article No.

### IE FC RJ45 plug 180 2 x 2

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

### IE FC standard cable GP 2 x 2

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; package item max. 1 000 m, minimum order quantity 20 m

6XV1840-2AH10

### IE FC stripping tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

### Antennas and miscellaneous IWLAN accessories

See: Industry Mall, Industrial Wireless LAN/accessories

<sup>1)</sup> Please note country approvals under:  
<http://www.siemens.com/wireless-approvals>

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Communication

## SCALANCE W734 RJ45 for the control cabinet

### Technical specifications

Article number	<b>6GK5734-1FX00-0AA0</b> 6GK5734-1FX00-0AB0 <sup>1)</sup>
product type designation	W734-1 RJ45
<b>transfer rate</b>	
transfer rate	
• with WLAN maximum	300 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	100 Mbit/s
<b>interfaces</b>	
number of electrical connections	
• for network components or terminal equipment	2
• for power supply	1
• for redundant voltage supply	1
type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
<b>interfaces wireless</b>	
number of radio cards permanently installed	1
transmission mode for multiple input multiple output (MIMO)	2x2
number of spatial streams	2
number of electrical connections for external antenna(s)	2
type of electrical connection for external antenna(s)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1	
• from terminal block	19.2 V
supply voltage 2	
• from terminal block	28.8 V
supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
consumed current	
• at DC at 24 V typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
power loss [W]	
• at DC at 24 V typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W

Article number	<b>6GK5734-1FX00-0AA0</b> 6GK5734-1FX00-0AB0 <sup>1)</sup>
product type designation	W734-1 RJ45
<b>ambient conditions</b>	
ambient temperature	
• during operation	-20 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	95 %
ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
protection class IP	IP30
<b>design, dimensions and weights</b>	
width	26 mm
height	156 mm
depth	127 mm
width of the enclosure without antenna	26 mm
height of the enclosure without antenna	147 mm
depth of the enclosure without antenna	127 mm
net weight	0.52 kg
fastening method	wall mounting only if flat mounted
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	Yes
• 35 mm top hat DIN rail mounting	Yes
• wall mounting	Yes
<b>radio frequencies</b>	
operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals
<b>product features, product functions, product components general</b>	
product function Access Point Mode	No
product function client Mode	Yes
product function	
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
• iPCF-MC client	Yes; Only in combination with 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
number of iPCF-capable radio modules	1
product function iPRP	Yes; In combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures' only

<sup>1)</sup> Wireless approval in the USA



#### Technical specifications

Article number	<b>6GK5734-1FX00-0AA0</b> 6GK5734-1FX00-0AB0 <sup>1)</sup>
product type designation	W734-1 RJ45
<b>product functions management, configuration, engineering</b>	
number of manageable IP addresses in client	8
product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• WDS	No
protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
<b>product functions diagnostics</b>	
product function	
• PROFINET IO diagnosis	Yes
• link check	No
• connection monitoring IP-Alive	No
• SysLog	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>product functions VLAN</b>	
product function	
• function VLAN with IWLAN	No
<b>product functions DHCP</b>	
product function	
• DHCP client	Yes
• DHCP server	Yes
• DHCP Option 82	Yes
<b>product functions redundancy</b>	
protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
<b>product functions security</b>	
product function	
• ACL - MAC-based	Yes
• management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	Yes
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes

Article number	<b>6GK5734-1FX00-0AA0</b> 6GK5734-1FX00-0AB0 <sup>1)</sup>
product type designation	W734-1 RJ45
protocol is supported	
• SSH	Yes
• RADIUS	Yes
<b>product functions time</b>	
protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes
<b>standards, specifications, approvals</b>	
standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for safety from CSA and UL certificate of suitability	UL 60950-1, CSA C22.2 No. 60950-1
• EC Declaration of Conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• railway application in accordance with EN 50155	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">http://www.siemens.com/wireless-approvals</a>
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• French marine classification society (BV)	Yes
• DNV GL	Yes
• Korean Register of Shipping (KRS)	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
• Polski Rejestr Statkow (PRS)	Yes
• Royal Institution of Naval Architects (RINA)	Yes
<b>accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA

# SIMATIC S7-1500 Advanced Controllers

I/O modules

SIPLUS communication

## SIPLUS CM PtP

### Overview



- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 kbps
  - RS 232C, max. 115.2 kbps
  - RS 422/RS 485, max. 19.2 kbps
  - RS 422/RS 485, max. 115.2 kbps
- Protocols supported
  - Freeport: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU Master
  - Modbus RTU Slave
  - USS, implemented through instructions

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS CM PtP RS 232 BA communication module

(Extended temperature range and exposure to media)

Basic communication module with 1 interface RS 232, Freeport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 Kbps

6AG1540-1AD00-7AA0

#### SIPLUS CM PtP RS 232 HF communication module

(Extended temperature range and exposure to media)

High Feature communication module with 1 interface RS 232, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 Kbps

6AG1541-1AD00-7AB0

#### SIPLUS CM PtP RS 422/485 BA communication module

(Extended temperature range and exposure to media)

Basic communication module with 1 interface RS 422/485, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 Kbps

6AG1540-1AB00-7AA0

#### SIPLUS CM PtP RS 422/485 HF communication module

(Extended temperature range and exposure to media)

High Feature communication module with 1 interface RS 422/485, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 Kbps

6AG1541-1AB00-7AB0

#### Accessories

See SIMATIC S7-1500, CM PtP communication module, page 4/155

### Technical specifications

Article number	6AG1540-1AD00-7AA0	6AG1541-1AD00-7AB0	6AG1540-1AB00-7AA0	6AG1541-1AB00-7AB0
Based on	6ES7540-1AD00-0AA0 SIPLUS S7-1500 CM PtP RS232 BA	6ES7541-1AD00-0AB0 SIPLUS S7-1500 CM PtP RS232 HF	6ES7540-1AB00-0AA0 SIPLUS S7-1500 CM PtP RS422/485 BA	6ES7541-1AB00-0AB0 SIPLUS S7-1500 CM PtP RS422/485 HF
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

### Technical specifications

Article number	6AG1540-1AD00-7AA0	6AG1541-1AD00-7AB0	6AG1540-1AB00-7AA0	6AG1541-1AB00-7AB0
Based on	6ES7540-1AD00-0AA0 SIPLUS S7-1500 CM PtP RS232 BA	6ES7541-1AD00-0AB0 SIPLUS S7-1500 CM PtP RS232 HF	6ES7540-1AB00-0AA0 SIPLUS S7-1500 CM PtP RS422/485 BA	6ES7541-1AB00-0AB0 SIPLUS S7-1500 CM PtP RS422/485 HF
<b>Relative humidity</b>				
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A

**SIMATIC S7-1500 Advanced Controllers**

I/O modules

SIPLUS communication

**SIPLUS NET CM 1542-5****Overview**

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

The CM 1542-5 communication module expands the SIMATIC S7-1500 Controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module can also be used to implement separate PROFIBUS lines, in other words, to control a number of different field devices via a number of PROFIBUS segments. The CM 1542-5 handles all communication tasks, thus reducing the CPU load.

Apart from classic PROFIBUS communication, the CM 1542-5 is also suitable for S7 communication. This makes it possible to establish communication between the S7-1500 Controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting a SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)
- Communications services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS CM 1542-5 communication module**

(extended temperature range and medial exposure)

Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as a DP master or DP slave

**6AG1542-5DX00-7XE0****Accessories**

See SIMATIC S7-1500, CM 1542-5 communication module, page 4/160

## Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●	●	●	●

The SIMATIC CP 1543-1 communications processor securely connects the new SIMATIC S7-1500 Controller to Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols such as FTPS and SNMPv3, the communications processor protects individual S7-1500 stations or even entire automation cells against unauthorized access.

The CP can also be used for linking the S7-1500 station into an IPv6-based network. All functions are configured by means of STEP 7 Professional V12 (TIA Portal) or higher.

The CP 1543-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
- Security functions
  - Stateful Packet Inspection (layers 3 and 4) firewall
  - Secure communication via VPN (IPsec)
  - Secure access to the Web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
- Integration of an S7-1500 into IPv6-based networks; An IPv6-compliant IP address can be used for the following communication services:
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing by program block
  - Email transfer with addressing by program block

## Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS NET CP 1543-1  
communications processor****6AG1543-1AX00-2XE0**

(Extended temperature range and exposure to media)

For connection of SIMATIC S7-1500 to Industrial Ethernet via TCP/IP, ISO and UDP and Security functions; 1 x RJ45 interface with 10/100/1000 Mbps; electronic manual on DVD

**Accessories**

See SIMATIC S7-1500, SIMATIC CP 1543-1 communications processor, page 4/167

## SIMATIC S7-1500 Advanced Controllers

I/O modules

Connection system

### Front connectors

#### Overview



- Uniform, 40-pin front connector, suitable for SIMATIC S7-1500 I/O modules
- Versions for 25 mm wide or 35 mm wide modules
- With screw-type or push-in terminals
- Connectable core cross-sections: 0.25 mm<sup>2</sup> to 1.5 mm<sup>2</sup> (AWG 24 to 16)
- Front connector for 35 mm modules to be ordered separately; front connector for 25 mm modules included in scope of supply of modules

#### Design

- 40 terminals, arranged in two rows, numbered consecutively from 1 to 40
- Direct assignment of terminal to LED and labeling simplifies wiring, commissioning, and troubleshooting
- Holders for four potential bridges for simple and flexible creation of potential groups; four units are supplied with the front connector (optionally available as spare parts in packs of 20)
- Integrated shielding concept for analog modules and technology modules; allows space-saving installation without tools and ensures high ruggedness and EMC stability; components supplied with analog modules
- Cable ties for mechanical fixing of the cable bundle and for strain relief; 1 unit supplied with front connector

#### Ordering data

#### Article No.

##### Front connectors

For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin

- Screw terminals
- Push-in

**6ES7592-1AM00-0XB0**

**6ES7592-1BM00-0XB0**

For 25 mm modules; including cable ties and individual labeling strips; push-in, 40-pin; spare part

**6ES7592-1BM00-0XA0**

##### Potential bridges for front connectors

**6ES7592-3AA00-0AA0**

For 35 mm modules; 20 pieces; spare part

**Overview**

With two cabling systems, SIMATIC TOP connect ensures efficient wiring of the input and output module of the SIMATIC S7-1500 (35 mm unit): Fully modular connection for fast and clearly arranged connecting to sensors and actuators in the field, and flexible connection for simple wiring inside the control cabinet.

With the TIA Selection Tool, you can select suitable system cabling for the individual I/O modules with a simple mouse click. Suitable components for the respective I/O module are always offered. These can be transferred to the order list and then ordered in the Industry Mall.

Further information can be found on the Internet at

<http://www.siemens.com/tia-selection-tool>

4

**Design**

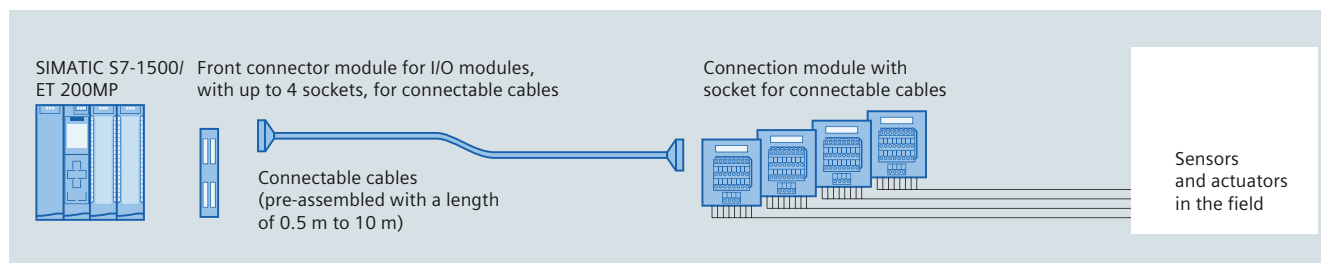
Two cabling variants are available for a wide range of control cabinet concepts:

**Fully modular connection**

The system consists of:

- Front connector module
- Connecting cable
- Terminal modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is significantly reduced. Systematic connection of the SIMATIC system. The assembly overhead for the connecting cables is drastically reduced thanks to the use of pre-assembled cables sold by the meter.



SIMATIC TOP connect for S7-1500/ET 200MP, fully modular connection

**Flexible connection**

Flexible connection with front connectors is available with 20 (Pin1 – 20) or 40 wired single cores.

These are available in lengths from 2.5 m to 10.0 m.

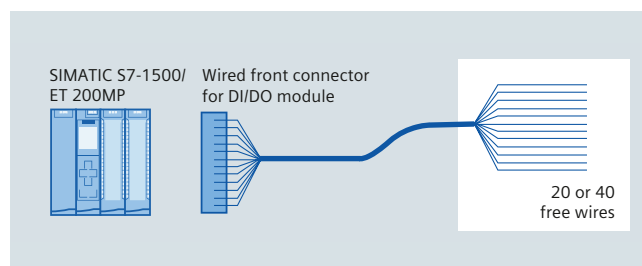
The single cores are available in different versions:

- Wire type H05V-K is used for industrial applications
- The UL/CSA-approved core is available for export to North America
- The halogen-free version is used where low smoke gas density in the event of fire is required, e.g. in building automation

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50% for assembly, since the single cores that have already been checked on the connector are fixed.

Thus no complex pre-assembly of up to two times 20 single cores per module is necessary.



SIMATIC TOP connect for S7-1500/ET 200MP, flexible connection

## SIMATIC S7-1500 Advanced Controllers

I/O modules

Connection system

### System cabling for SIMATIC S7-1500 and ET 200MP > Fully modular connection

#### Overview



The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-1500 or ET 200MP (35 mm design) consists of modified front connectors, called front connector modules, pre-assembled connecting cables of various lengths, and terminal modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The terminal modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

#### Benefits

- Front connector module, connecting cable and terminal module are easy to plug in
- Fast, low-cost wiring
- In the case of digital signals, the supply voltage can be connected to the front connector module or the terminal module
- Reduction in wiring errors, clear control cabinet wiring
- Byte-by-byte, or four-byte distribution of the signals in the case of digital signals
- Each component can be replaced individually
- Use of pre-assembled cables possible

#### Design

##### Front connector module

Modified front connectors, called front connector modules, are available for connecting to the I/O modules (35 mm design). These are plugged into the I/O module to be wired instead of the front connector. The front connector modules are available in many different versions for digital I/O modules, analog I/O modules and for the 24 V, 2-ampère module. The connecting cables are plugged into these front connector modules.

##### Connecting cable

There are different versions of the connecting cable.

As a pre-assembled 16-pin or 50-pin round cable (shielded or unshielded) it is available in lengths up to 10 m.

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The connecting cable connects the front connector module with the terminal module.

As a pre-assembled round cable (unshielded) with a 40-pin plug on the side of the I/O module (64-channel) and a 50-pin plug for the connection to the terminal module (4-byte version). The cable connectors are insulation displacement connectors.

##### Terminal module

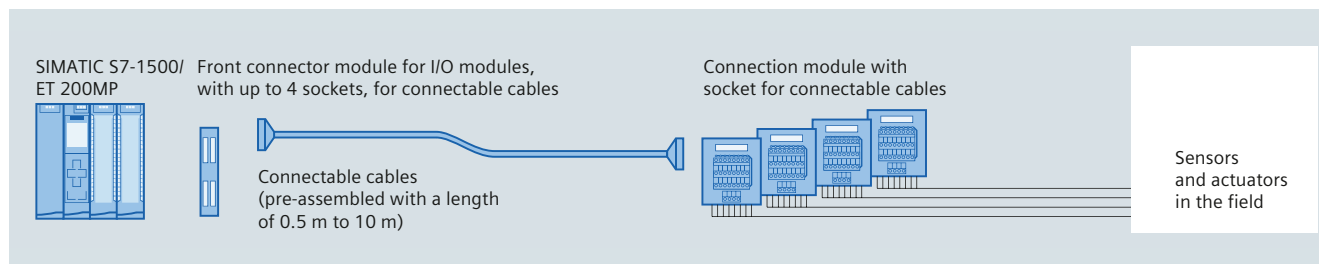
The system has both digital and analog terminal modules for connecting the I/O signals. These are snapped onto the DIN rail. The terminal modules with basic or signal functionality are available in 1-byte or 4-byte versions.

Terminal modules are available for two different connection methods: with push-in or screw-type terminals. The potential can be fed in at the terminal module or at the front connector module.

If other voltage or power levels are required in the field, the terminal module for TPRo or TPOo output signals is used. For the TPRo terminal module, relays are used for the implementation. For the TPOo terminal module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC or 110 V AC input signals have to be transmitted to the controller in the field, a terminal module with relay TPRI is available that simply converts the 230/110 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

##### Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay terminal module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency.



SIMATIC TOP connect for S7-1500/ET 200MP, fully modular connection



## Ordering data

## Article No.

## Article No.

**Front connector modules <sup>1)</sup>****Front connector module for digital modules for the connection of 16-pin connecting cables**

Power supply via

- Push-in
- Screw terminals

6ES7921-5AH20-0AA0  
6ES7921-5AB20-0AA0

**Front connector module for digital modules for the connection of 50-pin connecting cables**

Power supply via

- Push-in
- Screw terminals

6ES7921-5CH20-0AA0  
6ES7921-5CB20-0AA0

**Front connector module for 2 A digital modules for the connection of 16-pin connecting cables**

Power supply via

- Push-in
- Screw terminals

6ES7921-5AJ00-0AA0  
6ES7921-5AD00-0AA0

**Front connector module for analog modules for the connection of 16-pin connecting cables**

6ES7921-5AK20-0AA0

**Front connector module for analog modules for the connection of 50-pin connecting cables**

6ES7921-5CK20-0AA0

<sup>1)</sup> The terminal assignment of these front connector modules is unique and the dimensional drawings are shown in the equipment manual of SIMATIC TOP connect for S7-1500 and ET 200MP. The equipment manual is available as a download from Customer Support with the following ID: 95924607.

**Connecting cables****Connecting cables for SIMATIC S7-1500****Pre-assembled round cable**16-pin, 0.14 mm<sup>2</sup>

Unshielded

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-0BA50-0CB0  
6ES7923-0BB00-0CB0  
6ES7923-0BB50-0CB0  
6ES7923-0BC00-0CB0  
6ES7923-0BC50-0CB0  
6ES7923-0BD00-0CB0  
6ES7923-0BE00-0CB0  
6ES7923-0BF00-0CB0  
6ES7923-0BG50-0CB0  
6ES7923-0BJ00-0CB0  
6ES7923-0CB00-0CB0

Shielded

- 1.0 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-0BB00-0DB0  
6ES7923-0BC00-0DB0  
6ES7923-0BC50-0DB0  
6ES7923-0BD00-0DB0  
6ES7923-0BE00-0DB0  
6ES7923-0BF00-0DB0  
6ES7923-0BG50-0DB0  
6ES7923-0BJ00-0DB0  
6ES7923-0CB00-0DB0

Version 4 x 16 to 1 x 50-pin, 0.14 mm<sup>2</sup>

Unshielded

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-5BA50-0EB0  
6ES7923-5BB00-0EB0  
6ES7923-5BB50-0EB0  
6ES7923-5BC00-0EB0  
6ES7923-5BC50-0EB0  
6ES7923-5BD00-0EB0  
6ES7923-5BE00-0EB0  
6ES7923-5BF00-0EB0  
6ES7923-5BG50-0EB0  
6ES7923-5BJ00-0EB0  
6ES7923-5CB00-0EB0

50-pin, 0.14 mm<sup>2</sup>

Unshielded

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-5BA50-0CB0  
6ES7923-5BB00-0CB0  
6ES7923-5BB50-0CB0  
6ES7923-5BC00-0CB0  
6ES7923-5BC50-0CB0  
6ES7923-5BD00-0CB0  
6ES7923-5BE00-0CB0  
6ES7923-5BF00-0CB0  
6ES7923-5BG50-0CB0  
6ES7923-5BJ00-0CB0  
6ES7923-5CB00-0CB0

Shielded

- 1.0 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-5BB00-0DB0  
6ES7923-5BC00-0DB0  
6ES7923-5BC50-0DB0  
6ES7923-5BD00-0DB0  
6ES7923-5BE00-0DB0  
6ES7923-5BF00-0DB0  
6ES7923-5BG50-0DB0  
6ES7923-5BJ00-0DB0  
6ES7923-5CB00-0DB0

Version 1 x 40-pin to 1 x 50-pin, 0.14 mm<sup>2</sup>

Unshielded

- 1.0 m
- 2.0 m
- 2.5 m
- 3.0 m

6ES7923-5BB00-0GB0  
6ES7923-5BC00-0GB0  
6ES7923-5BC50-0GB0  
6ES7923-5BD00-0GB0

# SIMATIC S7-1500 Advanced Controllers

## I/O modules

### Connection system

#### System cabling for SIMATIC S7-1500 and ET 200MP > Fully modular connection

#### Ordering data

Article No.

Article No.

#### Terminal modules

##### Terminal module TP1

For 1-wire connection, for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0AA20-0AC0  
6ES7924-0AA20-0AA0  
6ES7924-0AA20-0BC0  
6ES7924-0AA20-0BA0

For 1-wire connection, for 50-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs
- Push-in terminals, sourcing input, with LEDs
- Screw-type terminals, sourcing input, with LEDs
- Push-in terminals, mid-point conductor signal, with LEDs
- Screw-type terminals, mid-point conductor signal, with LEDs

6ES7924-2AA20-0AC0  
6ES7924-2AA20-0AA0  
6ES7924-2AA20-0BC0  
6ES7924-2AA20-0BA0  
6ES7924-2AK20-0BC0  
6ES7924-2AK20-0BA0  
6ES7924-2AM20-0BC0  
6ES7924-2AM20-0BA0

##### Terminal module TP3

For 3-wire connection, for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs
- Push-in terminals with LEDs and one isolating terminal per channel
- Screw-type terminals with LEDs and one isolating terminal per channel
- Push-in terminals with LEDs and fuse per channel
- Screw-type terminals with LEDs and one fuse per channel

6ES7924-0CA20-0AC0  
6ES7924-0CA20-0AA0  
6ES7924-0CA20-0BC0  
6ES7924-0CA20-0BA0  
6ES7924-0CH20-0BC0  
6ES7924-0CH20-0BA0  
6ES7924-0CL20-0BC0  
6ES7924-0CL20-0BA0

For 3-wire connection, for 50-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-2CA20-0AC0  
6ES7924-2CA20-0AA0  
6ES7924-2CA20-0BC0  
6ES7924-2CA20-0BA0

##### Terminal module TPRo

Relay module for 8 outputs, relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BD20-0BC0  
6ES7924-0BD20-0BA0

##### Terminal module TPRI

Relay module for 8 outputs (110 V AC), relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BG20-0BC0  
6ES7924-0BG20-0BA0

##### Terminal module TPRI

Relay module for 8 outputs (230 V AC), relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BE20-0BC0  
6ES7924-0BE20-0BA0

##### Terminal module TPOo

Optocoupler module for 8 outputs (max. 24 V DC/4 A)

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BF20-0BC0  
6ES7924-0BF20-0BA0

##### Terminal module for digital output modules 2 A

Terminal module TP2

- Push-in terminals without LEDs
- Screw-type terminals without LEDs

6ES7924-0BB20-0AC0  
6ES7924-0BB20-0AA0

##### Terminal module for analog modules

Terminal module TPA, 16-pin

- Push-in terminals without LEDs
- Screw-type terminals without LEDs

6ES7924-0CC20-0AC0  
6ES7924-0CC20-0AA0

Terminal module TPA, 50-pin

- Push-in terminals without LEDs
- Screw-type terminals without LEDs

6ES7924-2CC20-0AC0  
6ES7924-2CC20-0AA0

##### Accessories

##### Equipment labeling plates for terminal modules in S7-1500 design

Equipment labeling plates, insertable  
P. unit = 340 units

3RT1900-1SB20

##### Shield plate for analog terminal module

P. unit = 4 units (for connection of 15-pin connecting cable)

6ES7928-1AA20-4AA0

P. unit = 4 units (for connection of 15-pin connecting cable)

6ES7928-1BA20-4AA0

##### Shield connection clamp

For shield plate at SIMATIC end,  
P. unit = 10 units

6ES7590-5BA00-0AA0

For shield plate at field end,  
2 x 2 ... 6 mm

6ES7390-5AB00-0AA0

For shield plate at field end,  
3 ... 8 mm

6ES7390-5BA00-0AA0

For shield plate at field end,  
4 ... 13 mm

6ES7390-5CA00-0AA0

**Technical specifications Front connector modules**

Rated operating voltage	<b>24 V DC</b>
Max. permissible operating voltage	60 V DC
Max. permissible continuous current • per connector pin	1 A
Max. permissible total current	2 A/byte
Permissible ambient temperature	0 to +60 °C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Clearance and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2

**Wiring rules for the front connector modules****SIMATIC TOP connect front connector module,  
connection for potential infeed**

	Push-in	Screw terminals
	<b>Modules up to 4 connections</b>	
Connectable cable cross-sections		
• Solid conductors	No	
• Flexible cables with/without wire end ferrule	0.25 to 1.5 mm <sup>2</sup>	
Number of cables per connection	1 or a combination of 2 wires up to 1.5 mm <sup>2</sup> (total) in a common wire end ferrule	
Max. diameter of the cable insulation	3.1 mm	
Stripped length of the cables		
• Without insulating collar	6 mm	
• With insulating collar	-	
Wire end ferrules according to DIN 46228		
• Without insulating collar	Form A; 5 to 7 mm long	
• with insulating collar 0.25 to 1.0 mm <sup>2</sup>	-	
• with insulating collar 1.5 mm <sup>2</sup>	-	
Blade width of the screwdriver	3.5 mm (cylindrical design)	
Tightening torque for connecting the cables	-	0.4 Nm to 0.7 Nm

**Technical specifications Connecting cable****Technical specifications of connecting cable from SIMATIC S7 to connection module**

Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. total current	4 A/byte
Operating temperature	0 to +60 °C
Outer diameter of pre-assembled round cable in mm unshielded/shielded (16-pole)	Approx. 6.5/7.0

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Connection system

## System cabling for SIMATIC S7-1500 and ET 200MP > Front connector with single wires

### Overview



The front connectors with single cores replace the SIMATIC standard connectors

- 6ES7592-1AM00-0XB0 and 6ES7592-1BM00-0XB0

### Technical specifications

Front connector with single cores for 16 channels (pins 1-20)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	20
Core cross-section	0.5 mm <sup>2</sup> ; Cu
Bundle diameter in mm	approx. 15
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw contacts

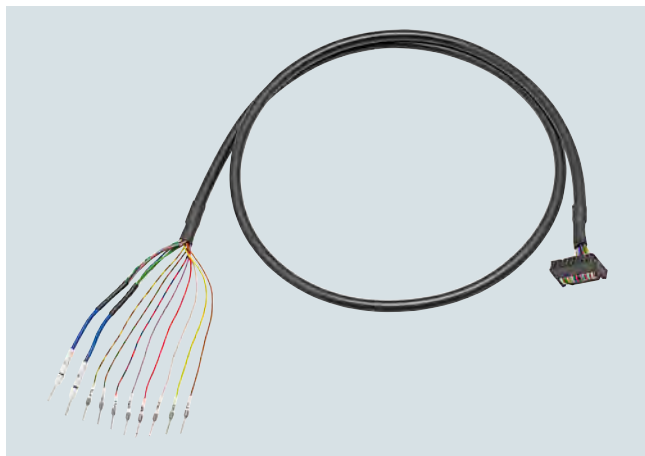
  

Front connector with single cores for 32 channels (pins 1-40)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	40
Core cross-section	0.5 mm <sup>2</sup> ; Cu
Bundle diameter in mm	approx. 17
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)
Assembly	Screw contacts

### Ordering data

### Article No.

Front connector with single cores for 32 channels (pins 1-40)	
<b>Core type H05V-K (0.5 mm<sup>2</sup> with screw connection)</b>	
• 2.5 m	6ES7922-5BC50-0AC0
• 3.2 m	6ES7922-5BD20-0AC0
• 5.0 m	6ES7922-5BF00-0AC0
• 6.5 m	6ES7922-5BG50-0AC0
• 8.0 m	6ES7922-5BJ00-0AC0
• 10.0 m	6ES7922-5CB00-0AC0
<b>Core type H05Z-K, halogen-free (0.5 mm<sup>2</sup> with screw connection)</b>	
• 2.5 m	6ES7922-5BC50-0HC0
• 3.2 m	6ES7922-5BD20-0HC0
• 5.0 m	6ES7922-5BF00-0HC0
• 6.5 m	6ES7922-5BG50-0HC0
• 8.0 m	6ES7922-5BJ00-0HC0
• 10.0 m	6ES7922-5CB00-0HC0
<b>Core type UL/CSA-certified (0.5 mm<sup>2</sup> with screw connection)</b>	
• 3.2 m	6ES7922-5BD20-0UC0
• 5.0 m	6ES7922-5BF00-0UC0
• 6.5 m	6ES7922-5BG50-0UC0
<b>Front connector with single cores for 16 channels (pins 1-20)</b>	
<b>Core type H05V-K (0.5 mm<sup>2</sup> with screw connection)</b>	
• 2.5 m	6ES7922-5BC50-0AB0
• 3.2 m	6ES7922-5BD20-0AB0
• 5.0 m	6ES7922-5BF00-0AB0
• 6.5 m	6ES7922-5BG50-0AB0
• 8.0 m	6ES7922-5BJ00-0AB0
• 10.0 m	6ES7922-5CB00-0AB0
<b>Core type H05Z-K, halogen-free (0.5 mm<sup>2</sup> with screw connection)</b>	
• 2.5 m	6ES7922-5BC50-0HB0
• 3.2 m	6ES7922-5BD20-0HB0
• 5.0 m	6ES7922-5BF00-0HB0
• 6.5 m	6ES7922-5BG50-0HB0
• 8.0 m	6ES7922-5BJ00-0HB0
• 10.0 m	6ES7922-5CB00-0HB0
<b>Core type UL/CSA-certified (0.5 mm<sup>2</sup> with screw connection)</b>	
• 3.2 m	6ES7922-5BD20-0UB0
• 5.0 m	6ES7922-5BF00-0UB0
• 6.5 m	6ES7922-5BG50-0UB0

**System cabling for SIMATIC S7-1500 IO (25 mm), ET 200SP, S7-1200 and LOGO!****Overview**

SIMATIC TOP connect universal connecting cable

The wiring of the

- SIMATIC S7-1500 IO (25 mm)
- SIMATIC ET 200SP
- SIMATIC S7-1200
- LOGO!

with the sensors/actuators is a significant factor with respect to time/cost overhead during configuration, control cabinet design, procurement and ease of servicing. The SIMATIC TOP connect system cabling makes connection easy, fast and secure.

4

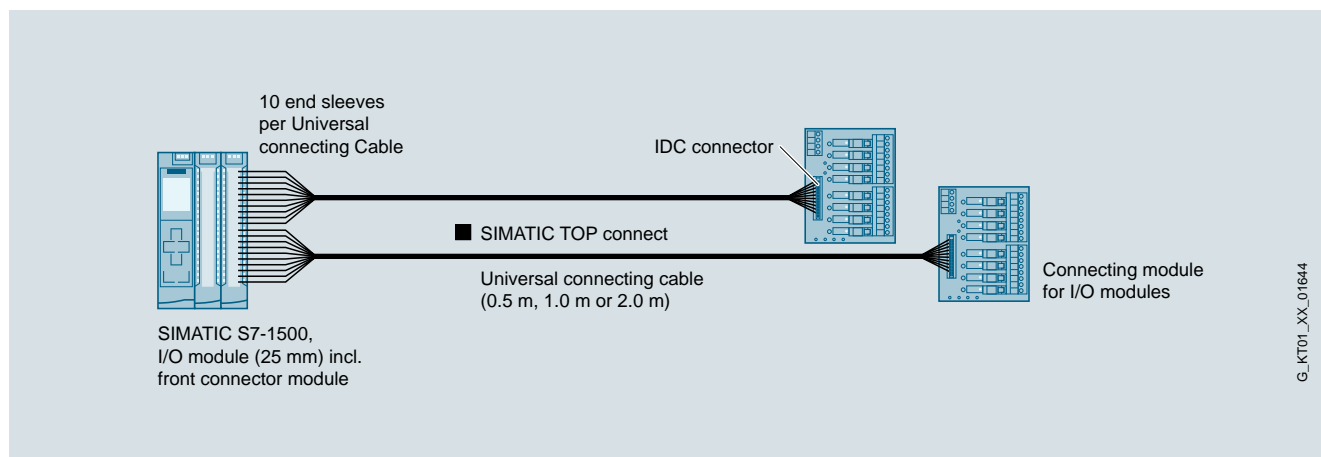
**Design**

The unshielded universal connection cable is offered for a wide range of control cabinet concepts.

It comprises:

- 16-pin round cable with a core diameter of 0.14 mm<sup>2</sup>, pre-assembled with wire end ferrules for connection to the controller:
  - labeled with "0" ... "7" for the control inputs/outputs
  - labeled with "M" for mass
  - labeled with "L+" for 24 V DC potential

- 16-pin IDC connector (insulation displacement) for connection to the SIMATIC TOP connect terminal modules for 8 I/Os:
  - 3-wire connection using the appropriate terminal module for quick, error-free, wiring
  - Galvanic isolation and adaptation using a coupling relay for easy implementation of potential groups in the system
  - High output current (up to 4 A), even for higher switching frequencies, using an optocoupler module (overload and short-circuit proof)
  - Implementation of isolating terminals using switch modules enabling individual signals to be measured
  - Channel-wise protection of I/Os using a fuse module with a thermal fuse



SIMATIC TOP connect universal connection cable

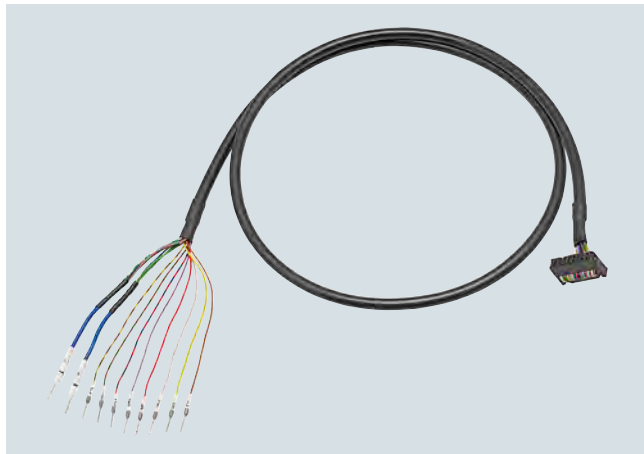
## SIMATIC S7-1500 Advanced Controllers

I/O modules

Connection system

### System cabling for SIMATIC S7-1500 IO (25 mm), ET 200SP, S7-1200 and LOGO!

#### Overview Universal connecting cable



SIMATIC TOP connect universal connecting cable

The universal connecting cable constitutes the link between the standard connection of the SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 or LOGO! and the SIMATIC TOP connect terminal module. It transmits 8 signals and the supply voltage. The connecting cable is available in lengths of 0.5 m / 1.0 m / 2.0 m. the maximum technically feasible length is 30 m.

#### Ordering data

#### Article No.

**Universal connecting cable for  
SIMATIC S7-1500 IO (25 mm),  
SIMATIC ET 200SP,  
SIMATIC S7-1200 and LOGO!**

**16 x 0.14 mm<sup>2</sup> unshielded**

- 0.5 m
- 1.0 m
- 2.0 m

**6ES7923-0BA50-0FB0**  
**6ES7923-0BB00-0FB0**  
**6ES7923-0BC00-0FB0**

#### Overview Terminal modules

The terminal modules are used instead of conventional terminal blocks and act as the interface between the controller and signals from the field. All digital modules with 8 I/Os can be used.

#### Ordering data

#### Article No.

##### Terminal module TP1

For 1-wire connection, for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0AA20-0AC0**  
**6ES7924-0AA20-0AA0**  
**6ES7924-0AA20-0BC0**  
**6ES7924-0AA20-0BA0**

##### Terminal module TP3

For 3-wire connection, for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs
- Push-in terminals with LEDs and one isolating terminal per channel
- Screw-type terminals with LEDs and one isolating terminal per channel
- Push-in terminals with LEDs and fuse per channel
- Screw-type terminals with LEDs and fuse per channel

**6ES7924-0CA20-0AC0**  
**6ES7924-0CA20-0AA0**  
**6ES7924-0CA20-0BC0**  
**6ES7924-0CA20-0BA0**  
**6ES7924-0CH20-0BC0**  
**6ES7924-0CH20-0BA0**  
**6ES7924-0CL20-0BC0**  
**6ES7924-0CL20-0BA0**

##### Terminal module TPRo

Relay module for 8 outputs, relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0BD20-0BC0**  
**6ES7924-0BD20-0BA0**

##### Terminal module TPRI

Relay module for 8 inputs (1230 V AC), relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0BE20-0BC0**  
**6ES7924-0BE20-0BA0**

##### Terminal module TPRI

Relay module for 8 inputs (110 V AC), relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0BG20-0BC0**  
**6ES7924-0BG20-0BA0**

##### Terminal module TPOo

Optocoupler module for 8 outputs (max. 24 V DC/4 A)

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-0BF20-0BC0**  
**6ES7924-0BF20-0BA0**

## Overview



Fail-safe digital input module: F-DI 16x24VDC PROFISAFE

## Important properties:

- 16-channel fail-safe digital input module for ET 200MP/S7-1500
- For fail-safe reading of sensor information (1 or 2-channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 4 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

## Ordering data

## Article No.

<b>F-digital input module</b> 16 inputs, 24 V DC, PROFISAFE	<b>6ES7526-1BH00-0AB0</b>
<b>Accessories</b>	
<b>Coding elements</b> E-coding element type F for ET 200MP module F-DI/F-DQ; 5 units, spare part	<b>6ES7592-6EF00-1AA0</b>
<b>Front connector</b> Incl. four potential bridges, cable ties and individual labeling strips, 40-pin • Screw terminals • Push-in	<b>6ES7592-1AM00-0XB0</b> <b>6ES7592-1BM00-0XB0</b>
<b>DIN A4 labeling sheets</b> For 35-mm F-modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, yellow	<b>6ES7592-2CX00-0AA0</b>
<b>U connector</b> 5 units; spare part	<b>6ES7590-0AA00-0AA0</b>
<b>Front door for F-I/O modules</b> 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	<b>6ES7528-0AA10-7AA0</b>

## Article No.

**STEP 7 Safety Advanced V17**

## Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

## Requirement:

STEP 7 Professional V17

## Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

**6ES7833-1FA17-0YA5**

Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery

**6ES7833-1FA17-0YH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Fail-safe I/O modules

## Digital F-input modules

### Ordering data

### Article No.

#### S7 Distributed Safety V5.4 SP5 Update 2 programming tool

##### Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

##### Requirement:

Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version

Floating license for 1 user; software and documentation on DVD; license key on USB flash drive

6ES7833-1FC02-0YA5

Floating license for 1 user; software, documentation and license key for download<sup>1)</sup>; Email address required for delivery

6ES7833-1FC02-0YH5

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	<b>6ES7526-1BH00-0AB0</b> ET 200MP, F-DI 16X24VDC
<b>General information</b>	
Product type designation	F-DI 16x24VDC
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 with HSP 0086
<b>Operating mode</b>	
• DI	Yes
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	4
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
<b>24 V encoder supply</b>	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Max. 100 mA when mounted vertically
<b>Digital inputs</b>	
Number of digital inputs	16
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
<b>Input current</b>	
• for signal "1", typ.	3.7 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- parameterizable	Yes

Article number	<b>6ES7526-1BH00-0AB0</b> ET 200MP, F-DI 16X24VDC
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	No
• Short-circuit	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	280 g



## Overview



Digital fail-safe digital output module:  
F-DQ 8x24VDC 2A PPM PROFISAFE

## Important properties:

- 8-channel digital fail-safe output module for ET 200MP/S7-1500
- Fail-safe 2-channel activation (parameterizable PM/PP switching) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The module supports PROFIsafe in both PROFIBUS and PROFINET configurations.
- Can be used with all fail-safe SIMATIC S7-1500 F-CPU's in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPU's.

## Ordering data

	Article No.
<b>F-digital output module</b> 8 outputs, 24 V DC, 2 A, PROFISAFE, p/m-switching	<b>6ES7526-2BF00-0AB0</b>
<b>Accessories</b>	
<b>Coding elements</b> E-coding element type F for ET 200MP module F-DI/F-DQ; 5 units, spare part	<b>6ES7592-6EF00-1AA0</b>
<b>Front connector</b> Incl. four potential bridges, cable ties and individual labeling strips, 40-pin • Screw terminals • Push-in	<b>6ES7592-1AM00-0XB0</b> <b>6ES7592-1BM00-0XB0</b>
<b>DIN A4 labeling sheets</b> For 35-mm F-modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, yellow	<b>6ES7592-2CX00-0AA0</b>
<b>U connector</b> 5 units; spare part	<b>6ES7590-0AA00-0AA0</b>
<b>Front door for F-I/O modules</b> 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	<b>6ES7528-0AA10-7AA0</b>

## Article No.

## STEP 7 Safety Advanced V17

## Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

## Requirement:

STEP 7 Professional V17

## Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

**6ES7833-1FA17-0YA5**

Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery

**6ES7833-1FA17-0YH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-1500 Advanced Controllers

I/O modules

Fail-safe I/O modules

## Digital F-output modules

### Ordering data

### Article No.

#### S7 Distributed Safety V5.4 SP5 Update 2 programming tool

##### Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

##### Requirement:

Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version

Floating license for 1 user; software and documentation on DVD; license key on USB flash drive

Floating license for 1 user; software, documentation and license key for download<sup>1)</sup>; Email address required for delivery

6ES7833-1FC02-0YA5

6ES7833-1FC02-0YH5

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	<b>6ES7526-2BF00-0AB0</b> ET 200MP, F-DQ 8x24VDC 2A PPM
<b>General information</b>	
Product type designation	F-DQ 8x24VDC/2A PPM
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 with HSP 0086
<b>Operating mode</b>	
• DQ	Yes
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Digital outputs</b>	
Number of digital outputs	8
Current-sinking	Yes
Current-sourcing	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	PM-switching: -24 V + (-47 V), PP-switching: -24 V
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	2 A
• on lamp load, max.	10 W
<b>Load resistance range</b>	
• lower limit	12 Ω
• upper limit	2 000 Ω
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal *1*, min.	24 V; L+ (-0.5 V)
<b>Output current</b>	
• for signal *1* rated value	2 A
• for signal *0* residual current, max.	0.5 mA; Current-sourcing, or current sourcing and sinking switches individually, current sinking: max. 1 mA

Article number	<b>6ES7526-2BF00-0AB0</b> ET 200MP, F-DQ 8x24VDC 2A PPM
<b>Switching frequency</b>	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per channel, max.	2 A
<b>Total current of the outputs (per module)</b>	
<b>horizontal installation</b>	
- up to 40 °C, max.	16 A
- up to 60 °C, max.	8 A
<b>vertical installation</b>	
- up to 40 °C, max.	8 A
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
Substitute values connectable	No
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	300 g

# SIMATIC S7-1500 Advanced Controllers

## I/O modules

### SIPLUS F-digital/analog modules

#### SIPLUS digital F-input modules

### Overview



SIPLUS digital fail-safe input module: F-DI 16x24 V DC

#### Important properties:

- 16-channel fail-safe digital input module for ET 200MP/S7-1500
- For fail-safe reading of sensor information (1 or 2-channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 4 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

#### Article No.

SIPLUS F-digital input module	Article No.
16 inputs, 24 V DC, PROFISAFE	<b>6AG1526-1BH00-2AB0</b>
<b>Accessories</b>	
<b>Coding elements</b>	<b>6AG1592-6EF00-2AA0</b>
E-coding element type F for SIPLUS ET 200MP modules F-DI/F-DQ; 5 units, spare part	
<b>Other accessories</b>	See SIMATIC S7-1500 F-digital input modules, page 4/197

### Technical specifications

Article number	<b>6AG1526-1BH00-2AB0</b>
Based on	<b>6ES7526-1BH00-0AB0</b> SIPLUS S7-1500 F-DI 16x24VDC
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

# SIMATIC S7-1500 Advanced Controllers

I/O modules

SIPLUS F-digital/analog modules

## SIPLUS digital F-output modules

### Overview



SIPLUS digital fail-safe output module:  
F-DQ 8x24 V DC 2 A PPM

Important properties:

- 8-channel digital fail-safe output module for ET 200MP/S7-1500
- Fail-safe 2-channel activation (parameterizable PM/PP switching) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The module supports PROFIsafe in both PROFIBUS and PROFINET configurations.
- Can be used with all fail-safe SIMATIC S7-1500 F-CPU's in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPU's.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS F-digital output module

8 outputs, 24 V DC, 2 A, PROFISAFE, p/m-switching

**6AG1526-2BF00-2AB0**

#### Accessories

E-coding element type F for SIPLUS ET 200MP modules F-DI/F-DQ; 5 units, spare part

**6AG1592-6EF00-2AA0**

#### Other accessories

See SIMATIC S7-1500 F-digital output modules, page 4/199

### Technical specifications

Article number	<b>6AG1526-2BF00-2AB0</b>
Based on	<b>6ES7526-2BF00-0AB0</b> SIPLUS S7-1500 F-DQ 8x24VDC/2A
<b>General information</b>	
Product type designation	F-DQ 8x24VDC/2A PPM
<b>Operating mode</b>	
• DQ	Yes
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Digital outputs</b>	
Number of digital outputs	8
Current-sinking	Yes
Current-sourcing	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	PM-switching: -24 V + (-47 V), PP-switching: -24 V
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	2 A
• on lamp load, max.	10 W
<b>Load resistance range</b>	
• lower limit	12 Ω
• upper limit	2 000 Ω
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "1", min.	24 V; L+ (-0.5 V)
<b>Output current</b>	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA; Current-sourcing, or current sourcing and sinking switches individually, current sinking: max. 1 mA
<b>Switching frequency</b>	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per channel, max.	2 A
<b>Total current of the outputs (per module)</b>	
<b>horizontal installation</b>	
- up to 40 °C, max.	16 A
- up to 60 °C, max.	8 A
<b>vertical installation</b>	
- up to 40 °C, max.	8 A
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	No
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes

#### Technical specifications

Article number	<b>6AG1526-2BF00-2AB0</b>
Based on	<b>6ES7526-2BF00-0AB0</b> SIPLUS S7-1500 F-DQ 8x24VDC/2A
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1526-2BF00-2AB0</b>
Based on	<b>6ES7526-2BF00-0AB0</b> SIPLUS S7-1500 F-DQ 8x24VDC/2A
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	300 g

# SIMATIC S7-1500 Advanced Controllers

## Power supplies

### 1-phase, DC 24 V (for S7-1500 and ET 200MP)

#### Overview



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

#### Ordering data

#### Article No.

<b>SIMATIC PM 1507</b> Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A	<b>6EP1332-4BA00</b>
<b>SIMATIC PM 1507</b> Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	<b>6EP1333-4BA00</b>
<b>Accessories</b>	
<b>Power plug</b> With coding element for power supply module; spare part, 10 units per packing unit	<b>6ES7590-8AA00-0AA0</b>
<b>Top hat DIN rail adapter</b> For adapting S7-1500 DIN rails on low or flat top hat DIN rails, as pre-assembled in control cabinets and terminal boxes, for example. An adapter must be positioned every 25 cm. Including mounting hardware. 10 units per packing unit	<b>6ES7590-6AA00-0AA0</b>

#### Technical specifications

Article number	<b>6EP1332-4BA00</b>	<b>6EP1333-4BA00</b>
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
<b>Input</b>		
Input	1-phase AC	1-phase AC
• Note	Automatic range selection	Automatic range selection
supply voltage		
• 1 at AC rated value	120 V	120 V
• 2 at AC rated value	230 V	230 V
input voltage		
• 1 at AC	85 ... 132 V	85 ... 132 V
• 2 at AC	170 ... 264 V	170 ... 264 V
Wide-range input	No	No
Overvoltage resistance	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms
Mains buffering	at Vin = 93/187 V	at Vin = 93/187 V
Mains buffering at Iout rated, min.	20 ms; at Vin = 93/187 V	20 ms; at Vin = 93/187 V
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range	45 ... 65 Hz	45 ... 65 Hz
input current		
• at rated input voltage 120 V	1.4 A	3.7 A
• at rated input voltage 230 V	0.8 A	1.7 A
Switch-on current limiting (+25 °C), max.	23 A	62 A
duration of inrush current limiting at 25 °C		
• maximum	3 ms	3 ms
I <sup>2</sup> t, max.	1.3 A <sup>2</sup> ·s	12 A <sup>2</sup> ·s
Built-in incoming fuse	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 10 A characteristic B or 6 A characteristic C	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

### Technical specifications

Article number	6EP1332-4BA00	6EP1333-4BA00
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
<b>Output</b>		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out}$ DC	24 V	24 V
<ul style="list-style-type: none"> <li>output voltage at output 1 at DC rated value</li> </ul>	24 V	24 V
Total tolerance, static $\pm$	1 %	1 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	50 mV	50 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	150 mV	150 mV
product function output voltage adjustable	No	No
Status display	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	1.5 s	1.5 s
Voltage rise, typ.	10 ms	10 ms
Rated current value $I_{out}$ rated	3 A	8 A
Current range	0 ... 3 A	0 ... 8 A
supplied active power typical	72 W	192 W
short-term overload current		
<ul style="list-style-type: none"> <li>on short-circuiting during the start-up typical</li> </ul>	12 A	35 A
<ul style="list-style-type: none"> <li>at short-circuit during operation typical</li> </ul>	12 A	35 A
duration of overloading capability for excess current		
<ul style="list-style-type: none"> <li>on short-circuiting during the start-up</li> </ul>	70 ms	70 ms
<ul style="list-style-type: none"> <li>at short-circuit during operation</li> </ul>	70 ms	70 ms
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
<b>Efficiency</b>		
Efficiency at $U_{out}$ rated, $I_{out}$ rated, approx.	87 %	90 %
Power loss at $U_{out}$ rated, $I_{out}$ rated, approx.	11 W	21 W
<b>Closed-loop control</b>		
Dynamic mains compensation ( $U_{in}$ rated $\pm 15$ %), max.	0.1 %	0.1 %
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %), $U_{out} \pm$ typ.	1 %	2 %
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %), $U_{out} \pm$ typ.	3 %	3 %
Load step setting time 10 to 90%, typ.	5 ms	5 ms
Load step setting time 90 to 10%, typ.	5 ms	5 ms
setting time maximum	5 ms	5 ms
<b>Protection and monitoring</b>		
Output overvoltage protection	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V
Current limitation	3.15 ... 3.6 A	8.4 ... 9.6 A
Current limitation, typ.	3.4 A	9 A
property of the output short-circuit proof	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
Overload/short-circuit indicator	-	-

# SIMATIC S7-1500 Advanced Controllers

## Power supplies

### 1-phase, DC 24 V (for S7-1500 and ET 200MP)

#### Technical specifications

Article number	<b>6EP1332-4BA00</b>	<b>6EP1333-4BA00</b>
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
<b>Safety</b>		
Primary/secondary isolation galvanic isolation	Yes	Yes
Protection class	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178 and EN 61131-2	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178 and EN 61131-2
leakage current	Class I	Class I
• maximum	3.5 mA	3.5 mA
• typical	0.4 mA	1.3 mA
Degree of protection (EN 60529)	IP20	IP20
<b>Approvals</b>		
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	IECEX Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	IECEX Ex nA nC IIC T3 Gc; ATEX (EX) II 3G Ex nA nC IIC T3 Gc; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T3, File E330455
certificate of suitability NEC Class 2	No	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
certificate of suitability EAC approval	Yes	Yes
Marine approval	ABS, BV, DNV GL	ABS, BV, DNV GL
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>environmental conditions</b>		
ambient temperature		
• during operation	0 ... 60 °C	0 ... 60 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>		
Connection technology	Screw-/spring clamp connection	Screw-/spring clamp connection
Connections		
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Output	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm <sup>2</sup>	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm <sup>2</sup>
product function		
• removable terminal at input	Yes	Yes
• removable terminal at output	Yes	Yes
width of the enclosure	50 mm	75 mm
height of the enclosure	147 mm	147 mm
depth of the enclosure	129 mm	129 mm
required spacing		
• top	40 mm	40 mm
• bottom	40 mm	40 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.45 kg	0.74 kg
product feature of the enclosure housing can be lined up	Yes	Yes
Installation	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail
MTBF at 40 °C	1 611 993 h	1 362 918 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)



### Overview



- System power supplies for SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Engineering and configuration via STEP 7 V12 and higher (PS 60W 24/48/60V DC HF: from STEP 7 V14 SP1)
- In addition with PS 60W 24/48/60V DC HF: Retentive storage of CPU work memory (data) for all S7-1500 CPUs

### Ordering data

### Article No.

#### Power supply

For supplying the backplane bus of the S7-1500 Controller

24 V DC input voltage, power 25 W

**6ES7505-0KA00-0AB0**

24/48/60 V DC input voltage, power 60 W

**6ES7505-0RA00-0AB0**

24/48/60 V DC input voltage, power 60 W, buffering functionality

**6ES7505-0RB00-0AB0**

120/230 V AC input voltage, power 60 W

**6ES7507-0RA00-0AB0**

#### Accessories

##### SIMATIC S7-1500 DIN rail

Fixed lengths, with grounding elements

- 160 mm
- 245 mm
- 482 mm
- 530 mm
- 830 mm

**6ES7590-1AB60-0AA0**  
**6ES7590-1AC40-0AA0**  
**6ES7590-1AE80-0AA0**  
**6ES7590-1AF30-0AA0**  
**6ES7590-1AJ30-0AA0**

For cutting to length by customer, without drill holes; grounding elements must be ordered separately

- 2000 mm

**6ES7590-1BC00-0AA0**

##### PE connection element for DIN rail 2000 mm

**6ES7590-5AA00-0AA0**

Spare part, 20 units

##### Power connector

**6ES7590-8AA00-0AA0**

With coding element for power supply module; spare part, 10 units

### Technical specifications

Article number	<b>6ES7505-0KA00-0AB0</b> S7-1500, PS 25W 24V DC	<b>6ES7505-0RA00-0AB0</b> S7-1500, PS 60W 24/48/60V DC	<b>6ES7505-0RB00-0AB0</b> S7-1500, PS 60W 24/48/60V DC HF	<b>6ES7507-0RA00-0AB0</b> S7-1500, PS 60W 120/230V AC/DC
<b>General information</b>				
Product type designation	PS 25W 24VDC	PS 60 W 24/48/60 V DC	PS 60 W 24/48/60 V DC HF	PS 60 W 120/230 V AC/DC
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	V12 / V12	V12 / V12	V14 SP1	V12 / V12
• STEP 7 configurable/integrated from version	V5.5 SP3 or higher	V5.5 SP3 or higher		V5.5 SP3 or higher
<b>Installation type/mounting</b>				
Rail mounting		Yes		Yes
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V / 48 V / 60 V	24 V / 48 V / 60 V	120 V / 230 V
Rated value (AC)				120 V / 230 V
Reverse polarity protection	Yes	Yes	Yes	
Short-circuit protection	Yes	Yes	Yes	Yes
<b>Line frequency</b>				
• Rated value 50 Hz				Yes
• permissible range, lower limit				47 Hz
• permissible range, upper limit				63 Hz
<b>Mains buffering</b>				
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	20 ms

# SIMATIC S7-1500 Advanced Controllers

## Power supplies

### System power supplies

#### Technical specifications

Article number	<b>6ES7505-0KA00-0AB0</b> S7-1500, PS 25W 24V DC	<b>6ES7505-0RA00-0AB0</b> S7-1500, PS 60W 24/48/60V DC	<b>6ES7505-0RB00-0AB0</b> S7-1500, PS 60W 24/48/60V DC HF	<b>6ES7507-0RA00-0AB0</b> S7-1500, PS 60W 120/230V AC/DC
<b>Input current</b>				
Rated value at 24 V DC	1.3 A	3 A	3 A	
Rated value at 48 V DC		1.5 A	1.5 A	
Rated value at 60 V DC		1.2 A	1.2 A	
Rated value at 120 V DC				0.6 A
Rated value at 230 V DC				0.3 A
Rated value at 120 V AC				0.6 A
Rated value at 230 V AC				0.34 A
Inrush current, max.			≤ 8 A for t ≤ 1 s	
<b>Output current</b>				
Short-circuit protection	Yes	Yes	Yes	Yes
<b>Power</b>				
Infeed power to the backplane bus	25 W	60 W	60 W	60 W
<b>Power loss</b>				
Power loss at nominal rating conditions	6.2 W	12 W	12 W	12 W
<b>Interrupts/diagnostics/ status information</b>				
Status indicator	Yes	Yes	Yes	Yes
<b>Potential separation</b>				
primary/secondary	Yes	Yes; Electrical isolation for 230 V AC (reinforced isolation)		Yes
<b>EMC</b>				
<b>Interference immunity against voltage surge</b>				
<ul style="list-style-type: none"> <li>Interference immunity on supply lines acc. to IEC 61000-4-5</li> </ul>	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required
<b>Degree and class of protection</b>				
Equipment protection class	III, with protective conductor	I, with protective conductor	I, with protective conductor	I, with protective conductor
<b>Altitude during operation relating to sea level</b>				
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual			
<b>Dimensions</b>				
Width	35 mm	70 mm	105 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>				
Weight, approx.	350 g	600 g	865 g	600 g

# SIMATIC S7-1500 Advanced Controllers

## SIPLUS power supplies

1-phase, 24 V DC (for S7-1500 and ET 200MP)

### Overview



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

#### Note:

SIPLUS extreme products are based on Siemens standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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SIPLUS S7-1500 PM 1507		
Article No.	6AG1332-4BA00-7AA0	6AG1333-4BA00-7AA0
Article number based on	6EP1332-4BA00	6EP1333-4BA00
Ambient temperature range	-40 ... +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical specifications	The technical specifications of the standard product apply, except for the ambient conditions.	
<b>Ambient conditions</b>		
Extended range of environmental conditions		
• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	
Relative humidity		
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)	
Resistance		
• to biologically active substances/compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.	
• to chemically active substances/compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.	
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.	

### Ordering data

#### SIPLUS S7-1500 PM 1507

(Extended temperature range and exposure to media)

Input 120/230 V AC,  
output 24 V DC, 3 A

Input 120/230 V AC,  
output 24 V DC, 8 A

#### Article No.

6AG1332-4BA00-7AA0

6AG1333-4BA00-7AA0

#### Article No.

#### Accessories

See PM 1507 power supply,  
page 4/204

## SIMATIC S7-1500 Advanced Controllers

### SIPLUS power supplies

#### SIPLUS system power supplies

#### Overview



- System power supplies for the SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Engineering and configuration via STEP 7 V12

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### SIPLUS S7-1500 system power supply

(Extended temperature range and exposure to media)

For supplying the backplane bus of the S7-1500 Controller

24 V DC input voltage, power 25 W

24/48/60 V DC input voltage, power 60 W

120/230 V AC input voltage, power 60 W

##### Accessories

**6AG1505-0KA00-7AB0**

**6AG1505-0RA00-7AB0**

**6AG1507-0RA00-7AB0**

See SIMATIC S7-1500, system power supplies, page 4/207

#### Technical specifications

Article number	<b>6AG1505-0KA00-7AB0</b>	<b>6AG1505-0RA00-7AB0</b>	<b>6AG1507-0RA00-7AB0</b>
Based on	<b>6ES7505-0KA00-0AB0</b> SIPLUS S7-1500 PS 1505 25W 24VDC	<b>6ES7505-0RA00-0AB0</b> SIPLUS S7-1500 PS 1505 60W 24VDC	<b>6ES7507-0RA00-0AB0</b> SIPLUS S7-1500 PS 1507 60W 230VAC
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; > +60 °C max. power input 30 W; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

### Technical specifications

Article number	6AG1505-0KA00-7AB0	6AG1505-0RA00-7AB0	6AG1507-0RA00-7AB0
Based on	6ES7505-0KA00-0AB0	6ES7505-0RA00-0AB0	6ES7507-0RA00-0AB0
	SIPLUS S7-1500 PS 1505 25W 24VDC	SIPLUS S7-1500 PS 1505 60W 24VDC	SIPLUS S7-1500 PS 1507 60W 230VAC
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## SIMATIC S7-1500 Advanced Controllers

Operator control and monitoring  
Basic Panels

### Standard devices 2nd Generation

#### Overview



#### Basic Panels (2<sup>nd</sup> Generation)

SIMATIC HMI Basic Panels (2<sup>nd</sup> Generation) with their fully developed HMI basic functions are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive as well as the manual backup and restoring of the complete panel.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

<http://www.siemens.com/basic-panels>

#### Ordering data

#### Article No.

##### SIMATIC HMI Basic Panels (2<sup>nd</sup> Generation)

##### Key and touch devices

##### SIMATIC HMI KTP400 Basic

Key/touch-screen operation;  
4" TFT widescreen display,  
65 536 colors, PROFINET interface

6AV2123-2DB03-0AX0

##### SIMATIC HMI TP400 Basic Keyless

Touch screen operation;  
4" TFT widescreen display,  
65 536 colors, PROFINET interface

6AV2143-6DB00-0AA0

##### SIMATIC HMI KTP700 Basic

Key/touch-screen operation;  
7" TFT display, 65 536 colors,  
PROFINET interface

6AV2123-2GB03-0AX0

##### SIMATIC HMI KTP700 Basic DP

Key/touch-screen operation;  
7" TFT display, 65 536 colors,  
PROFIBUS interface

6AV2123-2GA03-0AX0

##### SIMATIC HMI TP700 Basic Keyless

Touch screen operation;  
7" TFT display, 65 536 colors,  
PROFINET interface

6AV2143-6GB00-0AA0

##### SIMATIC HMI KTP900 Basic

Key/touch-screen operation;  
9" TFT display, 65 536 colors,  
PROFINET interface

6AV2123-2JB03-0AX0

##### SIMATIC HMI TP900 Basic Keyless

Touch screen operation;  
9" TFT display, 65 536 colors,  
PROFINET interface

6AV2143-6JB00-0AA0

##### SIMATIC HMI KTP1200 Basic

Key/touch-screen operation;  
12" TFT display, 65 536 colors,  
PROFINET interface

6AV2123-2MB03-0AX0

##### SIMATIC HMI KTP1200 Basic DP

Key/touch-screen operation;  
12" TFT display, 65 536 colors,  
PROFIBUS interface

6AV2123-2MA03-0AX0

#### Starter kits

##### Starter kit LOGO! + KP300 Basic mono PN

6AV2132-0HA00-0AA1

##### Starter kit LOGO! + KTP400 Basic

6AV2132-0KA00-0AA1

##### Starter kit LOGO! + KTP700 Basic

6AV2132-3GB00-0AA1

Starter kits with a LOGO! consist of:

- the respective SIMATIC HMI Basic Panel
- SIMATIC HMI KP300 Basic mono PN
- SIMATIC HMI KTP400 Basic
- SIMATIC HMI KTP700 Basic
- LOGO! 12/24 RCE
- LOGO! POWER 24 V 1,3 A
- LOGO! SOFT COMFORT V7
- WINCC BASIC (TIA Portal)
- Ethernet CAT5 cable, 2 m

#### Documentation

Additional information on the manual for the Basic Panels is available on the Internet at:

<http://support.automation.siemens.com>

#### Accessories

See catalog ST 80 / ST PC or Industry Mall

**Overview**

SIMATIC HMI MTP2200 Unified Comfort Panel Standard design front view

**SIMATIC HMI Unified Comfort Panels - standard devices**

The SIMATIC HMI Unified Comfort Panels consist of six different devices with varying display sizes.

All devices come with the same number of hardware interfaces and the same functionality – just select the perfect device for your needs based on the screen size.

Each Unified Comfort Panel is available in the standard design with Siemens and SIMATIC HMI branding and a silver-colored aluminum frame.

All Unified Comfort Panels come with integrated Edge functionality.

Siemens Industrial Edge can be used in two different ways:

- Device-managed Edge
- Centrally-managed Edge (planned)

SIMATIC HMI Unified Comfort Panels can also be ordered with a neutral design. Starter kits are available for standard design devices.

Note:

The technical specifications of the neutral design devices correspond to the technical specifications of the devices with standard design.

Ordering data	Article No.	Article No.
<b>SIMATIC HMI Unified Comfort Panels Touch Devices</b>		
<b>Standard design</b>		
<b>SIMATIC HMI MTP700 Unified Comfort</b> Touch operation; 7" widescreen display	6AV2128-3GB06-0AX0	<b>SIMATIC HMI MTP1900 Unified Comfort</b> Touch operation; 19" widescreen display
<b>SIMATIC HMI MTP1000 Unified Comfort</b> Touch operation; 10" widescreen display	6AV2128-3KB06-0AX0	<b>SIMATIC HMI MTP2200 Unified Comfort</b> Touch operation; 22" widescreen display
<b>SIMATIC HMI MTP1200 Unified Comfort</b> Touch operation; 12" widescreen display	6AV2128-3MB06-0AX0	<b>Starter kits</b>
<b>SIMATIC HMI MTP1500 Unified Comfort</b> Touch operation; 15" widescreen display	6AV2128-3QB06-0AX0	<b>Standard design</b>
<b>SIMATIC HMI MTP1900 Unified Comfort</b> Touch operation; 19" widescreen display	6AV2128-3UB06-0AX0	Each consisting of: • The corresponding Unified Comfort Panel • WinCC Unified Comfort (TIA Portal) • EDGE runtime license • Industrial Ethernet cable, for test purposes • SIMATIC SD Card Indoor 32 GB • 5 protective films
<b>SIMATIC HMI MTP2200 Unified Comfort</b> Touch operation; 22" widescreen display	6AV2128-3XB06-0AX0	<b>SIMATIC HMI MTP700 Unified Comfort</b>
<b>Neutral design</b>		<b>SIMATIC HMI MTP1000 Unified Comfort</b>
<b>SIMATIC HMI MTP700 Unified Comfort</b> Touch operation; 7" widescreen display	6AV2128-3GB36-0AX0	<b>SIMATIC HMI MTP1200 Unified Comfort</b>
<b>SIMATIC HMI MTP1000 Unified Comfort</b> Touch operation; 10" widescreen display	6AV2128-3KB36-0AX0	<b>SIMATIC HMI MTP1500 Unified Comfort</b>
<b>SIMATIC HMI MTP1200 Unified Comfort</b> Touch operation; 12" widescreen display	6AV2128-3MB36-0AX0	<b>SIMATIC HMI MTP1900 Unified Comfort</b>
<b>SIMATIC HMI MTP1500 Unified Comfort</b> Touch operation; 15" widescreen display	6AV2128-3QB36-0AX0	<b>SIMATIC HMI MTP2200 Unified Comfort</b>
		<b>Software</b>
		<b>EDGE Runtime for SIMATIC Unified Comfort</b>
		Runtime software, single license, license key for download, without software and documentation, class A, email address essential for delivery

## SIMATIC S7-1500 Advanced Controllers

Operator control and monitoring  
Comfort Panels

### Comfort Panels Standard devices

#### Overview



#### SIMATIC HMI Comfort Panels - Standard devices

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFlenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Data security in the event of a power failure for the device and for the SIMATIC HMI memory card
- Innovative service and commissioning concept
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- All versions can be used as an OPC UA client or as a server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal engineering framework

#### Note:

A 7" and a 15" Comfort Outdoor version are available. These devices have been specially designed for outdoor applications in difficult environments. Best display quality, even under sunlight, UV-resistant fronts and much more.

For more information, please go to:

<http://www.siemens.com/comfort-panels>

#### Ordering data

#### Article No.

<b>SIMATIC HMI Comfort Panels</b>	
<b>Key and touch devices</b>	
<b>SIMATIC HMI KTP400 Comfort</b> Key/touch-screen operation; 4" widescreen display	<b>6AV2124-2DC01-0AX0</b>
<b>Touch devices</b>	
<b>SIMATIC HMI TP700 Comfort</b> Touch-screen operation; 7" widescreen display	<b>6AV2124-0GC01-0AX0</b>
<b>SIMATIC HMI TP900 Comfort</b> Touch-screen operation; 9" widescreen display	<b>6AV2124-0JC01-0AX0</b>
<b>SIMATIC HMI TP1200 Comfort</b> Touch-screen operation; 12" widescreen display	<b>6AV2124-0MC01-0AX0</b>
<b>SIMATIC HMI TP1500 Comfort</b> Touch-screen operation; 15" widescreen display	<b>6AV2124-0QC02-0AX1</b>
<b>SIMATIC HMI TP1900 Comfort</b> Touch-screen operation; 19" widescreen display	<b>6AV2124-0UC02-0AX1</b>
<b>SIMATIC HMI TP2200 Comfort</b> Touch-screen operation; 22" widescreen display	<b>6AV2124-0XC02-0AX1</b>
<b>Key devices</b>	
<b>SIMATIC HMI KP400 Comfort</b> Key operation; 4" widescreen display	<b>6AV2124-1DC01-0AX0</b>
<b>SIMATIC HMI KP700 Comfort</b> Key operation; 7" widescreen display	<b>6AV2124-1GC01-0AX0</b>
<b>SIMATIC HMI KP900 Comfort</b> Key operation; 9" widescreen display	<b>6AV2124-1JC01-0AX0</b>
<b>SIMATIC HMI KP1200 Comfort</b> Key operation; 12" widescreen display	<b>6AV2124-1MC01-0AX0</b>
<b>SIMATIC HMI KP1500 Comfort</b> Key operation; 15" widescreen display	<b>6AV2124-1QC02-0AX1</b>
<b>Accessories</b>	See catalog ST 80 / ST PC or Industry Mall



### Overview



With their fully developed HMI basic functions, 2<sup>nd</sup> Generation SIPLUS Basic Panels are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Technical documentation on SIPLUS can be found here: <http://www.siemens.com/siplus-extreme>

### Ordering data

### Article No.

#### SIPLUS HMI Basic Panels, Key and Touch

##### SIPLUS HMI KTP400 Basic

6AG1123-2DB03-2AX0

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C

##### SIPLUS HMI KTP700 Basic

6AG1123-2GB03-2AX0

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C

##### SIPLUS HMI KTP700 Basic DP

6AG1123-2GA03-2AX0

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C

##### SIPLUS HMI KTP900 Basic

6AG1123-2JB03-2AX0

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C

##### SIPLUS HMI KTP1200 Basic

6AG1123-2MB03-2AX0

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C

##### SIPLUS HMI KTP1200 Basic DP

6AG1123-2MA03-2AX0

For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C

#### Accessories

See catalog ST 80 / ST PC or Industry Mail

### Technical specifications

Article number	6AG1123-2DB03-2AX0	6AG1123-2GB03-2AX0	6AG1123-2GA03-2AX0
Based on	6AV2123-2DB03-0AX0 SIPLUS HMI KTP400 BASIC	6AV2123-2GB03-0AX0 SIPLUS HMI KTP700 BASIC	6AV2123-2GA03-0AX0 SIPLUS HMI KTP700 BASIC DP
<b>Ambient conditions</b>			
Suited for indoor use		Yes	Yes
Suited for outdoor use		No	No
<b>Ambient temperature during operation</b>			
• Operation (vertical installation)			
- For vertical installation, min.	-20 °C; = Tmin	-20 °C	-20 °C; = Tmin
- For vertical installation, max.	60 °C; = Tmax	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position

# SIMATIC S7-1500 Advanced Controllers

## SIPLUS Operator control and monitoring

### SIPLUS Basic Panels (2nd Generation)

#### Technical specifications

Article number	<b>6AG1123-2DB03-2AX0</b>	<b>6AG1123-2GB03-2AX0</b>	<b>6AG1123-2GA03-2AX0</b>
Based on	<b>6AV2123-2DB03-0AX0</b> SIPLUS HMI KTP400 BASIC	<b>6AV2123-2GB03-0AX0</b> SIPLUS HMI KTP700 BASIC	<b>6AV2123-2GA03-0AX0</b> SIPLUS HMI KTP700 BASIC DP
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	<b>6AG1123-2JB03-2AX0</b>	<b>6AG1123-2MB03-2AX0</b>	<b>6AG1123-2MA03-2AX0</b>
Based on	<b>6AV2123-2JB03-0AX0</b> SIPLUS HMI KTP900 BASIC	<b>6AV2123-2MB03-0AX0</b> SIPLUS HMI KTP1200 BASIC	<b>6AV2123-2MA03-0AX0</b> SIPLUS HMI KTP1200 BASIC DP
<b>Ambient conditions</b>			
Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
<b>Ambient temperature during operation</b>			
• Operation (vertical installation)			
- For vertical installation, min.	-20 °C	-10 °C; = Tmin	-10 °C; = Tmin
- For vertical installation, max.	50 °C	50 °C	50 °C

## Technical specifications

Article number	6AG1123-2JB03-2AX0	6AG1123-2MB03-2AX0	6AG1123-2MA03-2AX0
Based on	6AV2123-2JB03-0AX0 SIPLUS HMI KTP900 BASIC	6AV2123-2MB03-0AX0 SIPLUS HMI KTP1200 BASIC	6AV2123-2MA03-0AX0 SIPLUS HMI KTP1200 BASIC DP
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A

## SIMATIC S7-1500 Advanced Controllers

### SIPLUS Operator control and monitoring

#### SIPLUS Basic Panels (1st Generation)

#### Overview



- Ideal entry-level series of 3.8" to 15" for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS 485/422

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Technical documentation on SIPLUS can be found here:  
<http://www.siemens.com/siplus-extreme>

#### Ordering data

#### Article No.

**SIPLUS HMI KP300 Basic mono PN** **6AG1647-0AH11-2AX0**

For areas with extreme exposure to media (conformal coating); ambient temperature -25 ... +60 °C

**SIPLUS HMI KTP400 Basic mono PN** **6AG1647-0AA11-2AX0**

For areas with extreme exposure to media (conformal coating); ambient temperature -10 ... +60 °C

#### Accessories

See catalog ST 80 / ST PC or Industry Mall

#### Technical specifications

Article number	<b>6AG1647-0AH11-2AX0</b>	<b>6AG1647-0AA11-2AX0</b>
Based on	<b>6AV6647-0AH11-3AX0</b> SIPLUS HMI KP300 BASIC MONO PN 3,6"	<b>6AV6647-0AA11-3AX0</b> SIPLUS KTP400 BASIC MONO PN 3,8"
<b>Ambient conditions</b>		
Suited for indoor use	Yes	Yes
Suited for outdoor use	No	No
<b>Ambient temperature during operation</b>		
• Operation (vertical installation)		
- For vertical installation, min.	-25 °C	-10 °C
- For vertical installation, max.	60 °C	60 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

### Technical specifications

Article number	6AG1647-0AH11-2AX0	6AG1647-0AA11-2AX0
Based on	6AV6647-0AH11-3AX0 SIPLUS HMI KP300 BASIC MONO PN 3,6"	6AV6647-0AA11-3AX0 SIPLUS KTP400 BASIC MONO PN 3,8"
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## SIMATIC S7-1500 Advanced Controllers

### SIPLUS Operator control and monitoring

#### SIPLUS Comfort Panels Standard

#### Overview



- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player
- Dimmable displays from 0 to 100% via PROFlenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available

- Data security in the event of a power failure for the device and for the SIMATIC HMI memory card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Easy project transfer via standard cable (standard Ethernet cable, standard USB cable)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2x PROFINET with integrated switch for 7" models or larger; plus 1 additional PROFINET with Gigabit support for 15" models or larger
- All variants can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- Key-operated devices with stamped keys for optimum tactile feedback
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

Ordering data	Article No.
<b>SIPLUS HMI Comfort Panels, Keys and Touch</b>	
SIPLUS HMI KTP400 Comfort	6AG1124-2DC01-4AX0
<b>SIPLUS HMI Comfort Panels, Touch</b>	
SIPLUS HMI TP700 Comfort	6AG1124-0GC01-4AX0
SIPLUS HMI TP900 Comfort	6AG1124-0JC01-4AX0
SIPLUS HMI TP1200 Comfort	6AG1124-0MC01-4AX0
SIPLUS HMI TP1500 Comfort	6AG1124-0QC02-4AX1
SIPLUS HMI TP1900 Comfort	6AG1124-0UC02-4AX1
SIPLUS HMI TP2200 Comfort	6AG1124-0XC02-4AX1

#### Article No.

Ordering data	Article No.
<b>SIPLUS HMI Comfort Panels, Keys</b>	
SIPLUS HMI KP400 Comfort	6AG1124-1DC01-4AX0
SIPLUS HMI KP700 Comfort	6AG1124-1GC01-4AX0
SIPLUS HMI KP900 Comfort	6AG1124-1JC01-4AX0
SIPLUS HMI KP1200 Comfort	6AG1124-1MC01-4AX0
SIPLUS HMI KP1500 Comfort	6AG1124-1QC02-4AX1
<b>Accessories</b>	See catalog ST 80 / ST PC or Industry Mall

## Technical specifications

Article number	6AG1124-2DC01-4AX0	6AG1124-0GC01-4AX0	6AG1124-0JC01-4AX0	6AG1124-0MC01-4AX0
Based on	6AV2124-2DC01-0AX0 SIPLUS HMI KTP400 COMFORT	6AV2124-0GC01-0AX0 SIPLUS HMI TP700 COMFORT	6AV2124-0JC01-0AX0 SIPLUS HMI TP900 COMFORT	6AV2124-0MC01-0AX0 SIPLUS HMI TP1200 COMFORT
<b>Ambient conditions</b>				
Suited for indoor use	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No
<b>Ambient temperature during operation</b>				
• Operation (vertical installation)				
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

# SIMATIC S7-1500 Advanced Controllers

## SIPLUS Operator control and monitoring

### SIPLUS Comfort Panels Standard

#### Technical specifications

Article number	<b>6AG1124-2DC01-4AX0</b>	<b>6AG1124-0GC01-4AX0</b>	<b>6AG1124-0JC01-4AX0</b>	<b>6AG1124-0MC01-4AX0</b>	
Based on	<b>6AV2124-2DC01-0AX0</b> SIPLUS HMI KTP400 COMFORT	<b>6AV2124-0GC01-0AX0</b> SIPLUS HMI TP700 COMFORT	<b>6AV2124-0JC01-0AX0</b> SIPLUS HMI TP900 COMFORT	<b>6AV2124-0MC01-0AX0</b> SIPLUS HMI TP1200 COMFORT	
<b>Conformal coating</b>					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	
Article number	<b>6AG1124-1DC01-4AX0</b>	<b>6AG1124-1GC01-4AX0</b>	<b>6AG1124-1JC01-4AX0</b>	<b>6AG1124-1MC01-4AX0</b>	<b>6AG1124-1QC02-4AX1</b>
Based on	<b>6AV2124-1DC01-0AX0</b> SIPLUS HMI KP400 COMFORT	<b>6AV2124-1GC01-0AX0</b> SIPLUS HMI KP700 COMFORT	<b>6AV2124-1JC01-0AX0</b> SIPLUS HMI KP900 COMFORT	<b>6AV2124-1MC01-0AX0</b> SIPLUS HMI KP1200 COMFORT	<b>6AV2124-1QC02-0AX1</b> SIPLUS HMI KP1500 Comfort
<b>Ambient conditions</b>					
Suited for indoor use	Yes	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No	No
<b>Ambient temperature during operation</b>					
• Operation (vertical installation)					
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; (55 °C, see entry ID: 64847814)
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>					
<b>Coolants and lubricants</b>					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *



# SIMATIC S7-1500 Advanced Controllers

## SIPLUS Operator control and monitoring

### SIPLUS Comfort Panels Standard

#### Technical specifications

Article number	6AG1124-1DC01-4AX0	6AG1124-1GC01-4AX0	6AG1124-1JC01-4AX0	6AG1124-1MC01-4AX0	6AG1124-1QC02-4AX1
Based on	6AV2124-1DC01-0AX0 SIPLUS HMI KP400 COMFORT	6AV2124-1GC01-0AX0 SIPLUS HMI KP700 COMFORT	6AV2124-1JC01-0AX0 SIPLUS HMI KP900 COMFORT	6AV2124-1MC01-0AX0 SIPLUS HMI KP1200 COMFORT	6AV2124-1QC02-0AX1 SIPLUS HMI KP1500 Comfort
<b>Use on ships/at sea</b>					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
<b>SIPLUS Comfort Panels Standard</b>					
Article number	6AG1124-0QC02-4AX1		6AG1124-0UC02-4AX1		6AG1124-0XC02-4AX1
Based on	6AV2124-0QC02-0AX1 SIPLUS HMI TP1500 Comfort		6AV2124-0UC02-0AX1 SIPLUS HMI TP1900 Comfort		6AV2124-0XC02-0AX1 SIPLUS HMI TP2200 Comfort
<b>Ambient conditions</b>					
Suited for indoor use	Yes		Yes		Yes
Suited for outdoor use	No		No		No
<b>Ambient temperature during operation</b>					
• Operation (vertical installation)					
- For vertical installation, min.	0 °C		0 °C; = Tmin		0 °C; = Tmin
- For vertical installation, max.	50 °C; (55 °C, see entry ID: 64847814)		45 °C; = Tmax		45 °C; = Tmax

# SIMATIC S7-1500 Advanced Controllers

## SIPLUS Operator control and monitoring

### SIPLUS Comfort Panels Standard

#### Technical specifications

Article number	<b>6AG1124-0QC02-4AX1</b>	<b>6AG1124-0UC02-4AX1</b>	<b>6AG1124-0XC02-4AX1</b>
Based on	<b>6AV2124-0QC02-0AX1</b> SIPLUS HMI TP1500 Comfort	<b>6AV2124-0UC02-0AX1</b> SIPLUS HMI TP1900 Comfort	<b>6AV2124-0XC02-0AX1</b> SIPLUS HMI TP2200 Comfort
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life  Yes; Conformal coating, Class A

### Overview

Everything for a simple way to get started: SIMATIC S7-1500 Starter Kits enable you to configure, mount, wire and use the PLC in quick and easy steps.

The following starter kits are available:

- **SIMATIC S7-1500 Starter Kit;**  
Consisting of CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation
- **SIMATIC S7-1500T Starter Kit;**  
Consisting of CPU 1511T-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation

### Current anniversary edition 60 years of SIMATIC

In 2018, Siemens celebrated 60 years of SIMATIC. To mark this occasion, every SIMATIC S7-1500 Starter Kit is expanded by TIA Portal options. In addition to STEP 7 Professional, the licenses for the option packages SIMATIC ProDiag S7-1500 for 250 supervisions and SIMATIC OPC UA S7-1500 Small for secure, reliable, manufacturer-and platform-independent communication are included.

### Ordering data

### Article No.

#### **SIMATIC S7-1500 Starter Kit**

**6ES7511-1CK03-4YB5**

Consisting of CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation

#### **SIMATIC S7-1500T Starter Kit**

**6ES7511-1TK02-4YB5**

Consisting of CPU 1511T-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation

## SIMATIC S7-1500 Advanced Controllers

### Accessories

#### DIN rail

##### Overview



- Aluminum DIN rail for mounting the SIMATIC S7-1500 or ET 200MP
- With integrated top hat DIN rail for snapping on a wide range of standard components
- Attachment of modules with a single screw
- Installation by screwing to the control cabinet wall
- Entire length of rail can be used
- Can also be mounted on low or flat top hat DIN rails, e.g. in control cabinets and terminals boxes, using top hat DIN rail adapter

##### Ordering data

##### Article No.

###### SIMATIC S7-1500 DIN rail

Fixed lengths, with grounding elements

- 160 mm
- 245 mm
- 482 mm
- 530 mm
- 830 mm

6ES7590-1AB60-0AA0  
6ES7590-1AC40-0AA0  
6ES7590-1AE80-0AA0  
6ES7590-1AF30-0AA0  
6ES7590-1AJ30-0AA0

For cutting to length by customer, without drill holes; grounding elements must be ordered separately

- 2 000 mm

6ES7590-1BC00-0AA0

###### PE connection element for DIN rail 2 000 mm

20 units

6ES7590-5AA00-0AA0

###### Top hat DIN rail adapter

For adapting S7-1500 DIN rails on low or flat top hat DIN rails, as pre-assembled in control cabinets and terminal boxes, for example. An adapter must be placed every 25 cm. Including mounting hardware. 10 units per packaging unit

6ES7590-6AA00-0AA0

###### SIMATIC Manual Collection

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

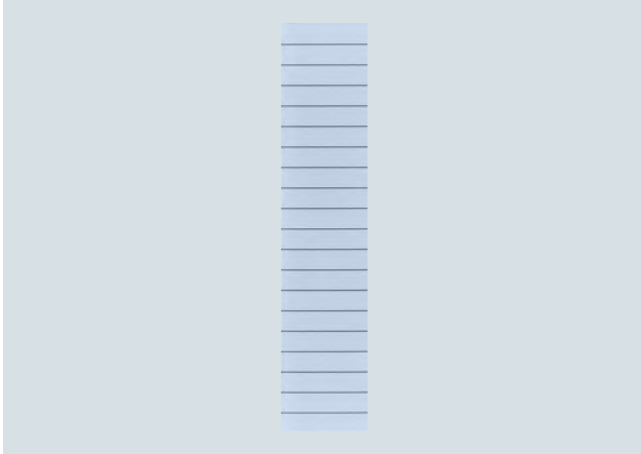
6ES7998-8XC01-8YE0

###### SIMATIC Manual Collection update service for 1 year

Current Manual Collection DVD and the three subsequent updates

6ES7998-8XC01-8YE2

### Overview



- Film sheets for the application-specific, automatic labeling of SIMATIC S7-1500 I/O modules using standard laser printers
- Direct printing possible from the TIA Portal
  - No double entry of symbols and/or addresses
  - Saves time and avoids typing errors
- Plain color films, tear-resistant, dirt-repellent
- Simple handling:
  - Perforated labeling sheets in DIN A4 format for easy separation of the labeling strips.
  - Detached strips can be inserted directly into the I/O modules.
- Different colors to differentiate module types; yellow reserved for fail-safe systems

### Ordering data

### Article No.

#### DIN A4 labeling sheet

For 35 mm module;  
10 sheets with 10 labeling strips  
each for I/O modules; perforated,  
Al gray

**6ES7592-2AX00-0AA0**

For 25 mm modules;  
10 sheets with 20 labeling strips  
each for I/O modules; perforated,  
Al gray

**6ES7592-1AX00-0AA0**

#### SIMATIC Manual Collection

Electronic manuals on DVD,  
multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC-based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0**

#### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD  
and the three subsequent updates

**6ES7998-8XC01-8YE2**

## SIMATIC S7-1500 Advanced Controllers

### Accessories

#### Spare parts

#### Overview

##### Front doors



- Versions:
  - Universal front doors for digital and analog I/O modules
  - Universal front doors for the interface module IM155-5 PN ST
- Included in the scope of supply of the respective modules. Can be ordered as a spare part in a set consisting of five universal (unlabeled) front doors.
- Front doors for I/O modules: Universal labeling sheets and cabling diagrams are included. Cabling diagrams can be detached from perforated sheets and inserted inside the door.

##### U connector



- To interconnect the modules (self-assembling backplane bus)
- Implementation of a rugged, interference-free station setup through
  - Consistent separation of supply voltage of modules and data signals
  - Fully shielded, gold-plated contacts for the data bus
- Included in the scope of supply of each module. Available as spare part in sets of 5.

##### Shielding



- Components for implementing the integrated S7-1500 shielding concept:
  - 24 V DC infeed element for supplying the analog module: strict separation of infeed and analog signals ensures high EMC stability.
  - Shield bracket for insertion in the front connector: allows a low-impedance connection and optimally dissipates interference.
  - Universal shield terminal: connects the cable shield with the shield bracket and is simultaneously used for mechanical fixing.
- Included in the scope of supply of the analog modules. Available as a spare part in two versions:
  - Shielding set, comprising infeed element, shield bracket, and shield terminal (pack of 5 units each)
  - Individual shield terminals (pack of 20)
- No tool required for assembly/disassembly

Ordering data	Article No.		Article No.
<b>Universal front door for IM 155-5 PN ST</b> 5 front doors; spare part	6ES7528-0AA70-7AA0		
<b>Universal front door for I/O modules</b> 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part <ul style="list-style-type: none"> <li>• For 35 mm modules</li> <li>• For 25 mm modules</li> </ul>	6ES7528-0AA00-7AA0 6ES7528-0AA00-0AA0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	6ES7998-8XC01-8YE0
<b>U connector</b> 5 units; spare part	6ES7590-0AA00-0AA0		
<b>Shielding set I/O</b> Infeed element, shield clamp, and shield terminal; 5 units, spare part <ul style="list-style-type: none"> <li>• For 35 mm modules</li> <li>• For 25 mm modules</li> </ul>	6ES7590-5CA00-0AA0 6ES7590-5CA10-0XA0	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2
<b>Shield terminal element</b> 10 units; spare part	6ES7590-5BA00-0AA0		

## SIMATIC S7-1500 Advanced Controllers

Notes

4



## SIMATIC S7-300 Advanced Controllers



<b>5/3</b>	<b>Introduction</b>	<b>5/135</b>	<b>Function modules</b>
5/3	S7-300/S7-300F, SIPLUS S7-300	5/135	FM 350-1 counter module
<b>5/5</b>	<b>Central processing units</b>	5/137	FM 350-2 counter module
5/5	Standard CPUs	5/139	FM 351 positioning module
5/15	SIPLUS S7-300 standard CPUs	5/141	FM 352 cam controller
5/20	Compact CPUs	5/143	FM 352-5 high-speed Boolean processor
5/30	SIPLUS S7-300 compact CPUs	5/147	FM 355 controller module
5/37	Fail-safe CPUs	5/151	FM 355-2 temperature controller module
5/44	SIPLUS S7-300 fail-safe CPUs	5/155	SM 338 POS input module
5/50	Technology CPUs	5/157	IM 174 PROFIBUS module
<b>5/56</b>	<b>I/O modules</b>	5/160	SIWAREX U
5/56	<u>Digital modules</u>	5/163	SIWAREX FTA
5/56	SM 321 digital input modules	5/166	SIWAREX FTC
5/61	SM 322 digital output modules	5/169	<u>SIPLUS S7-300 function modules</u>
5/66	SM 323/SM 327 digital input/output modules	5/169	SIPLUS S7-300 FM 350-1
5/69	<u>SIPLUS S7-300 digital modules</u>	5/171	SIPLUS S7-300 FM 350-2
5/69	SIPLUS S7-300 SM 321	5/173	SIPLUS SIWAREX U
5/73	SIPLUS S7-300 SM 322	5/175	SIPLUS SIWAREX FTA
5/78	SIPLUS S7-300 SM 323	5/177	<u>Communication</u>
5/80	<u>Analog modules</u>	5/177	CP 340
5/80	SM 331 analog input modules	5/179	CP 341
5/88	SM 332 analog output modules	5/181	Loadable drivers for CP 441-2 and CP 341
5/91	SM 334 analog input/output modules	5/183	CP 343-2P/CP 343-2
5/95	<u>SIPLUS S7-300 analog modules</u>	5/185	CP 342-5
5/95	SIPLUS S7-300 SM 331	5/187	CP 342-5 FO
5/99	SIPLUS S7-300 SM 332	5/189	CP 343-5
5/102	SIPLUS S7-300 SM 334	5/191	CP 343-1 Lean
5/104	<u>F-digital/analog modules</u>	5/194	CP 343-1
5/104	SM 326 F-digital input modules - Safety Integrated	5/197	CP 343-1 Advanced
5/107	SM 326 F-digital output modules - Safety Integrated	5/201	CSM 377 unmanaged
5/110	SM 336 F-analog input modules - Safety Integrated	5/203	TIM 3V-IE (for S7-300)
5/112	Safety protector	5/206	TIM 3V-IE Advanced (for S7-300)
5/113	<u>SIPLUS S7-300 F-digital/analog modules</u>	5/209	TIM 4R-IE (for S7-300/-400/PC)
5/113	SIPLUS S7-300 SM 326 - Safety Integrated	5/212	TIM 3V-IE DNP3 (for S7-300)
5/116	SIPLUS S7-300 SM 326 - Safety Integrated	5/214	TIM 4R-IE DNP3 (for S7-300/-400)
5/119	SIPLUS S7-300 SM 336 - Safety Integrated	5/216	ASM 475
5/121	SIPLUS S7-300 safety protector	5/218	<u>SIPLUS S7-300 communication</u>
5/122	<u>Ex digital modules</u>	5/218	SIPLUS S7-300 CP 340
5/122	Ex digital input modules	5/220	SIPLUS S7-300 CP 341
5/124	Ex digital output modules	5/222	SIPLUS CP 342-5
5/126	<u>SIPLUS S7-300 Ex digital modules</u>	5/223	SIPLUS S7-300 CP 343-1 Lean
5/126	SIPLUS S7-300 Ex digital input modules	5/225	SIPLUS S7-300 CP 343-1
5/128	<u>Ex analog modules</u>	5/227	SIPLUS S7-300 CP 343-1 Advanced
5/128	Ex analog input modules	5/230	SIPLUS TIM 3V-IE for WAN and Ethernet
5/131	Ex analog output modules	5/232	SIPLUS TIM 4R-IE for WAN and Ethernet
5/133	<u>SIPLUS S7-300 Ex analog modules</u>	5/234	SIPLUS TIM 3V-IE DNP3
5/133	SIPLUS S7-300 Ex analog input modules	5/236	SIPLUS TIM 4R-IE DNP3

## SIMATIC S7-300 Advanced Controllers



5/238	<u>Special modules</u>
5/238	SM 374 simulator
5/239	DM 370 dummy module
5/240	<u>SIPLUS S7-300 special modules</u>
5/240	SIPLUS S7-300 DM 370
5/241	<u>Connection system</u>
5/241	Front connectors
5/242	System cabling for SIMATIC S7-300 and ET 200M
5/243	- Fully modular connection
5/247	- Front connector with single wires
5/248	- Front connectors with crimp connections

5/249	<b>Power supplies</b>
5/249	1-phase, 24 V DC (for S7-300 and ET200M)
5/253	<b>SIPLUS power supplies</b>
5/253	1-phase, 24 V DC (for S7-300 and ET200M)
5/255	<b>Interface modules</b>
5/255	IM 360/361/365 interface modules
5/256	<b>SIPLUS interface modules</b>
5/256	SIPLUS S7-300 IM 365
5/257	<b>Accessories</b>
5/257	DIN rail
5/257	Labeling sheets

### Overview



#### S7-300

- The modular mini PLC system for the low and mid-performance ranges
- With comprehensive range of modules for optimum adaptation to the automation task
- Flexible use through simple implementation of distributed structures and versatile networking
- User-friendly handling and uncomplicated design without a fan
- Can be expanded without problems when the tasks increase
- Powerful thanks to a range of integrated functions

#### S7-300F

- Fail-safe automation system for plants with increased safety requirements for production technology
- Based on S7-300
- Additional ET 200S and ET 200M distributed I/O stations complete with safety-related modules can be connected
- Safety-related communication via PROFIBUS DP with PROFIsafe profile
- Standard modules can be used in addition for non-safety-relevant applications

#### Availability

As part of our established product portfolio, the SIMATIC S7-300/ET 200M system families will generally be available until 2023.

Following the product phase-out declaration, products will be available as spare parts for another ten years.

### Technical specifications

#### General technical specifications SIMATIC S7-300

Degree of protection	IP20 according to IEC 60 529
Ambient temperature	<ul style="list-style-type: none"> <li>• For horizontal installation 0 to 60 °C</li> <li>• For vertical installation 0 to 40 °C</li> </ul>
Relative humidity	10 to 95%, non-condensing, corresponds to relative humidity (RH), stress level 2 acc. to IEC 61131, Part 2
Air pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)
Insulation	<ul style="list-style-type: none"> <li>• &lt; 50 V 500 V DC test voltage</li> <li>• &lt; 150 V 2500 V DC test voltage</li> <li>• &lt; 250 V 4000 V DC test voltage</li> </ul>
Electromagnetic compatibility	<p>Requirements of the EMC directive; interference immunity according to IEC 61000-6-2</p> <ul style="list-style-type: none"> <li>• Pulse-shaped disturbance variables Test according to: Electrostatic discharge according to IEC 61000-4-2, burst pulses according to IEC 61000-4-4, energy single pulse (surge) according to IEC 61000-4-5,</li> <li>• Sinusoidal disturbance variables Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6</li> <li>• Emission of radio interference Interference emission according to EN 50081-2</li> </ul> <p>Test according to: Emitted interference of electromagnetic fields according to EN 55016: Limit value class A, (measured at a distance of 10 m) Interference emission via AC mains according to EN 55011: Limit value class A, Group 1</p>
Mechanical strength	<ul style="list-style-type: none"> <li>• Vibrations</li> </ul> <p>Frequency range <math>10 \text{ Hz} \leq f \leq 58 \text{ Hz}</math></p> <ul style="list-style-type: none"> <li>• Continuous: 0.0375 mm amplitude</li> <li>• Occasionally 0.75 mm amplitude</li> </ul> <p>Frequency range <math>58 \text{ Hz} \leq f \leq 150 \text{ Hz}</math></p> <ul style="list-style-type: none"> <li>• Continuous: 0.5 g constant acceleration</li> <li>• Occasionally 1 g constant acceleration</li> </ul> <p>Testing according to IEC 60068-2-6 Tested with: <math>5 \text{ Hz} \leq f \leq 9 \text{ Hz}</math>, constant amplitude 3.5 mm; <math>9 \text{ Hz} \leq f \leq 150 \text{ Hz}</math>, constant acceleration 1 g; Duration of oscillation: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes Testing according to IEC 60068-2-27 Tested with: Half-sine wave: strength of shock 15 g peak value, 11 ms duration; Shock direction: 3 shocks each in <math>\pm</math> direction in each of the 3 mutually vertical axes</p>
• Shock	

# SIMATIC S7-300 Advanced Controllers

## Introduction

### S7-300/S7-300F, SIPLUS S7-300

#### Technical specifications

##### General technical specifications SIPLUS S7-300

Ambient temperature range	-40/-25 ... +60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the environmental conditions.

##### Ambient conditions

Extended range of environmental conditions	
<ul style="list-style-type: none"> <li>with reference to ambient temperature, air pressure and altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<ul style="list-style-type: none"> <li>At cold restart, min.</li> </ul>	0° C
Relative humidity	
<ul style="list-style-type: none"> <li>with condensation, max.</li> </ul>	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
<ul style="list-style-type: none"> <li>to biologically active substances/ compliance with EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
<ul style="list-style-type: none"> <li>to chemically active substances/ compliance with EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
<ul style="list-style-type: none"> <li>to mechanically active substances, compliance with EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

### Overview CPU 312



- The entry level CPU in Totally Integrated Automation (TIA)
- For smaller applications with moderate processing performance requirements

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 314



- For plants with medium program scope requirements
- High processing power in binary and floating-point arithmetic

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 315-2 DP



- The CPU with medium to large program memory and quantity structures for optional use of SIMATIC engineering tools
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS

SIMATIC Micro Memory Card required for operation of CPU.

## SIMATIC S7-300 Advanced Controllers

### Central processing units

#### Standard CPUs

##### Overview CPU 315-2 PN/DP



- The CPU with mid-range program memory and quantity frameworks
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Component-based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component-based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS and PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

##### Overview CPU 317-2 DP



- The CPU with a large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- High processing power in binary and floating-point arithmetic
- 2 PROFIBUS DP master/slave interfaces
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 317-2 PN/DP



- The CPU with a large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- High processing power in binary and floating-point arithmetic
- PROFINET interface with 2-port switch
- PROFINET I/O Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or third-party PROFINET I/O Controller
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS and PROFINET
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 319-3 PN/DP



- The CPU with high command processing performance, large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O on PROFIBUS and PROFINET
- PROFINET I/O controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET interface with 2-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integrated web server with the option of creating user-defined web pages
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of the CPU.

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Standard CPUs

Ordering data	Article No.	Ordering data	Article No.
<b>CPU 312</b> 32 KB work memory, supply voltage 24 V DC, MPI; MMC required	6ES7312-1AE14-0AB0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	6ES7998-8XC01-8YE0
<b>CPU 314</b> 128 KB work memory, supply voltage 24 V DC, MPI; MMC required	6ES7314-1AG14-0AB0	<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	6ES7998-8XC01-8YE2
<b>CPU 315-2 DP</b> 256 KB work memory, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required	6ES7315-2AH14-0AB0	<b>Power supply connector</b> 10 units, spare part	6ES7391-1AA00-0AA0
<b>CPU 315-2 PN/DP</b> 384 KB work memory, 24 V DC supply voltage, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	6ES7315-2EH14-0AB0	<b>USB A2 PC adapter</b> For connecting a programming device/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery	6GK1571-0BA00-0AA0
<b>CPU 317-2 DP</b> 1 MB work memory, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required	6ES7317-2AK14-0AB0	<b>PROFIBUS bus components</b>	
<b>CPU 317-2 PN/DP</b> 1 MB work memory, 24 V DC supply voltage, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	6ES7317-2EK14-0AB0	<b>PROFIBUS DP RS 485 bus connector</b> • With 90° cable outlet, max. transfer rate 12 Mbps - Without programming device interface - With programming device interface • With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps - Without programming device interface, 1 unit - Without programming device interface, 100 units - With programming device interface, 1 unit - With programming device interface, 100 units • With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0 6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0 6GK1500-0EA02
<b>CPU 319-3 PN/DP</b> 2 MB work memory, 24 V DC supply voltage, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	6ES7318-3EL01-0AB0	<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0EH10
<b>SIMATIC Micro Memory Card</b> 64 KB 128 KB 512 KB 2 MB 4 MB 8 MB	6ES7953-8LF31-0AA0 6ES7953-8LG31-0AA0 6ES7953-8LJ31-0AA0 6ES7953-8LL31-0AA0 6ES7953-8LM32-0AA0 6ES7953-8LP31-0AA0	<b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	6ES7972-0AA02-0XA0
<b>MPI cable</b> For connection of SIMATIC S7 and programming device via MPI; length 5 m	6ES7901-0BF00-0AA0		
<b>Slot number plates</b>	6ES7912-0AA00-0AA0		



Ordering data	Article No.	Article No.
<b>PROFINET bus components</b>		
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter	<b>6XV1840-2AH10</b>	
<b>FO standard cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	<b>6XV1873-2A</b>	
<b>SCALANCE X204-2 Industrial Ethernet Switch</b> Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>	
<b>Compact Switch Module CSM 377</b> Unmanaged switch for connecting SIMATIC S7-300, ET 200M and up to three other stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	<b>6GK7377-1AA00-0AA0</b>	
		<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables
		<b>IE FC RJ45 plug 145</b> 145° cable outlet 1 unit 10 units 50 units
		<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units
		<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication
		See Industry Mall
		<b>6GK1901-1BB30-0AA0</b> <b>6GK1901-1BB30-0AB0</b> <b>6GK1901-1BB30-0AE0</b>
		<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>

### Technical specifications

Article number	<b>6ES7312-1AE14-0AB0</b>	<b>6ES7314-1AG14-0AB0</b>	<b>6ES7315-2AH14-0AB0</b>	<b>6ES7315-2EH14-0AB0</b>
	CPU312, 32KB	CPU314, 128 KB	CPU315-2DP, 256 KB	CPU315-2 PN/DP, 384 KB
<b>General information</b>				
<b>Product function</b>				
• Isochronous mode			Yes	Yes; Via PROFIBUS DP or PROFINET interface
<b>Engineering with</b>				
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218	STEP 7 V5.5 or higher
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	24 V
<b>Memory</b>				
<b>Work memory</b>				
• integrated	32 kbyte	128 kbyte	256 kbyte	384 kbyte
• expandable	No	No	No	No
<b>Load memory</b>				
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>				
for bit operations, typ.	0.1 µs	0.06 µs	0.05 µs	0.05 µs
for word operations, typ.	0.24 µs	0.12 µs	0.09 µs	0.09 µs
for fixed point arithmetic, typ.	0.32 µs	0.16 µs	0.12 µs	0.12 µs
for floating point arithmetic, typ.	1.1 µs	0.59 µs	0.45 µs	0.45 µs

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Standard CPUs

#### Technical specifications

Article number	6ES7312-1AE14-0AB0 CPU312, 32KB	6ES7314-1AG14-0AB0 CPU314, 128 KB	6ES7315-2AH14-0AB0 CPU315-2DP, 256 KB	6ES7315-2EH14-0AB0 CPU315-2 PN/DP, 384 KB
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	256	256	256	256
<b>IEC counter</b>				
• present	Yes	Yes	Yes	Yes
<b>S7 times</b>				
• Number	256	256	256	256
<b>IEC timer</b>				
• present	Yes	Yes	Yes	Yes
<b>Data areas and their retentivity</b>				
<b>Flag</b>				
• Size, max.	256 byte	256 byte	2 048 byte	2 048 byte
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	1 024 byte	1 024 byte	2 048 byte	2 048 byte
• Outputs	1 024 byte	1 024 byte	2 048 byte	2 048 byte
<b>Process image</b>				
• Inputs, adjustable	1 024 byte	1 024 byte	2 048 byte	2 048 byte
• Outputs, adjustable	1 024 byte	1 024 byte	2 048 byte	2 048 byte
<b>Time of day</b>				
<b>Clock</b>				
• Hardware clock (real-time)		Yes	Yes	Yes
• Software clock	Yes			
<b>Operating hours counter</b>				
• Number	1	1	1	1
<b>1. Interface</b>				
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
<b>Interface types</b>				
• RS 485	Yes	Yes	Yes	Yes
<b>Protocols</b>				
• MPI	Yes	Yes	Yes	Yes
• PROFIBUS DP master	No	No	No	Yes
• PROFIBUS DP slave	No	No	No	Yes
• Point-to-point connection	No	No	No	No
<b>PROFIBUS DP master</b>				
• Number of DP slaves, max.				124
<b>2. Interface</b>				
Interface type			Integrated RS 485 interface	
<b>Interface types</b>				
• RJ 45 (Ethernet)				Yes
• RS 485			Yes	
• Number of ports				2
<b>Protocols</b>				
• MPI			No	No
• PROFINET IO Controller				Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device				Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA				Yes
• PROFIBUS DP master			Yes	No
• PROFIBUS DP slave			Yes	No
<b>PROFIBUS DP master</b>				
• Number of DP slaves, max.			124; Per station	

### Technical specifications

Article number	6ES7312-1AE14-0AB0 CPU312, 32KB	6ES7314-1AG14-0AB0 CPU314, 128 KB	6ES7315-2AH14-0AB0 CPU315-2DP, 256 KB	6ES7315-2EH14-0AB0 CPU315-2 PN/DP, 384 KB
<b>PROFINET IO Controller</b>				
<b>Services</b>				
- Number of connectable IO Devices, max.				128
- Of which IO devices with IRT, max.				64
- Number of IO Devices with IRT and the option "high flexibility"				128
- Number of connectable IO Devices for RT, max.				128
<b>Protocols</b>				
<b>Open IE communication</b>				
• TCP/IP				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
• ISO-on-TCP (RFC1006)				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
• UDP				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
<b>Web server</b>				
• supported				Yes
<b>Communication functions</b>				
PG/OP communication	Yes	Yes	Yes	Yes
Data record routing	No	No	Yes	Yes
<b>Global data communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S7 basic communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S7 communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S5 compatible communication</b>				
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Number of connections</b>				
• overall	6	12	16	16
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C
<b>Configuration</b>				
<b>Programming</b>				
<b>Programming language</b>				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes
<b>Know-how protection</b>				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm
<b>Weights</b>				
Weight, approx.	270 g	280 g	290 g	340 g

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Standard CPUs

#### Technical specifications

Article number	<b>6ES7317-2AK14-0AB0</b> CPU317-2 DP, 1 MB	<b>6ES7317-2EK14-0AB0</b> CPU317-2 PN/DP, 1 MB	<b>6ES7318-3EL01-0AB0</b> CPU319-3 PN/DP, 2 MB
<b>General information</b>			
<b>Product function</b>			
• Isochronous mode		Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via 2nd PROFIBUS DP or PROFINET interface
<b>Engineering with</b>			
• Programming package	STEP 7 as of V5.5 + SP1 or STEP 7 V5.2 + SP1 or higher with HSP 202	STEP 7 V5.5 or higher	STEP 7 V5.5 or higher
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
<b>Memory</b>			
<b>Work memory</b>			
• integrated	1 024 kbyte	1 024 kbyte	2 048 kbyte
• expandable	No	No	No
<b>Load memory</b>			
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	0.025 µs	0.025 µs	0.004 µs
for word operations, typ.	0.03 µs	0.03 µs	0.01 µs
for fixed point arithmetic, typ.	0.04 µs	0.04 µs	0.01 µs
for floating point arithmetic, typ.	0.16 µs	0.16 µs	0.04 µs
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	512	512	2 048
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	512	512	2 048
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	4 096 byte	4 096 byte	8 192 byte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	8 192 byte	8 192 byte	8 192 byte
• Outputs	8 192 byte	8 192 byte	8 192 byte
<b>Process image</b>			
• Inputs, adjustable	8 192 byte	8 192 byte	8 192 byte
• Outputs, adjustable	8 192 byte	8 192 byte	8 192 byte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	4	4	4
<b>1. Interface</b>			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
<b>Interface types</b>			
• RS 485	Yes	Yes	Yes
<b>Protocols</b>			
• MPI	Yes	Yes	Yes
• PROFIBUS DP master	Yes	Yes	Yes
• PROFIBUS DP slave	Yes; A DP slave at both interfaces simultaneously is not possible	Yes	Yes; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No	No	No
<b>PROFIBUS DP master</b>			
• Number of DP slaves, max.	124	124	124

### Technical specifications

Article number	6ES7317-2AK14-0AB0 CPU317-2 DP, 1 MB	6ES7317-2EK14-0AB0 CPU317-2 PN/DP, 1 MB	6ES7318-3EL01-0AB0 CPU319-3 PN/DP, 2 MB
<b>2. Interface</b>			
Interface type	Integrated RS 485 interface		Integrated RS 485 interface
<b>Interface types</b>			
<ul style="list-style-type: none"> <li>• RJ 45 (Ethernet)</li> <li>• RS 485</li> <li>• Number of ports</li> </ul>	Yes	Yes  2	Yes
<b>Protocols</b>			
<ul style="list-style-type: none"> <li>• MPI</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• PROFINET CBA</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> </ul>	No   Yes Yes; A DP slave at both interfaces simultaneously is not possible	No Yes; Also simultaneously with IO-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No No	No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible
<b>PROFIBUS DP master</b>			
<ul style="list-style-type: none"> <li>• Number of DP slaves, max.</li> </ul>	124		124
<b>PROFINET IO Controller</b>			
<b>Services</b>			
<ul style="list-style-type: none"> <li>- Number of connectable IO Devices, max.</li> <li>- Of which IO devices with IRT, max.</li> <li>- Number of IO Devices with IRT and the option "high flexibility"</li> <li>- Number of connectable IO Devices for RT, max.</li> </ul>		128 64 128 128	
<b>3. Interface</b>			
<b>Interface types</b>			
<ul style="list-style-type: none"> <li>• RJ 45 (Ethernet)</li> <li>• Number of ports</li> </ul>			Yes 2
<b>Protocols</b>			
<ul style="list-style-type: none"> <li>• MPI</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• PROFINET CBA</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> </ul>			No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No No
<b>PROFINET IO Controller</b>			
<b>Services</b>			
<ul style="list-style-type: none"> <li>- Number of connectable IO Devices, max.</li> <li>- Of which IO devices with IRT, max.</li> <li>- Number of IO Devices with IRT and the option "high flexibility"</li> <li>- Number of connectable IO Devices for RT, max.</li> </ul>			256 64 256 256
<b>Protocols</b>			
<b>Open IE communication</b>			
<ul style="list-style-type: none"> <li>• TCP/IP</li> <li>- Number of connections, max.</li> <li>• ISO-on-TCP (RFC1006)</li> <li>- Number of connections, max.</li> <li>• UDP</li> <li>- Number of connections, max.</li> </ul>		Yes; via integrated PROFINET interface and loadable FBs 16 Yes; via integrated PROFINET interface and loadable FBs 16 Yes; via integrated PROFINET interface and loadable FBs 16	Yes; via integrated PROFINET interface and loadable FBs 32 Yes; via integrated PROFINET interface and loadable FBs 32 Yes; via integrated PROFINET interface and loadable FBs 32
<b>Web server</b>			
<ul style="list-style-type: none"> <li>• supported</li> </ul>		Yes	Yes

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Standard CPUs

#### Technical specifications

Article number	<b>6ES7317-2AK14-0AB0</b> CPU317-2 DP, 1 MB	<b>6ES7317-2EK14-0AB0</b> CPU317-2 PN/DP, 1 MB	<b>6ES7318-3EL01-0AB0</b> CPU319-3 PN/DP, 2 MB
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5 compatible communication</b>			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Number of connections</b>			
• overall	32	32	32
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/ password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	40 mm	40 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
<b>Weights</b>			
Weight, approx.	360 g	340 g	1 250 g

### Overview SIPLUS CPU 314



- For plants with medium requirements on the program scope
- High processing performance in binary and floating-point arithmetic

SIPLIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Overview SIPLUS CPU 315-2 DP



- The CPU with medium to large program memory and quantity structures for optional use of SIMATIC engineering tools
- High processing performance in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures

SIPLIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## SIMATIC S7-300 Advanced Controllers

Central processing units

### SIPLUS S7-300 standard CPUs

#### Overview SIPLUS CPU 315-2 PN/DP



- The CPU with medium-sized program memory and quantity frameworks
- High processing performance in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS

SIMATIC Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Overview SIPLUS CPU 317-2 PN/DP



- The CPU with a large program memory and quantity framework for demanding applications
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET I/O Controller for operating distributed I/O on PROFINET
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- High processing performance in binary and floating-point arithmetic
- Combined MPI/PROFIBUS DP master/slave interface
- Optionally supports the use of SIMATIC engineering tools

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.



Ordering data	Article No.	Article No.
<b>SIPLUS S7-300 CPU 314</b> <i>For industrial applications with extended ambient conditions</i> CPU, 128 KB work memory, supply voltage 24 V DC, MPI; MMC required Extended temperature range and exposure to media	<b>6AG1314-1AG14-7AB0</b>	<i>For communication within the application</i> <b>PROFIBUS DP RS 485 bus connector</b> (extended temperature range and exposure to media) With 90° cable outlet, max. transfer rate 12 Mbps <ul style="list-style-type: none"> <li>Without programming device interface</li> <li>With programming device interface</li> </ul> With angled cable outlet, max. transmission rate 12 Mbps <ul style="list-style-type: none"> <li>Without programming device interface</li> <li>With programming device interface</li> </ul> With insulation displacement terminals, max. transfer rate 12 Mbps <ul style="list-style-type: none"> <li>With programming device interface, grounding via control cabinet cover</li> </ul> (Extended temperature range) With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS
<b>SIPLUS S7-300 CPU 315-2 DP</b> <i>For industrial applications with extended ambient conditions</i> CPU, 256 KB work memory, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required Extended temperature range and exposure to media	<b>6AG1315-2AH14-7AB0</b>	<b>6AG1972-0BA12-2XA0</b> <b>6AG1972-0BB12-2XA0</b> <b>6AG1972-0BA42-7XA0</b> <b>6AG1972-0BB42-7XA0</b>
<b>SIPLUS S7-300 CPU 315-2 PN/DP</b> <i>For industrial applications with extended ambient conditions</i> CPU, 384 KB work memory, supply voltage 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required Extended temperature range and exposure to media	<b>6AG1315-2EH14-7AB0</b>	<b>6AG1972-0BB70-7XA0</b> <b>6AG1500-0EA02-2AA0</b>
<b>SIPLUS S7-300 CPU 317-2 PN/DP</b> <i>For industrial applications with extended ambient conditions</i> CPU, 1 MB work memory, supply voltage 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required Extended temperature range and exposure to media	<b>6AG1317-2EK14-7AB0</b>	<b>IE FC RJ45 plug 180</b> (extended temperature range and exposure to media) 180° cable outlet <ul style="list-style-type: none"> <li>1 unit</li> </ul> <b>SIPLUS SCALANCE XC-200 Industrial Ethernet Switches</b> Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager; incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM Extended temperature range and exposure to media Switches with PROFINET delivery state <ul style="list-style-type: none"> <li><b>SIPLUS SCALANCE XC206-2 (ST/BFOC)</b> with six RJ45 ports 10/100 Mbps and two ST/BFOC ports 100 Mbps</li> </ul>
<b>Accessories</b> <i>Mandatory</i> <b>SIMATIC Micro Memory Card</b> 64 KB 128 KB 512 KB 2 MB 4 MB 8 MB	<b>6ES7953-8LF31-0AA0</b> <b>6ES7953-8LG31-0AA0</b> <b>6ES7953-8LJ31-0AA0</b> <b>6ES7953-8LL31-0AA0</b> <b>6ES7953-8LM32-0AA0</b> <b>6ES7953-8LP31-0AA0</b>	<b>6AG1901-1BB10-7AA0</b> <b>6AG1206-2BB00-7AC2</b> <b>6XV1830-0EH10</b> <b>6AG1972-0AA02-7XA0</b> <b>6XV1840-2AH10</b> <b>6XV1873-2A</b>
		<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m <b>RS 485 repeater for PROFIBUS</b> (extended temperature range and exposure to media) Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure <b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter <b>FO standard cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### SIPLUS S7-300 standard CPUs

#### Ordering data

*For commissioning*

##### MPI cable

For connection of SIMATIC S7 and programming device via MPI; length 5 m

##### USB A2 PC adapter

For connecting a programming device/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery

*Consumables*

##### Power supply connector

10 units, spare part

##### Slot number plates

#### Article No.

**6ES7901-0BF00-0AA0**

**6GK1571-0BA00-0AA0**

**6ES7391-1AA00-0AA0**

**6ES7912-0AA00-0AA0**

#### Article No.

*Documentation*

##### SIMATIC Manual Collection

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

Current Manual Collection DVD and the three subsequent updates

**6ES7998-8XC01-8YE0**

**6ES7998-8XC01-8YE2**

#### Technical specifications

Article number	<b>6AG1314-1AG14-7AB0</b>	<b>6AG1315-2AH14-7AB0</b>
Based on	<b>6ES7314-1AG14-0AB0</b> SIPLUS S7-300 CPU314	<b>6ES7315-2AH14-0AB0</b> SIPLUS S7-300 CPU 315-2DP
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

### Technical specifications

Article number	6AG1315-2EH14-7AB0 6ES7315-2EH14-0AB0 SIPLUS S7-300 CPU315-2PN/DP	6AG1317-2EK14-7AB0 6ES7317-2EK14-0AB0 SIPLUS S7-300 CPU317-2PN/DP
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; @ 60°C for UL/ATEX/FM use
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

## SIMATIC S7-300 Advanced Controllers

### Central processing units

#### Compact CPUs

##### Overview CPU 312C



- The compact CPU with integral digital inputs/outputs
- For small applications with increased processing performance requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of CPU.

##### Overview CPU 313C-2 PtP



- The compact CPU with integrated digital inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

##### Overview CPU 313C



- The compact CPU with integral digital and analog inputs/outputs
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

##### Overview 313C-2 DP



- The compact CPU with integral digital inputs/outputs and PROFIBUS DP master/slave interface
- For plants with high processing performance and response time requirements
- With technological functions
- For tasks with special functions
- For connecting distributed I/Os

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 314C-2 PtP



- The compact CPU with integrated digital and analog inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

### Overview CPU 314C-2 DP



- The compact CPU with integral digital and analog inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For plants with high processing performance and response time requirements
- For connecting distributed I/Os

SIMATIC Micro Memory Card required for operation of the CPU.

### Overview CPU 314C-2 PN/DP



- The compact CPU with integral digital and analog inputs/outputs and technological functions
- High processing performance in binary and floating-point arithmetic
- For connecting distributed I/O via PROFIBUS and PROFINET
- Combined MPI/PROFIBUS DP master/slave interface
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Component-based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component-based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Isochronous mode on PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Compact CPUs

#### Ordering data

##### CPU 312C

Compact CPU, 64 KB work memory, 24 V DC supply voltage, 10 DI/6 DQ integrated, integrated functions, MPI; including slot number labels; MMC required

6ES7312-5BF04-0AB0

##### CPU 313C

Compact CPU, 128 KB work memory, 24 V DC supply voltage, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI; MMC required

6ES7313-5BG04-0AB0

##### CPU 313C-2 PtP

Compact CPU, 128 KB work memory, 24 V DC supply voltage, 16 DI/16 DQ integrated, integrated functions, MPI, RS 422/485 interface; MMC required

6ES7313-6BG04-0AB0

##### CPU 313C-2 DP

Compact CPU, 128 KB work memory, 24 V DC supply voltage, 16 DI/16 DQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required

6ES7313-6CG04-0AB0

##### CPU 314C-2 PtP

Compact CPU, 192 KB work memory, 24 V DC supply voltage, 24DI/16DQ/4AI/2AQ integrated, integrated functions, MPI, RS 422/485 interface; MMC required

6ES7314-6BH04-0AB0

##### CPU 314C-2 DP

Compact CPU, 192 KB work memory, 24 V DC supply voltage, 24 DI/16 DQ/4 AI/2 AQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required

6ES7314-6CH04-0AB0

##### CPU 314C-2 PN/DP

Compact CPU, 192 KB work memory, 24 V DC supply voltage, 24 DI/16 DQ/4 AI/2 AQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; PROFINET IO controller/I-Device interface, MMC required

6ES7314-6EH04-0AB0

##### SIMATIC Micro Memory Card

64 KB

6ES7953-8LF31-0AA0

128 KB

6ES7953-8LG31-0AA0

512 KB

6ES7953-8LJ31-0AA0

2 MB

6ES7953-8LL31-0AA0

4 MB

6ES7953-8LM32-0AA0

8 MB

6ES7953-8LP31-0AA0

##### MPI cable

For connection of SIMATIC S7 and programming device via MPI; length 5 m

6ES7901-0BF00-0AA0

##### Point-to-point link cable

For connection to CPU 31xC-2 PtP

5 m

6ES7902-3AB00-0AA0

10 m

6ES7902-3AC00-0AA0

50 m

6ES7902-3AG00-0AA0

##### Front connector (1 unit)

For compact CPUs

40-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AM00-0AA0

6ES7392-1AM00-1AB0

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BM01-0AA0

6ES7392-1BM01-1AB0

##### SIMATIC TOP connect

See page 5/242; for information about which components can be used for the respective module, see Industry Mall

##### Front door, elevated design

For compact CPUs; for connecting 1.3 mm<sup>2</sup>/16 AWG wires; wiring diagram and labeling strips in petrol

6ES7328-7AA20-0AA0

##### Slot number plates

6ES7912-0AA00-0AA0

##### SIMATIC Manual Collection

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

6ES7998-8XC01-8YE0

##### SIMATIC Manual Collection update service for 1 year

Current Manual Collection DVD and the three subsequent updates

6ES7998-8XC01-8YE2

##### Power supply connector

10 units, spare part

6ES7391-1AA00-0AA0

##### Labeling strips

10 units, spare part

6ES7392-2XX00-0AA0

##### Label cover

10 units, spare part

6ES7392-2XY00-0AA0

##### Labeling sheets for machine inscription

For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units

Petrol

6ES7392-2AX10-0AA0

Light beige

6ES7392-2BX10-0AA0

Yellow

6ES7392-2CX10-0AA0

Red

6ES7392-2DX10-0AA0

##### USB A2 PC adapter

For connecting a programming device/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery

6GK1571-0BA00-0AA0

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Compact CPUs

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Ordering data	Article No.	Article No.
<b>PROFIBUS DP RS 485 bus connector</b> <ul style="list-style-type: none"> <li>With 90° cable outlet, max. transfer rate 12 Mbps           <ul style="list-style-type: none"> <li>Without programming device interface</li> <li>With programming device interface</li> </ul> </li> <li>With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps           <ul style="list-style-type: none"> <li>Without programming device interface, 1 unit</li> <li>Without programming device interface, 100 units</li> <li>With programming device interface, 1 unit</li> <li>With programming device interface, 100 units</li> </ul> </li> <li>With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS</li> </ul>	<b>6ES7972-0BA12-0XA0</b>  <b>6ES7972-0BB12-0XA0</b>  <b>6ES7972-0BA52-0XA0</b>  <b>6ES7972-0BA52-0XB0</b>  <b>6ES7972-0BB52-0XA0</b>  <b>6ES7972-0BB52-0XB0</b>  <b>6GK1500-0EA02</b>	<b>6GK5204-2BB10-2AA3</b>
<b>PROFIBUS FastConnect bus cable</b>  Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1830-0EH10</b>	<b>SCALANCE X204-2 Industrial Ethernet Switch</b>  Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports
<b>RS 485 repeater for PROFIBUS</b>  Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	<b>6ES7972-0AA02-0XA0</b>	<b>Compact Switch Module CSM 377</b>  Unmanaged switch for connecting SIMATIC S7-300, ET 200M and up to three other stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM
<b>PROFINET bus components</b>		<b>6GK7377-1AA00-0AA0</b>
<b>IE FC TP standard cable GP 2x2</b>  4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval;  Sold by the meter: Max. delivery unit 1000 m Minimum order quantity 20 m	<b>6XV1840-2AH10</b>	<b>IE FC RJ45 plugs</b>  RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables
<b>FO standard cable GP (50/125)</b>  Standard cable, splittable, UL approval, sold by the meter Max. delivery unit 1000 m Minimum order quantity 20 m	<b>6XV1873-2A</b>	<b>IE FC RJ45 plug 180</b>  180° cable outlet  1 unit  10 units  50 units
		<b>6GK1901-1BB10-2AA0</b>  <b>6GK1901-1BB10-2AB0</b>  <b>6GK1901-1BB10-2AE0</b>
		<b>PROFIBUS/PROFINET bus components</b>  For establishing MPI/PROFIBUS/PROFINET communication
		See Industry Mall

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Compact CPUs

#### Technical specifications

Article number	6ES7312-5BF04-0AB0 CPU312C, 10DI/6DO, 64 KB	6ES7313-5BG04-0AB0 CPU313C, 24DI/16DO/5AI/2AO, 128 KB	6ES7313-6BG04-0AB0 CPU313C-2 PTP, 16DI/16DO, 128 KB	6ES7313-6CG04-0AB0 CPU313C-2 DP, 16DI/16DO, 128 KB
<b>Engineering with</b>				
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP 7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 204	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	24 V
<b>Memory</b>				
<b>Work memory</b>				
• integrated	64 kbyte	128 kbyte	128 kbyte	128 kbyte
• expandable	No	No	No	No
<b>Load memory</b>				
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>				
for bit operations, typ.	0.1 µs	0.07 µs	0.07 µs	0.07 µs
for word operations, typ.	0.24 µs	0.15 µs	0.15 µs	0.15 µs
for fixed point arithmetic, typ.	0.32 µs	0.2 µs	0.2 µs	0.2 µs
for floating point arithmetic, typ.	1.1 µs	0.72 µs	0.72 µs	0.72 µs
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	256	256	256	256
<b>IEC counter</b>				
• present	Yes	Yes	Yes	Yes
<b>S7 times</b>				
• Number	256	256	256	256
<b>IEC timer</b>				
• present	Yes	Yes	Yes	Yes
<b>Data areas and their retentivity</b>				
<b>Flag</b>				
• Size, max.	256 byte	256 byte	256 byte	256 byte
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	1 024 byte	1 024 byte	1 024 byte	2 048 byte
• Outputs	1 024 byte	1 024 byte	1 024 byte	2 048 byte
<b>Process image</b>				
• Inputs, adjustable	1 024 byte	1 024 byte	1 024 byte	2 048 byte
• Outputs, adjustable	1 024 byte	1 024 byte	1 024 byte	2 048 byte
<b>Time of day</b>				
<b>Clock</b>				
• Hardware clock (real-time)		Yes	Yes	Yes
• Software clock	Yes			
<b>Operating hours counter</b>				
• Number	1	1	1	1
<b>Digital inputs</b>				
integrated channels (DI)	10	24	16	16
<b>Digital outputs</b>				
integrated channels (DO)	6	16	16	16
<b>Analog inputs</b>				
integrated channels (AI)	0	5; 4x current/voltage, 1x resistance	0	0
<b>Input ranges</b>				
• Voltage		Yes; ±10 V / 100 kΩ; 0 V to 10 V / 100 kΩ		
• Current		Yes; ±20 mA / 100 Ω; 0 mA to 20 mA / 100 Ω; 4 mA to 20 mA / 100 Ω		
• Resistance thermometer		Yes; Pt 100 / 10 MΩ		
• Resistance		Yes; 0 Ω to 600 Ω / 10 MΩ		



### Technical specifications

Article number	6ES7312-5BF04-0AB0 CPU312C, 10DI/6DO, 64 KB	6ES7313-5BG04-0AB0 CPU313C, 24DI/16DO/5AI/2AO, 128 KB	6ES7313-6BG04-0AB0 CPU313C-2 PTP, 16DI/16DO, 128 KB	6ES7313-6CG04-0AB0 CPU313C-2 DP, 16DI/16DO, 128 KB
<b>Analog outputs</b>				
integrated channels (AO)	0	2	0	0
<b>Output ranges, voltage</b>				
• 0 to 10 V		Yes		
• -10 V to +10 V		Yes		
<b>Output ranges, current</b>				
• 0 to 20 mA		Yes		
• -20 mA to +20 mA		Yes		
• 4 mA to 20 mA		Yes		
<b>1. Interface</b>				
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
<b>Interface types</b>				
• RS 485	Yes	Yes		Yes
<b>Protocols</b>				
• MPI	Yes	Yes	Yes	Yes
• PROFIBUS DP master	No	No	No	No
• PROFIBUS DP slave	No	No	No	No
• Point-to-point connection	No	No	No	No
<b>2. Interface</b>				
Interface type			Integrated RS 422/ 485 interface	Integrated RS 485 interface
<b>Interface types</b>				
• RS 485			Yes; RS 422 / 485 (X.27)	Yes
<b>Protocols</b>				
• MPI			No	No
• PROFINET IO Controller			No	No
• PROFINET IO Device			No	No
• PROFINET CBA			No	No
• PROFIBUS DP master			No	Yes
• PROFIBUS DP slave			No	Yes
<b>PROFIBUS DP master</b>				
• Number of DP slaves, max.				124
<b>Communication functions</b>				
PG/OP communication	Yes	Yes	Yes	Yes
Data record routing	No	No	No	Yes
<b>Global data communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S7 basic communication</b>				
• supported	Yes	Yes	Yes; Server	Yes
<b>S7 communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S5 compatible communication</b>				
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Number of connections</b>				
• overall	6	8	8	8
<b>Integrated Functions</b>				
Frequency measurement	Yes	Yes	Yes	Yes
• Number of frequency meters	2; up to 10 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)
controlled positioning	No	No	No	No
integrated function blocks (closed-loop control)	No	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)
PID controller	No	Yes	Yes	Yes
Number of pulse outputs	2; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz	2.5 kHz	2.5 kHz	2.5 kHz

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Compact CPUs

#### Technical specifications

Article number	<b>6ES7312-5BF04-0AB0</b> CPU312C, 10DI/6DO, 64 KB	<b>6ES7313-5BG04-0AB0</b> CPU313C, 24DI/16DO/5AI/2AO, 128 KB	<b>6ES7313-6BG04-0AB0</b> CPU313C-2 PTP, 16DI/16DO, 128 KB	<b>6ES7313-6CG04-0AB0</b> CPU313C-2 DP, 16DI/16DO, 128 KB
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C
<b>Configuration</b>				
<b>Programming</b>				
<b>Programming language</b>				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes
<b>Know-how protection</b>				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>				
Width	80 mm	120 mm	80 mm	80 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm
<b>Weights</b>				
Weight, approx.	410 g	660 g	500 g	500 g
Article number	<b>6ES7314-6BH04-0AB0</b> CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6CH04-0AB0</b> CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6EH04-0AB0</b> CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB	
<b>General information</b>				
<b>Product function</b>				
• Isochronous mode			Yes; For PROFINET only	
<b>Engineering with</b>				
• Programming package	STEP 7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 204	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP 7 V5.5 or higher with HSP 191	
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	
<b>Memory</b>				
<b>Work memory</b>				
• integrated	192 kbyte	192 kbyte	192 kbyte	
• expandable	No	No	No	
<b>Load memory</b>				
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	
<b>CPU processing times</b>				
for bit operations, typ.	0.06 µs	0.06 µs	0.06 µs	
for word operations, typ.	0.12 µs	0.12 µs	0.12 µs	
for fixed point arithmetic, typ.	0.16 µs	0.16 µs	0.16 µs	
for floating point arithmetic, typ.	0.59 µs	0.59 µs	0.59 µs	
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	256	256	256	
<b>IEC counter</b>				
• present	Yes	Yes	Yes	
<b>S7 times</b>				
• Number	256	256	256	
<b>IEC timer</b>				
• present	Yes	Yes	Yes	

### Technical specifications

Article number	6ES7314-6BH04-0AB0 CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	6ES7314-6CH04-0AB0 CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	6ES7314-6EH04-0AB0 CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	256 byte	256 byte	256 byte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	1 024 byte	2 048 byte	2 048 byte
• Outputs	1 024 byte	2 048 byte	2 048 byte
<b>Process image</b>			
• Inputs, adjustable	1 024 byte	2 048 byte	2 048 byte
• Outputs, adjustable	1 024 byte	2 048 byte	2 048 byte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	1	1	1
<b>Digital inputs</b>			
integrated channels (DI)	24	24	24
<b>Digital outputs</b>			
integrated channels (DO)	16	16	16
<b>Analog inputs</b>			
integrated channels (AI)	5; 4x current/voltage, 1x resistance	5; 4x current/voltage, 1x resistance	5; 4x current/voltage, 1x resistance
<b>Input ranges</b>			
• Voltage	Yes; $\pm 10\text{ V} / 100\text{ k}\Omega$ ; 0 V to 10 V / 100 k $\Omega$	Yes; $\pm 10\text{ V} / 100\text{ k}\Omega$ ; 0 V to 10 V / 100 k $\Omega$	Yes; $\pm 10\text{ V} / 100\text{ k}\Omega$ ; 0 V to 10 V / 100 k $\Omega$
• Current	Yes; $\pm 20\text{ mA} / 100\ \Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$	Yes; $\pm 20\text{ mA} / 100\ \Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$	Yes; $\pm 20\text{ mA} / 100\ \Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$
• Resistance thermometer	Yes; Pt 100 / 10 M $\Omega$	Yes; Pt 100 / 10 M $\Omega$	Yes; Pt 100 / 10 M $\Omega$
• Resistance	Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$	Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$	Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$
<b>Analog outputs</b>			
integrated channels (AO)	2	2	2
<b>Output ranges, voltage</b>			
• 0 to 10 V	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes
<b>Output ranges, current</b>			
• 0 to 20 mA	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
<b>1. Interface</b>			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
<b>Interface types</b>			
• RS 485	Yes	Yes	Yes
<b>Protocols</b>			
• MPI	Yes	Yes	Yes
• PROFIBUS DP master	No	No	Yes
• PROFIBUS DP slave	No	No	Yes
• Point-to-point connection	No	No	No
<b>PROFIBUS DP master</b>			
• Number of DP slaves, max.			124

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Compact CPUs

#### Technical specifications

Article number	<b>6ES7314-6BH04-0AB0</b> CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6CH04-0AB0</b> CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6EH04-0AB0</b> CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
<b>2. Interface</b>			
Interface type	Integrated RS 422/ 485 interface	Integrated RS 485 interface	
<b>Interface types</b>			
• RJ 45 (Ethernet)			Yes
• RS 485	Yes; RS 422 / 485 (X.27)	Yes	
• Number of ports			2
<b>Protocols</b>			
• MPI	No	No	No
• PROFINET IO Controller	No	No	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	No	No	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	No	No	Yes
• PROFIBUS DP master	No	Yes	No
• PROFIBUS DP slave	No	Yes	No
<b>PROFIBUS DP master</b>			
• Number of DP slaves, max.		124	
<b>PROFINET IO Controller</b>			
<b>Services</b>			
- Number of connectable IO Devices, max.			128
- Of which IO devices with IRT, max.			64
- Number of IO Devices with IRT and the option "high flexibility"			128
- Number of connectable IO Devices for RT, max.			128
<b>Protocols</b>			
<b>Open IE communication</b>			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
• ISO-on-TCP (RFC1006)			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
• UDP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
<b>Web server</b>			
• supported			Yes
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	No	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5 compatible communication</b>			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Number of connections</b>			
• overall	12	12	12

### Technical specifications

Article number	<b>6ES7314-6BH04-0AB0</b> CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6CH04-0AB0</b> CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6EH04-0AB0</b> CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
<b>Integrated Functions</b>			
Frequency measurement	Yes	Yes	Yes
• Number of frequency meters	4; up to 60 kHz (see "Technological Functions" manual)	4; up to 60 kHz (see "Technological Functions" manual)	4; up to 60 kHz (see "Technological Functions" manual)
controlled positioning	Yes	Yes	Yes
integrated function blocks (closed-loop control)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)
PID controller	Yes	Yes	Yes
Number of pulse outputs	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz	2.5 kHz	2.5 kHz
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/ password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	120 mm	120 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
<b>Weights</b>			
Weight, approx.	680 g	680 g	730 g

## SIMATIC S7-300 Advanced Controllers

### Central processing units

#### SIPLUS S7-300 compact CPUs

##### Overview SIPLUS CPU 312C



- The compact CPU with integral digital inputs/outputs
- For small applications with increased processing performance requirements
- With technological functions

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

##### Overview SIPLUS CPU 313C-2 DP



- The compact CPU with integral digital inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/O

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

##### Overview SIPLUS CPU 313C



- The compact CPU with integrated digital and analog inputs/outputs
- For plants with high processing performance and response time requirements
- With technological functions

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

##### Overview SIPLUS CPU 314C-2 PtP



- The compact CPU with integrated digital and analog inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Overview SIPLUS CPU 314C-2 DP



- The compact CPU with integral digital and analog inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/O

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Overview SIPLUS CPU 314C-2 PN/DP



- The compact CPU with integral digital and analog inputs/outputs and technological functions
- High processing performance in binary and floating-point arithmetic
- For connecting distributed I/O via PROFIBUS and PROFINET
- Combined MPI/PROFIBUS DP master/slave interface
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Component based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Isochronous mode on PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### SIPLUS S7-300 compact CPUs

#### Ordering data

#### Article No.

#### Article No.

##### SIPLUS S7-300 CPU 312C

*For industrial applications with extended ambient conditions*

Compact CPU, 64 KB work memory, supply voltage 24 V DC, 10 DI/6 DO integrated, integrated functions, MPI; including slot number labels; MMC required

Extended temperature range and exposure to media

**6AG1312-5BF04-7AB0**

##### SIPLUS S7-300 CPU 313C

*For industrial applications with extended ambient conditions*

Compact CPU, 128 KB work memory, 24 V DC supply voltage, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI; MMC required

Extended temperature range and exposure to media

**6AG1313-5BG04-7AB0**

##### SIPLUS S7-300 CPU 313C-2 DP

*For industrial applications with extended ambient conditions*

Compact CPU, 128 KB work memory, supply voltage 24 V DC, 16 DI/16 DO integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required

Extended temperature range and exposure to media

**6AG1313-6CG04-7AB0**

##### SIPLUS S7-300 CPU 314C-2 PIP

*For industrial applications with extended ambient conditions*

Compact CPU, 192 KB work memory, 24 V DC supply voltage, 24DI/16DQ/4AI/2AQ integrated, integrated functions, MPI, RS 422/485 interface; MMC required

Extended temperature range and exposure to media

**6AG1314-6BH04-7AB0**

##### SIPLUS S7-300 CPU 314C-2 DP

*For industrial applications with extended ambient conditions*

Compact CPU, 192 KB work memory, 24 V DC supply voltage, 24 DI/16 DQ/4 AI/2 AQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required

Extended temperature range and exposure to media

**6AG1314-6CH04-7AB0**

##### SIPLUS S7-300 CPU 314C-2 PN/DP

*For industrial applications with extended ambient conditions*

Compact CPU, 192 KB work memory, 24 V DC supply voltage, 24 DI/16 DQ/4 AI/2 AQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; PROFINET IO controller/I-Device interface, MMC required

Extended temperature range and exposure to media

**6AG1314-6EH04-7AB0**

#### Accessories

*Mandatory*

##### SIMATIC Micro Memory Card

64 KB

**6ES7953-8LF31-0AA0**

128 KB

**6ES7953-8LG31-0AA0**

512 KB

**6ES7953-8LJ31-0AA0**

2 MB

**6ES7953-8LL31-0AA0**

4 MB

**6ES7953-8LM32-0AA0**

8 MB

**6ES7953-8LP31-0AA0**

#### Front connector (1 unit)

For compact CPUs

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**

**6ES7392-1BM01-1AB0**

*For communication within the application*

#### PROFIBUS DP RS 485 bus connector

(extended temperature range and exposure to media)

With 90° cable outlet, max. transfer rate 12 Mbps

- Without programming device interface
- With programming device interface

**6AG1972-0BA12-2XA0**

**6AG1972-0BB12-2XA0**

With angled cable outlet, max. transmission rate 12 Mbps

- Without programming device interface
- With programming device interface

**6AG1972-0BA42-7XA0**

**6AG1972-0BB42-7XA0**

(Extended temperature range)

With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS

**6AG1500-0EA02-2AA0**

#### IE FC RJ45 plug 180

(extended temperature range and exposure to media)

180° cable outlet

- 1 unit

**6AG1901-1BB10-7AA0**



# SIMATIC S7-300 Advanced Controllers

## Central processing units

### SIPLUS S7-300 compact CPUs

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Ordering data	Article No.	Article No.
<b>SIPLUS SCALANCE XC-200 Industrial Ethernet Switches</b> Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager; incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM Extended temperature range and exposure to media Switches with PROFINET delivery state • <b>SIPLUS SCALANCE XC206-2 (ST/BFOC)</b> with six RJ45 ports 10/100 Mbps and two ST/BFOC ports 100 Mbps	<b>6AG1206-2BB00-7AC2</b>	<i>For commissioning</i> <b>MPI cable</b> For connection of SIMATIC S7 and programming device via MPI; length 5 m <b>6ES7901-0BF00-0AA0</b> <b>USB A2 PC adapter</b> For connecting a programming device/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery <b>6GK1571-0BA00-0AA0</b> <i>Consumables</i> <b>Front door, elevated design</b> For compact CPUs; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labeling strips in petrol <b>6ES7328-7AA20-0AA0</b> <b>Power supply connector</b> 10 units, spare part <b>6ES7391-1AA00-0AA0</b> <b>Slot number plates</b> <b>6ES7912-0AA00-0AA0</b> <b>Labeling strips</b> 10 units, spare part <b>6ES7392-2XX00-0AA0</b> <b>Label cover</b> 10 units, spare part <b>6ES7392-2XY00-0AA0</b> <b>Labeling sheets for machine inscription</b> For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units Petrol <b>6ES7392-2AX10-0AA0</b> Light beige <b>6ES7392-2BX10-0AA0</b> Yellow <b>6ES7392-2CX10-0AA0</b> Red <b>6ES7392-2DX10-0AA0</b> <i>Documentation</i> <b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC <b>6ES7998-8XC01-8YE0</b> <b>SIMATIC Manual Collection update service for 1 year</b> <b>6ES7998-8XC01-8YE2</b> Current Manual Collection DVD and the three subsequent updates
<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1830-0EH10</b>	
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter: Max. delivery unit 1000 m Minimum order quantity 20 m	<b>6XV1840-2AH10</b>	
<b>FO standard cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter: max. delivery unit 1 000 m minimum order quantity 20 m	<b>6XV1873-2A</b>	
<b>RS 485 repeater for PROFIBUS</b> (extended temperature range and exposure to media) Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	<b>6AG1972-0AA02-7XA0</b>	
<b>Point-to-point link cable</b> For connection to CPU 31xC-2 PtP 5 m 10 m 50 m	<b>6ES7902-3AB00-0AA0</b> <b>6ES7902-3AC00-0AA0</b> <b>6ES7902-3AG00-0AA0</b>	

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### SIPLUS S7-300 compact CPUs

#### Technical specifications

Article number	6AG1312-5BF04-7AB0	6AG1313-5BG04-7AB0
Based on	6ES7312-5BF04-0AB0 SIPLUS S7-300 CPU312C	6ES7313-5BG04-0AB0 SIPLUS S7-300 CPU313C
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

### Technical specifications

Article number	<b>6AG1313-6CG04-7AB0</b>	<b>6AG1314-6BH04-7AB0</b>
Based on	<b>6ES7313-6CG04-0AB0</b> SIPLUS S7-300 CPU313C-2DP	<b>6ES7314-6BH04-0AB0</b> SIPLUS S7-300 CPU314C-2 PtP
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086		Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7		Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A		Yes; Conformal coating, Class A

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### SIPLUS S7-300 compact CPUs

#### Technical specifications

Article number	<b>6AG1314-6CH04-7AB0</b>	<b>6AG1314-6EH04-7AB0</b>
Based on	<b>6ES7314-6CH04-0AB0</b> SIPLUS S7-300 CPU314C-2DP	<b>6ES7314-6EH04-0AB0</b> SIPLUS S7-300 CPU314C-2PN/DP
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; @ 60°C for UL/ATEX/FM use
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

## SIMATIC S7-300 Advanced Controllers

### Central processing units

#### Fail-safe CPUs

#### Overview CPU 315F-2 DP



- Based on the SIMATIC CPU 315-2 DP
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Distributed fail-safe I/O modules can be connected locally via the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules can also be centrally connected
- Central and distributed use of standard modules for non safety-oriented applications

SIMATIC Micro Memory Card required for operation of CPU.

#### Overview CPU 315F-2 PN/DP



- Based on CPU 315-2 PN/DP
- The CPU with medium-sized program memory and quantity structures for setting up a fail-safe automation system in plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Distributed fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules can also be connected centrally

- Central and distributed use of standard modules for non safety-oriented applications
- Component Based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

#### Overview CPU 317F-2 PN/DP



- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Fail-safe I/O modules can be connected in a distributed configuration to both integral PROFIBUS DP interfaces (PROFIsafe)
- Fail-safe ET 200M I/O modules can also be connected centrally
- Central and distributed use of standard modules for non safety-oriented applications

SIMATIC Micro Memory Card required for operation of CPU.

## SIMATIC S7-300 Advanced Controllers

### Central processing units

#### Fail-safe CPUs

##### Overview CPU 317F-2 PN/DP



- Based on CPU 317-2 PN/DP
- The fail-safe CPU with a large program memory and quantity framework for demanding applications; for setting up a fail-safe automation system in plants with increased safety requirements.
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Distributed fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules
- can also be connected centrally
- Central and distributed use of standard modules for non safety-oriented applications
- Component-based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component-based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

##### Overview CPU 319F-3 PN/DP



- The fail-safe CPU with high-performance command processing, large program memory and large quantity structure for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to 13849.1
- Distributed fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe);
- Fail-safe ET 200M I/O modules can also be connected centrally
- Standard modules for non-safety-related applications can be operated centrally and locally
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- Isochronous mode on PROFIBUS
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

Ordering data	Article No.	Ordering data	Article No.
<b>CPU 315F-2 DP</b> CPU for SIMATIC S7-300F; 384 KB work memory, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface, incl. slot number labels; MMC required	6ES7315-6FF04-0AB0	<b>STEP 7 Safety Advanced V17</b> Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V17 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case. Floating license for 1 user; license key on USB flash drive Floating license for 1 user, license key for download <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FA17-0YA5</b>  <b>6ES7833-1FA17-0YH5</b>
<b>CPU 315F-2 PN/DP</b> CPU for SIMATIC S7-300F; 512 KB work memory, 24 V DC supply voltage; MPI/PROFIBUS DP master/slave interface; Industrial Ethernet/PROFINET interface; incl. slot number labels; MMC required	6ES7315-2FJ14-0AB0		
<b>CPU 317F-2 DP</b> 1.5 MB work memory, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required	6ES7317-6FF04-0AB0		
<b>CPU 317F-2 PN/DP</b> 1.5 MB work memory, supply voltage 24 V DC, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/ PROFINET interface; MMC required	6ES7317-2FK14-0AB0		
<b>CPU 319F-3 PN/DP</b> 2.5 MB work memory, supply voltage 24 V DC, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	6ES7318-3FL01-0AB0		
<b>S7 Distributed Safety V5.4 SP5            Update 2 programming tool</b> Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit) Windows 10 Professional/Enterprise (64-bit) Windows Server 2008 R2 SP1 (64-bit) Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit) STEP 7 from V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version Floating license for 1 user; software and documentation on DVD; license key on USB flash drive Floating license for 1 user; software, documentation and license key for download <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FC02-0YA5</b>  <b>6ES7833-1FC02-0YH5</b>	<b>SIMATIC Micro Memory Card</b> 64 KB 128 KB 512 KB 2 MB 4 MB 8 MB <b>MPI cable</b> For connection of SIMATIC S7 and programming device via MPI; length 5 m <b>Slot number plates</b> <b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7953-8LF31-0AA0</b> <b>6ES7953-8LG31-0AA0</b> <b>6ES7953-8LJ31-0AA0</b> <b>6ES7953-8LL31-0AA0</b> <b>6ES7953-8LM32-0AA0</b> <b>6ES7953-8LP31-0AA0</b> <b>6ES7901-0BF00-0AA0</b>
<b>S7 Distributed Safety upgrade</b> From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FC02-0YE5	<b>SIMATIC Manual Collection            update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates <b>Power supply connector</b> 10 units, spare part <b>USB A2 PC adapter</b> For connecting a programming device/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery	<b>6ES7998-8XC01-8YE2</b>  <b>6ES7391-1AA00-0AA0</b>  <b>6GK1571-0BA00-0AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Fail-safe CPUs

Ordering data	Article No.	Article No.
<b>PROFIBUS bus components</b>		
<b>PROFIBUS DP RS 485 bus connector</b>		
<ul style="list-style-type: none"> <li>With 90° cable outlet, max. transfer rate 12 Mbps               <ul style="list-style-type: none"> <li>Without programming device interface</li> <li>With programming device interface</li> </ul> </li> <li>With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps               <ul style="list-style-type: none"> <li>Without programming device interface, 1 unit</li> <li>Without programming device interface, 100 units</li> <li>With programming device interface, 1 unit</li> <li>With programming device interface, 100 units</li> </ul> </li> <li>With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS</li> </ul>	<b>6ES7972-0BA12-0XA0</b>  <b>6ES7972-0BB12-0XA0</b>  <b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b> <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b>  <b>6GK1500-0EA02</b>	
<b>PROFIBUS FastConnect bus cable</b>	<b>6XV1830-0EH10</b>	
Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m		
<b>RS 485 repeater for PROFIBUS</b>	<b>6ES7972-0AA02-0XA0</b>	
Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure		
<b>PROFINET bus components</b>		
<b>IE FC TP standard cable GP 2x2</b>	<b>6XV1840-2AH10</b>	
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter		
<b>FO standard cable GP (50/125)</b>	<b>6XV1873-2A</b>	
Standard cable, splittable, UL approval, sold by the meter		
		<b>SCALANCE X204-2 Industrial Ethernet Switch</b>
		Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports
		<b>Compact Switch Module CSM 377</b>
		Unmanaged switch for connecting SIMATIC S7-300, ET 200M and up to three other stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM
		<b>IE FC RJ45 plugs</b>
		RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables
		<b>IE FC RJ45 plug 145</b>
		145° cable outlet
		1 unit
		10 units
		50 units
		<b>IE FC RJ45 plug 180</b>
		180° cable outlet
		1 unit
		10 units
		50 units
		<b>PROFIBUS/PROFINET bus components</b>
		See Industry Mall
		For establishing MPI/PROFIBUS/PROFINET communication
		<b>6GK5204-2BB10-2AA3</b>
		<b>6GK7377-1AA00-0AA0</b>
		<b>6GK1901-1BB30-0AA0</b>
		<b>6GK1901-1BB30-0AB0</b>
		<b>6GK1901-1BB30-0AE0</b>
		<b>6GK1901-1BB10-2AA0</b>
		<b>6GK1901-1BB10-2AB0</b>
		<b>6GK1901-1BB10-2AE0</b>

### Technical specifications

Article number	<b>6ES7315-6FF04-0AB0</b>	<b>6ES7315-2FJ14-0AB0</b>	<b>6ES7317-6FF04-0AB0</b>	<b>6ES7317-2FK14-0AB0</b>	<b>6ES7318-3FL01-0AB0</b>
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
<b>General information</b>					
<b>Product function</b>					
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	Yes	Yes; Via PROFIBUS DP or PROFINET interface		Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via 2nd PROFIBUS DP or PROFINET interface
<b>Engineering with</b>					
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218 + Distributed Safety	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 202 + Distributed Safety	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4
<b>Supply voltage</b>					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V



### Technical specifications

Article number	6ES7315-6FF04-0AB0	6ES7315-2FJ14-0AB0	6ES7317-6FF04-0AB0	6ES7317-2FK14-0AB0	6ES7318-3FL01-0AB0
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
<b>Memory</b>					
<b>Work memory</b>					
• integrated	384 kbyte	512 kbyte	1 536 kbyte	1 536 kbyte	2 560 kbyte
• expandable	No	No	No	No	No
<b>Load memory</b>					
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>					
for bit operations, typ.	0.05 µs	0.05 µs	0.025 µs	0.025 µs	0.004 µs
for word operations, typ.	0.09 µs	0.09 µs	0.03 µs	0.03 µs	0.01 µs
for fixed point arithmetic, typ.	0.12 µs	0.12 µs	0.04 µs	0.04 µs	0.01 µs
for floating point arithmetic, typ.	0.45 µs	0.45 µs	0.16 µs	0.16 µs	0.04 µs
<b>Counters, timers and their retentivity</b>					
<b>S7 counter</b>					
• Number	256	256	512	512	2 048
<b>IEC counter</b>					
• present	Yes	Yes	Yes	Yes	Yes
<b>S7 times</b>					
• Number	256	256	512	512	2 048
<b>IEC timer</b>					
• present	Yes	Yes	Yes	Yes	Yes
<b>Data areas and their retentivity</b>					
<b>Flag</b>					
• Size, max.	2 048 byte	2 048 byte	4 096 byte	4 096 byte	8 192 byte
<b>Address area</b>					
<b>I/O address area</b>					
• Inputs	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
• Outputs	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
<b>Process image</b>					
• Inputs, adjustable	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
• Outputs, adjustable	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
<b>Time of day</b>					
<b>Clock</b>					
• Hardware clock (real-time)	Yes	Yes	Yes	Yes	Yes
<b>Operating hours counter</b>					
• Number	1	1	4	4	4
<b>1. Interface</b>					
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
<b>Interface types</b>					
• RS 485	Yes	Yes	Yes	Yes	Yes
<b>Protocols</b>					
• MPI	Yes	Yes	Yes	Yes	Yes
• PROFIBUS DP master	No	Yes	Yes	Yes	Yes
• PROFIBUS DP slave	No	Yes	Yes; A DP slave at both interfaces simultaneously is not possible	Yes	Yes; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No	No	No	No	No
<b>PROFIBUS DP master</b>					
• Number of DP slaves, max.		124	124	124	124

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Fail-safe CPUs

#### Technical specifications

Article number	6ES7315-6FF04-0AB0	6ES7315-2FJ14-0AB0	6ES7317-6FF04-0AB0	6ES7317-2FK14-0AB0	6ES7318-3FL01-0AB0
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
<b>2. Interface</b>					
Interface type	Integrated RS 485 interface		Integrated RS 485 interface		Integrated RS 485 interface
<b>Interface types</b>					
<ul style="list-style-type: none"> <li>• RJ 45 (Ethernet)</li> <li>• RS 485</li> <li>• Number of ports</li> </ul>	Yes	Yes	Yes	Yes	Yes
<b>Protocols</b>					
<ul style="list-style-type: none"> <li>• MPI</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• PROFINET CBA</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> </ul>	No	No	No	No	No
		Yes; Also simultaneously with IO-Device functionality		Yes; Also simultaneously with IO-Device functionality	No
		Yes; Also simultaneously with IO Controller functionality		Yes; Also simultaneously with IO Controller functionality	No
	Yes	Yes	Yes	No	Yes
	Yes	No	Yes; A DP slave at both interfaces simultaneously is not possible	No	Yes; A DP slave at both interfaces simultaneously is not possible
<b>PROFIBUS DP master</b>					
• Number of DP slaves, max.	124; Per station		124		124
<b>PROFINET IO Controller</b>					
<b>Services</b>					
- Number of connectable IO Devices, max.		128		128	
- Of which IO devices with IRT, max.		64		64	
- Number of IO Devices with IRT and the option "high flexibility"		128		128	
- Number of connectable IO Devices for RT, max.		128		128	
<b>3. Interface</b>					
<b>Interface types</b>					
<ul style="list-style-type: none"> <li>• RJ 45 (Ethernet)</li> <li>• Number of ports</li> </ul>					Yes
					2
<b>Protocols</b>					
<ul style="list-style-type: none"> <li>• MPI</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• PROFINET CBA</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> </ul>					No
					Yes; Also simultaneously with I-Device functionality
					Yes; Also simultaneously with IO Controller functionality
					Yes
					No
					No
<b>PROFINET IO Controller</b>					
<b>Services</b>					
- Number of connectable IO Devices, max.					256
- Of which IO devices with IRT, max.					64
- Number of IO Devices with IRT and the option "high flexibility"					256
- Number of connectable IO Devices for RT, max.					256

### Technical specifications

Article number	6ES7315-6FF04-0AB0	6ES7315-2FJ14-0AB0	6ES7317-6FF04-0AB0	6ES7317-2FK14-0AB0	6ES7318-3FL01-0AB0
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
<b>Protocols</b>					
<b>Open IE communication</b>					
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
• ISO-on-TCP (RFC1006)		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
• UDP		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
<b>Web server</b>					
• supported		Yes; only read function		Yes	Yes
<b>Communication functions</b>					
PG/OP communication	Yes	Yes	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes	Yes	Yes
<b>Global data communication</b>					
• supported	Yes	Yes	Yes	Yes	Yes
<b>S7 basic communication</b>					
• supported	Yes	Yes	Yes	Yes	Yes
<b>S7 communication</b>					
• supported	Yes	Yes	Yes	Yes	Yes
<b>S5 compatible communication</b>					
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Number of connections</b>					
• overall	16	16	32	32	32
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• min.	0 °C	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C	60 °C
<b>Configuration</b>					
<b>Programming</b>					
<b>Programming language</b>					
- LAD	Yes	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes
- CFC	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes	Yes
<b>Know-how protection</b>					
• User program protection/ password protection	Yes	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>					
Width	40 mm	40 mm	40 mm	40 mm	120 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm	130 mm
<b>Weights</b>					
Weight, approx.	290 g	340 g	360 g	340 g	1 250 g

## SIMATIC S7-300 Advanced Controllers

### Central processing units

#### SIPLUS S7-300 fail-safe CPUs

##### Overview SIPLUS CPU 315F-2 DP



- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the integral PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules are also centrally connectable
- The standard modules for non-safety applications can be operated both centrally and locally

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

##### Overview SIPLUS CPU 315F-2 PN/DP



- The CPU with a medium sized program memory and quantity structures to build a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e in accordance with ISO 13849 and up to Cat. 4 of EN 954-1
- The fail-safe I/O modules can be locally connected to the integrated PROFINET interface (PROFIsafe) and/or to the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules are also centrally connectable
- The standard modules for non-safety applications can be operated both centrally and locally
- Component Based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Overview SIPLUS CPU 317F-2 DP



- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration to both integral PROFIBUS DP interfaces (PROFIsafe)
- Fail-safe ET 200M I/O modules are also centrally connectable
- The standard modules for non-safety applications can be operated both centrally and locally

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Overview SIPLUS CPU 317F-2 PN/DP



- The failsafe CPU with a large program memory and quantity structures for demanding applications to build a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e in accordance with ISO 13849-1 and up to category 4 of EN 954-1
- The fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules are also centrally connectable
- The standard modules for non-safety applications can be operated both centrally and locally
- Component Based Automation (CBA) on PROFINET
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### SIPLUS S7-300 fail-safe CPUs

#### Ordering data

#### Article No.

#### Article No.

#### SIPLUS S7-300 CPU 315F-2 DP

For industrial applications with extended ambient conditions

CPU for SIPLUS S7-300F; 384 KB work memory, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; incl. slot number labels; MMC required

Extended temperature range and exposure to media

6AG1315-6FF04-2AB0

#### SIPLUS S7-300 CPU 315F-2 PN/DP

For industrial applications with extended ambient conditions

CPU for SIPLUS S7-300F; 512 KB work memory, supply voltage 24 V DC, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/PROFINET interface; incl. slot number labels

Extended temperature range and exposure to media

6AG1315-2FJ14-2AB0

#### SIPLUS S7-300 CPU 317F-2 DP

For industrial applications with extended ambient conditions

CPU for SIPLUS S7-300F, 1.5 MB work memory, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required

Extended temperature range and exposure to media

6AG1317-6FF04-2AB0

#### SIPLUS S7-300 CPU 317F-2 PN/DP

For industrial applications with extended ambient conditions

CPU for SIPLUS S7-300F, 1.5 MB work memory, supply voltage 24 V DC, MPI/PROFIBUS DP master/slave interface; Industrial Ethernet/PROFINET interface; MMC required

Extended temperature range and exposure to media

6AG1317-2FK14-2AB0

#### Accessories

##### Mandatory

#### SIMATIC Micro Memory Card

64 KB

6ES7953-8LF31-0AA0

128 KB

6ES7953-8LG31-0AA0

512 KB

6ES7953-8LJ31-0AA0

2 MB

6ES7953-8LL31-0AA0

4 MB

6ES7953-8LM32-0AA0

8 MB

6ES7953-8LP31-0AA0

For communication within the application

#### PROFIBUS DP RS 485 bus connector

(extended temperature range and exposure to media)

With 90° cable outlet, max. transfer rate 12 Mbps

- Without programming device interface
- With programming device interface

6AG1972-0BA12-2XA0

6AG1972-0BB12-2XA0

With angled cable outlet, max. transmission rate 12 Mbps

- Without programming device interface
- With programming device interface

6AG1972-0BA42-7XA0

6AG1972-0BB42-7XA0

(Extended temperature range)

With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS

6AG1500-0EA02-2AA0

#### RS 485 repeater for PROFIBUS

6AG1972-0AA02-7XA0

(extended temperature range and exposure to media)

Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure

#### IE FC RJ45 plug 180

(extended temperature range and exposure to media)

180° cable outlet

- 1 unit

6AG1901-1BB10-7AA0

#### SIPLUS SCALANCE XC-200 Industrial Ethernet Switches

Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager; incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM

Extended temperature range and exposure to media

Switches with PROFINET delivery state

- **SIPLUS SCALANCE XC206-2 (ST/BFOC)** with six RJ45 ports 10/100 Mbps and two ST/BFOC ports 100 Mbps

6AG1206-2BB00-7AC2

#### PROFIBUS FastConnect bus cable

6XV1830-0EH10

Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m

#### IE FC TP standard cable GP 2x2

6XV1840-2AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter

#### FO standard cable GP (50/125)

6XV1873-2A

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### SIPLUS S7-300 fail-safe CPUs

Ordering data	Article No.	Ordering data	Article No.
<i>For commissioning</i>		<i>Consumables</i>	
<b>MPI cable</b> For connection of SIMATIC S7 and programming device via MPI; length 5 m	<b>6ES7901-0BF00-0AA0</b>	<b>Power supply connector</b> 10 units, spare part	<b>6ES7391-1AA00-0AA0</b>
<b>USB A2 PC adapter</b> For connecting a programming device/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery	<b>6GK1571-0BA00-0AA0</b>	<b>Slot number plates</b>	<b>6ES7912-0AA00-0AA0</b>
<b>S7 Distributed Safety V5.4 SP5 Update 2 programming tool</b> <b>Task:</b> Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP <b>Requirement:</b> Windows 7 SP1 (64-bit) Windows 10 Professional/Enterprise (64-bit) Windows Server 2008 R2 SP1 (64-bit) Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit) STEP 7 from V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version  Floating license for 1 user; software and documentation on DVD; license key on USB flash drive  Floating license for 1 user, software, documentation and license key for download <sup>1)</sup> ; e-mail address required for delivery	<b>6ES7833-1FC02-0YA5</b>  <b>6ES7833-1FC02-0YH5</b>	<i>Documentation</i> <b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>S7 Distributed Safety upgrade</b> From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	<b>6ES7833-1FC02-0YE5</b>	<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>STEP 7 Safety Advanced V17</b> <b>Task:</b> Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O <b>Requirement:</b> STEP 7 Professional V17 <b>Note:</b> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.  Floating license for 1 user; license key on USB flash drive  Floating license for 1 user, license key for download <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FA17-0YA5</b>  <b>6ES7833-1FA17-0YH5</b>		

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### SIPLUS S7-300 fail-safe CPUs

#### Technical specifications

Article number	6AG1315-6FF04-2AB0	6AG1315-2FJ14-2AB0
Based on	6ES7315-6FF04-0AB0 SIPLUS S7-300 CPU 315F-2DP	6ES7315-2FJ14-0AB0 SIPLUS S7-300 CPU315F-2PN/DP
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C	-25 °C; = Tmin
• max.	60 °C	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!



### Technical specifications

Article number	6AG1317-6FF04-2AB0	6AG1317-2FK14-2AB0
Based on	6ES7317-6FF04-0AB0 SIPLUS S7-300 CPU317F-2DP	6ES7317-2FK14-0AB0 SIPLUS S7-300 CPU317F-2PN/DP
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

## SIMATIC S7-300 Advanced Controllers

Central processing units

### Technology CPUs

#### Overview CPU 315T-3 PN/DP



- SIMATIC CPU with integral technology/motion control functionality
- With full standard CPU 315-2 PN/DP functionality (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7 Technology" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

#### Overview CPU 317T-3 PN/DP



- SIMATIC CPU with integral technology/motion control functionality
- With full standard CPU 317-2 PN/DP functionality (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7 Technology" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

### Overview CPU 317TF-3 PN/DP



- Fail-safe SIMATIC CPU 317TF-3 PN/DP with integral technology/motion control functionality
- Spare-part-compatible successor to the CPU 317TF-2 DP (Article No. 6ES7317-6TF14-0AB0)
- With full functionality of the standard CPU 317-2 PN/DP and CPU 317F-2 PN/DP (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7 Technology" option package required
- "S7 Distributed Safety" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

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### Ordering data

### Article No.

#### CPU 315T-3 PN/DP

384 KB work memory, 24 V DC supply voltage, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/Motion Control functions; MMC required

6ES7315-7TJ10-0AB0

#### CPU 317T-3 PN/DP

1024 KB work memory, 24 V DC supply voltage, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/Motion Control functions; MMC required

6ES7317-7TK10-0AB0

#### CPU 317TF-3 PN/DP

1.5 MB work memory, 24 V DC supply voltage, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/Motion Control functions; MMC required

6ES7317-7UL10-0AB0

#### S7-Technology V4.2

**Task:**  
Option package for configuring and programming technology tasks with SIMATIC S7 CPU 31xT and SIMATIC S7 CPU 317TF  
**Requirement:**  
STEP 7 V5.6 and higher  
**Type of delivery:**  
On DVD  
Incl. documentation for CPU 31xT, CPU 317TF (included on DVD)

#### Floating license

Floating license for 1 user; license key download without software or documentation<sup>1)</sup>; email address required for delivery

### Article No.

6ES7864-1CC42-0YA5

6ES7864-1CC42-0XH5

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Technology CPUs

Ordering data	Article No.	Ordering data	Article No.
<b>S7 Distributed Safety V5.4 SP5 Update 2 programming tool</b> Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used Floating license for 1 user; software and documentation on DVD; license key on USB flash drive Floating license for 1 user; software, documentation and license key for download <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FC02-0YA5</b>  <b>6ES7833-1FC02-0YH5</b>	<b>Power supply connector</b> 10 units, spare part <b>Labeling strips</b> 10 units, spare part <b>Label cover</b> 10 units, spare part <b>Labeling sheets for machine inscription</b> For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units Petrol <b>6ES7392-2AX10-0AA0</b> Light beige <b>6ES7392-2BX10-0AA0</b> Yellow <b>6ES7392-2CX10-0AA0</b> Red <b>6ES7392-2DX10-0AA0</b> <b>USB A2 PC adapter</b> <b>6GK1571-0BA00-0AA0</b> For connecting a programming device/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery	<b>6ES7391-1AA00-0AA0</b>  <b>6ES7392-2XX00-0AA0</b>  <b>6ES7392-2XY00-0AA0</b>  <b>6ES7392-2AX10-0AA0</b> <b>6ES7392-2BX10-0AA0</b> <b>6ES7392-2CX10-0AA0</b> <b>6ES7392-2DX10-0AA0</b>  <b>6GK1571-0BA00-0AA0</b>
<b>S7 Distributed Safety upgrade</b> From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	<b>6ES7833-1FC02-0YE5</b>	<b>PROFIBUS bus components</b> <b>PROFIBUS DP RS 485 bus connector</b> <ul style="list-style-type: none"> <li>With 90° cable outlet, max. transfer rate 12 Mbps               <ul style="list-style-type: none"> <li>Without programming device interface <b>6ES7972-0BA12-0XA0</b></li> <li>With programming device interface <b>6ES7972-0BB12-0XA0</b></li> </ul> </li> <li>With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps               <ul style="list-style-type: none"> <li>Without programming device interface, 1 unit <b>6ES7972-0BA52-0XA0</b></li> <li>Without programming device interface, 100 units <b>6ES7972-0BA52-0XB0</b></li> <li>With programming device interface, 1 unit <b>6ES7972-0BB52-0XA0</b></li> <li>With programming device interface, 100 units <b>6ES7972-0BB52-0XB0</b></li> </ul> </li> <li>With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS <b>6GK1500-0EA02</b></li> </ul>	
<b>SIMATIC Micro Memory Card</b> 8 MB	<b>6ES7953-8LP31-0AA0</b>		
<b>MPI cable</b> For connection of SIMATIC S7 and programming device via MPI; length 5 m	<b>6ES7901-0BF00-0AA0</b>		
<b>Front connector</b> 40-pin, with screw contacts <ul style="list-style-type: none"> <li>1 unit <b>6ES7392-1AM00-0AA0</b></li> <li>100 units <b>6ES7392-1AM00-1AB0</b></li> </ul> 40-pin, with spring-loaded contacts <ul style="list-style-type: none"> <li>1 unit <b>6ES7392-1BM01-0AA0</b></li> <li>100 units <b>6ES7392-1BM01-1AB0</b></li> </ul>			
<b>Slot number plates</b>	<b>6ES7912-0AA00-0AA0</b>		
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>		
<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>	<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m <b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	<b>6XV1830-0EH10</b>  <b>6ES7972-0AA02-0XA0</b>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Article No.
<b>PROFINET bus components</b>		
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 Outlet/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter	<b>6XV1840-2AH10</b>	
<b>FO standard cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	<b>6XV1873-2A</b>	
<b>SCALANCE X204-2 Industrial Ethernet Switch</b> Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>	
<b>Compact Switch Module CSM 377</b> Unmanaged switch for connecting SIMATIC S7-300, ET 200M and up to three other stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	<b>6GK7377-1AA00-0AA0</b>	
		<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables
		<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units
		<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication
		<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b> See Industry Mall

### Technical specifications

Article number	<b>6ES7315-7TJ10-0AB0</b>	<b>6ES7317-7TK10-0AB0</b>	<b>6ES7317-7UL10-0AB0</b>
	CPU315T-3 PN/DP, 384KB	CPU317T-3 PN/DP, 1024KB	CPU317TF-3 PN/DP, 1,5 MB
<b>General information</b>			
<b>Product function</b>			
• Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface
<b>Engineering with</b>			
• Programming package	STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3	STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3	STEP 7 V5.5 SP2 or higher; S7-Technology option package V4.2 SP3 or higher, Distributed Safety V5.4 SP5 or higher, S7-F Configuration Pack V5.5 SP10 or higher
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
<b>Memory</b>			
<b>Work memory</b>			
• integrated	384 kbyte	1 024 kbyte	1 536 kbyte
• expandable	No	No	No
<b>Load memory</b>			
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	0.05 µs	0.025 µs	0.025 µs
for word operations, typ.	0.09 µs	0.03 µs	0.03 µs
for fixed point arithmetic, typ.	0.12 µs	0.04 µs	0.04 µs
for floating point arithmetic, typ.	0.45 µs	0.16 µs	0.16 µs

# SIMATIC S7-300 Advanced Controllers

## Central processing units

### Technology CPUs

#### Technical specifications

Article number	<b>6ES7315-7TJ10-0AB0</b> CPU315T-3 PN/DP, 384KB	<b>6ES7317-7TK10-0AB0</b> CPU317T-3 PN/DP, 1024KB	<b>6ES7317-7UL10-0AB0</b> CPU317TF-3 PN/DP, 1,5 MB
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	256	512	512
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	256	512	512
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Size, max.	2 048 byte	4 096 byte	4 096 byte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	2 048 byte	8 192 byte	8 192 byte
• Outputs	2 048 byte	8 192 byte	8 192 byte
<b>Process image</b>			
• Inputs, adjustable	2 048 byte	8 192 byte	8 192 byte
• Outputs, adjustable	2 048 byte	8 192 byte	8 192 byte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	1	4	4
<b>Digital outputs</b>			
<b>Integrated high-speed cams</b>			
• Switching accuracy (+/-)	70 µs	70 µs	70 µs
<b>1. Interface</b>			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
<b>Interface types</b>			
• RS 485	Yes	Yes	Yes
<b>Protocols</b>			
• MPI	Yes	Yes	Yes
• PROFIBUS DP master	Yes	Yes	Yes
• PROFIBUS DP slave	Yes	Yes	Yes
• Point-to-point connection	No	No	No
<b>PROFIBUS DP master</b>			
• Number of DP slaves, max.	124	124	124
<b>2. Interface</b>			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
<b>Interface types</b>			
• RS 485	Yes	Yes	Yes
<b>Protocols</b>			
• MPI	No	No	No
• PROFIBUS DP master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master
• PROFIBUS DP slave	No	No	No
<b>PROFIBUS DP master</b>			
• Number of DP slaves, max.	64	64	64
<b>3. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	2	2	2
<b>Protocols</b>			
• MPI	No	No	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality
• PROFIBUS DP master	No	No	No
• PROFIBUS DP slave	No	No	No

### Technical specifications

Article number	6ES7315-7TJ10-0AB0 CPU315T-3 PN/DP, 384KB	6ES7317-7TK10-0AB0 CPU317T-3 PN/DP, 1024KB	6ES7317-7UL10-0AB0 CPU317TF-3 PN/DP, 1,5 MB
<b>PROFINET IO Controller</b>			
<b>Services</b>			
- Number of connectable IO Devices, max.	128	128	128
- Of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max.	128	128	128
<b>Protocols</b>			
<b>Open IE communication</b>			
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
• UDP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5 compatible communication</b>			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Number of connections</b>			
• overall	16	32	32
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/ password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	120 mm	120 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
<b>Weights</b>			
Weight, approx.	640 g	640 g	640 g

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Digital modules

**SM 321 digital input modules****Overview**

- Digital inputs
- For connecting standard switches and two-wire proximity switches (BEROs)

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**Ordering data****Article No.****Article No.****SM 321 digital input modules**

Incl. labeling strips, bus connector

16 inputs, 24 V DC

**6ES7321-1BH02-0AA0**

16 inputs, 24 V DC, sourcing input

**6ES7321-1BH50-0AA0**

32 inputs, 24 V DC

**6ES7321-1BL00-0AA0**

64 inputs, 24 V DC, source-sinking input

**6ES7321-1BP00-0AA0****Note:**

6ES7392-4...0-0AA0 connecting cable and 6ES7392-1.N00-0AA0 terminal blocks necessary.

16 inputs, 24 to 48 V DC

**6ES7321-1CH00-0AA0**

16 inputs, 48 to 125 V DC

**6ES7321-1CH20-0AA0**

16 inputs, 24 V DC, for isochronous mode

**6ES7321-1BH10-0AA0**

32 inputs, 120 V AC

**6ES7321-1EL00-0AA0**

8 inputs, 120/230 V AC

**6ES7321-1FF01-0AA0**

8 inputs, 120/230 V AC, single root

**6ES7321-1FF10-0AA0**

16 inputs, 120/230 V AC

**6ES7321-1FH00-0AA0**

16 inputs, 24 V DC, for isochronous mode, diagnostics-capable

**6ES7321-7BH01-0AB0****Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0****6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0****6ES7392-1BJ00-1AB0**

40-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AM00-0AA0****6ES7392-1AM00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0****6ES7392-1BM01-1AB0****S7-300 connecting cable**

For 64-channel modules; 2 units

1 m

**6ES7392-4BB00-0AA0**

2.5 m

**6ES7392-4BC50-0AA0**

5 m

**6ES7392-4BF00-0AA0****Terminal block**

For 64-channel modules; 2 units

With screw contacts

**6ES7392-1AN00-0AA0**

With spring-loaded contacts

**6ES7392-1BN00-0AA0****Front door, elevated design****6ES7328-0AA00-7AA0**e.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG conductors; circuit diagram and nameplates in petrol**SIMATIC TOP connect**

See page 5/242

**Bus connectors**

1 unit (spare part)

**6ES7390-0AA00-0AA0****Labeling strips**

10 units (spare part)

for modules with 20-pin front connector

**6ES7392-2XX00-0AA0**

for modules with 40-pin front connector

**6ES7392-2XX10-0AA0****Label cover**

10 units (spare part)

for modules with 20-pin front connector

**6ES7392-2XY00-0AA0**

for modules with 40-pin front connector

**6ES7392-2XY10-0AA0**



Ordering data	Article No.	Article No.
<b>Labeling sheets for machine inscription</b> For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units Petrol Light beige Yellow Red For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units Petrol Light beige Yellow Red	<b>6ES7392-2AX00-0AA0</b> <b>6ES7392-2BX00-0AA0</b> <b>6ES7392-2CX00-0AA0</b> <b>6ES7392-2DX00-0AA0</b>  <b>6ES7392-2AX10-0AA0</b> <b>6ES7392-2BX10-0AA0</b> <b>6ES7392-2CX10-0AA0</b> <b>6ES7392-2DX10-0AA0</b>	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC  <b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates  <b>6ES7998-8XC01-8YE0</b>  <b>6ES7998-8XC01-8YE2</b>

Technical specifications	6ES7321-1BH02-0AA0	6ES7321-1BH50-0AA0	6ES7321-1BL00-0AA0	6ES7321-1BP00-0AA0	6ES7321-1BH10-0AA0
Article number	SM321, 16DI, DC24V	SM321, 16DI, DC24V, Source Input	SM321, 32DI, DC24V	SM321, 64 DI, DC 24V, 3MS, P/M reading	SM321, 16DI, DC24V, 0.05ms Input Delay.
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
<b>Input current</b>					
from backplane bus 5 V DC, max.	10 mA	10 mA	15 mA	100 mA	110 mA
<b>Power loss</b>					
Power loss, typ.	3.5 W	3.5 W	6.5 W	7 W	3.8 W
<b>Digital inputs</b>					
Number of digital inputs	16	16	32	64	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes
<b>Input voltage</b>					
• Type of input voltage	DC	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	-5 to +30V	-30 to +5 V	-30 to +5 V	-30 to +5 V
• for signal "1"	13 to 30V	-13 to -30V	13 to 30V	13 to 30V	13 to 30V
<b>Input current</b>					
• for signal "1", typ.	7 mA	7 mA	7 mA	4.2 mA	7 mA
<b>Input delay (for rated value of input voltage)</b>					
<b>for standard inputs</b>					
- parameterizable	No	No	No	No	No
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms	1.2 ms	25 µs
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms	4.8 ms	75 µs
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m

# SIMATIC S7-300 Advanced Controllers

I/O modules

Digital modules

## SM 321 digital input modules

### Technical specifications

Article number	6ES7321-1BH02-0AA0	6ES7321-1BH50-0AA0	6ES7321-1BL00-0AA0	6ES7321-1BP00-0AA0	6ES7321-1BH10-0AA0
	SM321, 16DI, DC24V	SM321, 16DI, DC24V, Source Input	SM321, 32DI, DC24V	SM321, 64 DI, DC 24V, 3MS, P/M reading	SM321, 16DI, DC24V, 0.05ms Input Delay.
<b>Encoder</b>					
<b>Connectable encoders</b>					
• 2-wire sensor	Yes	Yes	Yes	No	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA		1.5 mA
<b>Interrupts/diagnostics/status information</b>					
Alarms	No	No	No	No	No
Diagnostics function	No	No	No	No	No
<b>Alarms</b>					
• Diagnostic alarm	No	No	No	No	No
• Hardware interrupt	No	No	No	No	No
<b>Connection method</b>					
required front connector	20-pin	20-pin	40-pin	Cable: 6ES7392-4Bxx0-0AA0 terminal blocks: 6ES7392-1xN00-0AA0	20-pin
<b>Dimensions</b>					
Width	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	112 mm	120 mm
<b>Weights</b>					
Weight, approx.	200 g	200 g	260 g	230 g	200 g
Article number	6ES7321-7BH01-0AB0	6ES7321-1CH00-0AA0	6ES7321-1CH20-0AA0	6ES7321-1FH00-0AA0	
	SM321, 16DI, 24V DC	SM321, 16 DI, AC/DC 24-48V, 1ch/common	SM321, 16DI, DC48-125V	SM321, 16 DI, 120/230V AC	
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)	24 V	24 V	48 V		
<b>Load voltage L1</b>					
• Rated value (AC)		24 V		230 V; 120/230 V AC; all load voltages must have the same phase.	
<b>Input current</b>					
from load voltage L+ (without load), max.	90 mA				
from backplane bus 5 V DC, max.	130 mA	100 mA	40 mA	29 mA	
<b>Encoder supply</b>					
Number of outputs	2				
<b>Output current</b>					
• Rated value	120 mA				
<b>Power loss</b>					
Power loss, typ.	4 W	1.5 W; at 24 V; 2.8 W at 48 V	4.3 W	4.9 W	
<b>Digital inputs</b>					
Number of digital inputs	16	16	16	16	
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	Yes	
Input characteristic curve in accordance with IEC 61131, type 2	Yes				
<b>Input voltage</b>					
• Type of input voltage	DC	AC/DC	DC	AC	
• Rated value (DC)	24 V	24 V; DC 24 or 48 V	48 V; 48 V DC to 125 V DC	230 V; 120/230 V AC (47 ... 63 Hz)	
• Rated value (AC)		24 V; 24 V AC or 48 V AC (0 ... 63 Hz)		0 to 40V	
• for signal *0*	-30 to +5 V	-5V AC to +5V AC	-146 V DC to +15 V DC	79 to 264V	
• for signal *1*	13 to 30V	14V AC to 60V AC	30 V DC to 146 V DC		
<b>Input current</b>					
• for signal *1*, typ.	7 mA	2.7 mA	3.5 mA	6.5 mA; (120 V, 60 Hz), 16 mA (230 V, 50 Hz)	

## Technical specifications

Article number	6ES7321-7BH01-0AB0 SM321, 16DI, 24V DC	6ES7321-1CH00-0AA0 SM321, 16 DI, AC/DC 24-48V, 1ch/common	6ES7321-1CH20-0AA0 SM321, 16DI, DC48-125V	6ES7321-1FH00-0AA0 SM321, 16 DI, 120/230V AC
<b>Input delay (for rated value of input voltage) for standard inputs</b>				
- parameterizable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms	No	No	No
- at "0" to "1", min.		16 ms	0.1 ms	25 ms
- at "0" to "1", max.		16 ms	3.5 ms	25 ms
<b>Cable length</b>				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
<b>Encoder</b>				
<b>Connectable encoders</b>				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1 mA	1 mA	2 mA
<b>Interrupts/diagnostics/ status information</b>				
Alarms	Yes	No	No	No
Diagnostics function	Yes; Parameterizable	No	No	No
<b>Alarms</b>				
• Diagnostic alarm	Yes; Parameterizable	No	No	No
• Hardware interrupt	Yes; Parameterizable	No	No	No
<b>Connection method</b>				
required front connector	20-pin	40-pin	20-pin	20-pin
<b>Dimensions</b>				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm
<b>Weights</b>				
Weight, approx.	200 g	260 g	200 g	240 g
Article number	6ES7321-1EL00-0AA0 SM321, 32DI, AC120V	6ES7321-1FF01-0AA0 SM321, 8DI, AC120/230V	6ES7321-1FF10-0AA0 SM321, 8 DI, AC/DC 120/230V, 1ch/common	
<b>Load voltage L1</b>				
• Rated value (AC)	120 V	230 V; 120/230 V AC	230 V; 120/230 V AC; all load voltages must have the same phase.	
<b>Input current</b>				
from backplane bus 5 V DC, max.	16 mA	29 mA	100 mA	
<b>Power loss</b>				
Power loss, typ.	4 W	4.9 W	4.9 W	
<b>Digital inputs</b>				
Number of digital inputs	32	8	8	
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	
Input characteristic curve in accordance with IEC 61131, type 2	Yes			
<b>Input voltage</b>				
• Type of input voltage	AC	AC	AC	
• Rated value (AC)	120 V; 47 ... 63 Hz	230 V; 120/230 V AC (47 ... 63 Hz)	120 V; 120/230 V AC (47 ... 63 Hz)	
• for signal "0"	0 to 20V	0 to 40V	0 to 40V	
• for signal "1"	74 to 132V	79 to 264V	79 to 264V	
<b>Input current</b>				
• for signal "1", typ.	21 mA	6.5 mA; (120 V); 11 mA (230 V)	7.5 mA; (120 V); 17.3 mA (230 V)	
<b>Input delay (for rated value of input voltage) for standard inputs</b>				
- parameterizable	No	No	No	
- at "0" to "1", max.	15 ms	25 ms	25 ms	
<b>Cable length</b>				
• shielded, max.	1 000 m	1 000 m	1 000 m	

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Digital modules

**SM 321 digital input modules****Technical specifications**

Article number	<b>6ES7321-1EL00-0AA0</b> SM321, 32DI, AC120V	<b>6ES7321-1FF01-0AA0</b> SM321, 8DI, AC 120/230V	<b>6ES7321-1FF10-0AA0</b> SM321, 8 DI, AC/DC 120/230V, 1ch/common
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	4 mA	2 mA	2 mA
<b>Interrupts/diagnostics/ status information</b>			
Alarms	No	No	No
Diagnostics function	No	No	No
<b>Alarms</b>			
• Diagnostic alarm	No	No	No
• Hardware interrupt	No	No	No
<b>Connection method</b>			
required front connector	40-pin	20-pin	40-pin
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	300 g	240 g	240 g

## Overview



- Digital outputs
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

## Ordering data

**SM 322 digital output modules**

incl. labeling strips, bus connector

8 outputs, 24 V DC, 2 A

**6ES7322-1BF01-0AA0**

16 outputs, 24 V DC, 0.5 A

**6ES7322-1BH01-0AA0**16 outputs, 24 V DC, 0.5 A,  
high speed**6ES7322-1BH10-0AA0**

32 outputs, 24 V DC, 0.5 A

**6ES7322-1BL00-0AA0**

64 outputs, 24 V DC, 0.3 A

**6ES7322-1BP00-0AA0****Note:**6ES7392-4...0-0AA0 connection  
cable and 6ES7392-1.N00-0AA0  
terminal blocks necessary.64 outputs, 24 V DC, 0.3 A,  
sinking output**6ES7322-1BP50-0AA0****Note:**6ES7392-4...0-0AA0 connection  
cable and 6ES7392-1.N00-0AA0  
terminal blocks necessary.8 outputs, 24 V DC, 0.5 A,  
diagnostics-capable**6ES7322-8BF00-0AB0**

16 outputs, 24/48 V DC, 0.5 A

**6ES7322-5GH00-0AB0**

8 outputs, 48 to 125 V DC, 1.5 A

**6ES7322-1CF00-0AA0**

8 outputs, 120/230 V AC, 1 A

**6ES7322-1FF01-0AA0**

8 outputs, 120/230 V AC, 2 A

**6ES7322-5FF00-0AB0**

16 outputs, 120/230 V AC, 1 A

**6ES7322-1FH00-0AA0**

32 outputs, 120 V AC, 1 A

**6ES7322-1FL00-0AA0**

8 outputs, relay contacts, 2 A

**6ES7322-1HF01-0AA0**

8 outputs, relay contacts, 5 A

**6ES7322-1HF10-0AA0**8 outputs, relay contacts, 5 A,  
with RC filter, overvoltage protection**6ES7322-5HF00-0AB0**

16 outputs, relay contacts, 8 A

**6ES7322-1HH01-0AA0****Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

40-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AM00-0AA0**  
**6ES7392-1AM00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**  
**6ES7392-1BM01-1AB0****S7-300 connecting cable**

For 64-channel modules; 2 units

1 m

**6ES7392-4BB00-0AA0**

2.5 m

**6ES7392-4BC50-0AA0**

5 m

**6ES7392-4BF00-0AA0****Terminal block**

For 64-channel modules; 2 units

With screw contacts

**6ES7392-1AN00-0AA0**

With spring-loaded contacts

**6ES7392-1BN00-0AA0****Front door, elevated design****6ES7328-0AA00-7AA0**e.g. for 32-channel modules;  
for connecting 1.3 mm<sup>2</sup>/16 AWG  
conductors**SIMATIC TOP connect**

See page 5/242

**Bus connectors****6ES7390-0AA00-0AA0**

1 unit (spare part)

**Set of fuses for SM 322**10 fuses 8 A quick-response,  
2 fuse holders;  
for 6ES7322-1FF01-0AA0,  
6ES7322-1FH00-0AA0**6ES7973-1HD00-0AA0**10 fuses 6.3 A;  
for 6ES7322-1CF00-0AA0**6ES7973-1GC00-0AA0**

# SIMATIC S7-300 Advanced Controllers

I/O modules

Digital modules

## SM 322 digital output modules

### Ordering data

#### Labeling strips

10 units (spare part)  
for modules with  
20-pin front connector  
for modules with  
40-pin front connector

6ES7392-2XX00-0AA0

6ES7392-2XX10-0AA0

#### Label cover

10 units (spare part)  
for modules with  
20-pin front connector  
for modules with  
40-pin front connector

6ES7392-2XY00-0AA0

6ES7392-2XY10-0AA0

#### Labeling sheets for machine inscription

for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

6ES7392-2AX00-0AA0

light-beige

6ES7392-2BX00-0AA0

yellow

6ES7392-2CX00-0AA0

red

6ES7392-2DX00-0AA0

for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

6ES7392-2AX10-0AA0

light-beige

6ES7392-2BX10-0AA0

yellow

6ES7392-2CX10-0AA0

red

6ES7392-2DX10-0AA0

#### SIMATIC Manual Collection

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

### Article No.

6ES7998-8XC01-8YE0

#### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7998-8XC01-8YE2

### Technical specifications

Article number	6ES7322-1BH01-0AA0	6ES7322-1BH10-0AA0	6ES7322-1BL00-0AA0	6ES7322-1BP00-0AA0	6ES7322-1BP50-0AA0	6ES7322-8BF00-0AB0
	SM322, 16DO 24V DC, 0.5A	SM322 High Speed, 16DO 24V DC, 0.5A	SM322, 32DO 24V DC, 0.5A	SM322 64DA, DC24V, 0.3A P-write	SM322 64DO, DC24V, 0.3A M-write	SM322, 8DO, 24V DC, 0.5A
<b>Supply voltage</b>						
<b>Load voltage L+</b>						
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
<b>Input current</b>						
from load voltage L+ (without load), max.	80 mA	110 mA	160 mA	75 mA	75 mA	90 mA
from backplane bus 5 V DC, max.	80 mA	70 mA	110 mA	100 mA	100 mA	70 mA
<b>Power loss</b>						
Power loss, typ.	4.9 W	5 W	6.6 W	6 W	6 W	5 W
<b>Digital outputs</b>						
Number of digital outputs	16	16	32	64	64	8
Short-circuit protection	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	M+ (45 V)	L+ (-45 V)
<b>Switching capacity of the outputs</b>						
• on lamp load, max.	5 W	5 W	5 W	5 W	5 W	5 W
<b>Load resistance range</b>						
• lower limit	48 Ω	48 Ω	48 Ω	80 Ω	80 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ	10 kΩ	10 kΩ	3 kΩ
<b>Output voltage</b>						
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.5 V)	M+ (0.5 V)	L+ (-0.8 to -1.6 V)
<b>Output current</b>						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.3 A	0.3 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.1 mA		0.5 mA

## Technical specifications

Article number	6ES7322-1BH01-0AA0	6ES7322-1BH10-0AA0	6ES7322-1BL00-0AA0	6ES7322-1BP00-0AA0	6ES7322-1BP50-0AA0	6ES7322-8BF00-0AB0
	SM322, 16DO 24V DC, 0,5A	SM322 High Speed, 16DO 24V DC, 0,5A	SM322, 32DO 24V DC, 0,5A	SM322 64DA, DC24V, 0,3A P-write	SM322 64DO, DC24V, 0,3A M-write	SM322, 8DO, 24V DC, 0,5A
<b>Switching frequency</b>						
• with resistive load, max.	100 Hz	1 000 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
<b>Total current of the outputs (per group)</b>						
<b>horizontal installation</b>						
- up to 40 °C, max.	4 A	4 A	4 A	1.6 A	1.6 A	4 A
- up to 60 °C, max.	3 A	3 A	3 A	1.2 A	1.2 A	3 A
<b>vertical installation</b>						
- up to 40 °C, max.	2 A	2 A	2 A	1.6 A	1.6 A	4 A
<b>Cable length</b>						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
<b>Interrupts/diagnostics/status information</b>						
Alarms	No	No	No	No	No	
Diagnostics function	No	No	No	No	No	Yes; Parameterizable
<b>Alarms</b>						
• Diagnostic alarm	No	No	No	No	No	Yes; Parameterizable
<b>Connection method</b>						
required front connector	20-pin	20-pin	40-pin	Cable: 6ES7392-4Bxx0-0AA0 terminal blocks: 6ES7392-1xN00-0AA0	Cable: 6ES7392-4Bxx0-0AA0 terminal blocks: 6ES7392-1xN00-0AA0	20-pin
<b>Dimensions</b>						
Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	112 mm	112 mm	120 mm
<b>Weights</b>						
Weight, approx.	190 g	200 g	260 g	230 g	230 g	210 g
Article number	6ES7322-5GH00-0AB0	6ES7322-1CF00-0AA0	6ES7322-1BF01-0AA0	6ES7322-1FF01-0AA0	6ES7322-5FF00-0AB0	6ES7322-1FH00-0AA0
	SM322, 16DO, AC/DC24-48V, 0,5A	SM322, 8DO, 48-125V DC, 1,5A	SM322, 8DO, 24V DC, 2A	SM322, 8DO, 120/230V AC, 1A	SM322, 8DO, AC120/230V, 2A	SM322, 16DO, 120/230V AC, 1A
<b>Supply voltage</b>						
<b>Load voltage L+</b>						
• Rated value (DC)	24 V	48 V; 48 V DC to 125 V DC	24 V			
<b>Load voltage L1</b>						
• Rated value (AC)				230 V; 120/230 V AC	230 V; 120/230 V AC	230 V; 120/230 V AC
<b>Input current</b>						
from supply voltage L+, max.	200 mA					
from load voltage L+ (without load), max.		2 mA	60 mA			
from load voltage L1 (without load), max.				2 mA	2 mA	2 mA
from backplane bus 5 V DC, max.	100 mA	100 mA	40 mA	100 mA	100 mA	200 mA
<b>Power loss</b>						
Power loss, typ.	2.8 W	7.2 W	6.8 W	8.6 W	8.6 W	8.6 W
<b>Digital outputs</b>						
Number of digital outputs	16	8	8	8	8	16
Short-circuit protection	No; to be provided externally	Yes; Electronic	Yes; Electronic	Yes; Fuse 8 A, 250 V; per group	Yes; to be provided externally; fuse 3.15 A / 250 V, quick response	Yes; Fuse 8 A, 250 V; per group
Limitation of inductive shutdown voltage to		M (-1 V)	L+ (-48 V)			

## SIMATIC S7-300 Advanced Controllers

I/O modules

Digital modules

## SM 322 digital output modules

## Technical specifications

Article number	6ES7322-5GH00-0A00 SM322, 16DO, AC/DC24-48V, 0,5A	6ES7322-1CF00-0AA0 SM322, 8DO, 48-125V DC, 1,5A	6ES7322-1BF01-0AA0 SM322, 8DO, 24V DC, 2A	6ES7322-1FF01-0AA0 SM322, 8DO, 120/230V AC, 1A	6ES7322-5FF00-0A00 SM322, 8DO, AC120/230V, 2A	6ES7322-1FH00-0AA0 SM322, 16DO, 120/230V AC, 1A
<b>Switching capacity of the outputs</b> • on lamp load, max.	2.5 W	15 W; 15 W (48 V) or 40 W (125 V)	10 W	50 W	50 W	50 W
<b>Load resistance range</b> • lower limit • upper limit			12 Ω 4 kΩ			
<b>Output voltage</b> • for signal "1", min.	L+ (-0.25 V)	L+ (-1.2 V)	L+ (-0.8 V)	L1 (-1.5 V)	L1 (-8.5 V)	
<b>Output current</b> • for signal "1" rated value • for signal "0" residual current, max.	0.5 A 10 μA	1.5 A 0.5 mA	2 A 0.5 mA	2 A 2 mA	2 A 2 mA	1 A 2 mA
<b>Switching frequency</b> • with resistive load, max. • with inductive load, max. • on lamp load, max.	10 Hz 0.5 Hz 0.5 Hz	25 Hz 0.5 Hz 10 Hz	100 Hz 0.5 Hz 10 Hz	10 Hz 0.5 Hz 1 Hz	10 Hz 0.5 Hz 1 Hz	10 Hz 0.5 Hz 1 Hz
<b>Total current of the outputs (per group)</b> <b>horizontal installation</b> - up to 40 °C, max. - up to 50 °C, max. - up to 60 °C, max. <b>vertical installation</b> - up to 40 °C, max.	0.5 A; 8 A per module  0.5 A; 8 A per module 0.5 A; 8 A per module	6 A 4 A 3 A	4 A 4 A 4 A	4 A 2 A 2 A	8 A 4 A 4 A	4 A 2 A 2 A
<b>Cable length</b> • shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
<b>Interrupts/diagnostics/status information</b> Alarms Diagnostics function	Yes; Parameterizable	No No	No No	No Yes; Fuse blown or load voltage missing	Yes; Parameterizable	Yes; Fuse blown or load voltage missing
<b>Alarms</b> • Diagnostic alarm	Yes; Parameterizable	No	No	No	Yes; Parameterizable	No
<b>Connection method</b> required front connector	40-pin	20-pin	20-pin	20-pin	40-pin	20-pin
<b>Dimensions</b> Width Height Depth	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm
<b>Weights</b> Weight, approx.	260 g	250 g	190 g	275 g	275 g	275 g
Article number	6ES7322-1FL00-0AA0 SM322, 32DO, 120/230V AC, 1A	6ES7322-1HF01-0AA0 SM322, 8DA, 24V DC/2A or 230V AC/2A	6ES7322-1HF10-0AA0 SM322, 8DA, 24V DC/5A OR 230V AC/5A	6ES7322-5HF00-0A00 SM322, 8DO Relay, 24VDC, 120-230V AC, 5A	6ES7322-1HH01-0AA0 SM322, 16DO Relay	
<b>Supply voltage</b> <b>Load voltage L+</b> • Rated value (DC)		24 V	120 V	24 V	120 V	
<b>Load voltage L1</b> • Rated value (AC)	120 V; 120/230 V AC		230 V	230 V	230 V	
<b>Input current</b> from supply voltage L+, max. from load voltage L1 (without load), max. from backplane bus 5 V DC, max.	10 mA	160 mA 40 mA	125 mA 40 mA	160 mA 100 mA	250 mA 100 mA	



## Technical specifications

Article number	6ES7322-1FL00-0AA0	6ES7322-1HF01-0AA0	6ES7322-1HF10-0AA0	6ES7322-5HF00-0AB0	6ES7322-1HH01-0AA0
	SM322, 32DO, 120/230V AC, 1A	SM322, 8DA, 24V DC/2A or 230V AC/2A	SM322, 8DA, 24V DC/5A OR 230V AC/5A	SM322, 8DO Relay, 24VDC, 120-230V AC, 5A	SM322, 16DO Relay
<b>Power loss</b>					
Power loss, typ.	25 W	3.2 W	3.2 W	3.5 W	4.5 W
<b>Digital outputs</b>					
Number of digital outputs	32	8; Relays	8; Relays	8; Relays	16; Relays
Short-circuit protection	No	No	No; to be provided externally	No; to be provided externally	No
<b>Switching capacity of the outputs</b>					
• on lamp load, max.	50 W	50 W	1 500 W; 230 V AC	1 500 W; 230 V AC	50 W; 230 V AC
<b>Output voltage</b>					
• for signal "1", min.	L1 (-0.8 V)				
<b>Output current</b>					
• for signal "1" rated value	1 A	2 A	5 A	5 A	2 A
• for signal "0" residual current, max.	2 mA				
<b>Switching frequency</b>					
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz	10 Hz
<b>Total current of the outputs (per group)</b>					
<b>horizontal installation</b>					
- up to 40 °C, max.	4 A				
- up to 60 °C, max.	3 A		5 A	5 A	8 A
<b>vertical installation</b>					
- up to 40 °C, max.	4 A		5 A	5 A	8 A
<b>Relay outputs</b>					
• Rated supply voltage of relay coil L+ (DC)		24 V; 110 mA	24 V		24 V
• Contact connection (internal)		Yes; SIOV-CU4032 K275G	No	Yes; 330 Ohm, 0.1uF	No
• Number of operating cycles, max.		300 000; 230 V AC; 100 000; 120 V AC; 200 000; 24 V DC; 300 000 (at 2 A)	300 000; 300 000 (24 V DC, at 2 A); 200 000 (120 V AC, at 3 A); 100 000 (230 V AC, at 3 A)	100 000; 100 000 (24 V DC, at 5 A), 100 000 (230 V AC, at 5 A)	100 000; 50 000 (24 V DC, at 2 A); 700 000 (120 V AC, at 2 A); 100 000 (230 V AC, at 2 A)
<b>Switching capacity of contacts</b>					
- with inductive load, max.		2 A; 2 A (230 V AC), 2 A (24 V DC)	3 A; 3 A (230 V DC), 2 A (24 V AC)	5 A; 5 A (230 V DC), 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
- with resistive load, max.		2 A	8 A; 8 A (230 V DC), 5 A (24 V AC)	5 A; 5 A (230 V DC), 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
- Thermal continuous current, max.		3 A	8 A	5 A	2 A
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
<b>Interrupts/diagnostics/ status information</b>					
Alarms	No	No	No	Yes	No
Diagnostics function	Yes; Fuse blown or load voltage missing	No	No	Yes; Parameterizable	No
<b>Alarms</b>					
• Diagnostic alarm	No	No	No	Yes; Parameterizable	No
<b>Connection method</b>					
required front connector	20-pin	20-pin	40-pin	40-pin	20-pin
<b>Dimensions</b>					
Width	80 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	117 mm	120 mm	120 mm	120 mm	120 mm
<b>Weights</b>					
Weight, approx.	500 g	190 g	320 g	320 g	250 g

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Digital modules

**SM 323/SM 327 digital input/output modules****Overview**

- Digital inputs and outputs
- For connection of switches, 2-wire proximity switches (BEROs), solenoid valves, contactors, low-power motors, lamps and motor starters

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**Ordering data****Article No.****SM 323 digital input/output modules**

incl. labeling strips, bus connector

8 inputs, 8 outputs

**6ES7323-1BH01-0AA0**

16 inputs, 16 outputs

**6ES7323-1BL00-0AA0****SM 327 digital input/output modules**

incl. labeling strips, bus connector

8 inputs, 8 inputs or outputs  
(can be configured)**6ES7327-1BH00-0AB0****Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

40-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AM00-0AA0**  
**6ES7392-1AM00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**  
**6ES7392-1BM01-1AB0****Front door, elevated design****6ES7328-0AA00-7AA0**e.g. for 32 channel modules;  
enables connection of  
1.3 mm<sup>2</sup>/16 AWG wires**SIMATIC TOP connect**

See page 5/242

**Bus connectors****6ES7390-0AA00-0AA0**

1 unit (spare part)

**Labeling strips**

10 units (spare part)

for modules with

**6ES7392-2XX00-0AA0**

20-pin front connector

for modules with

**6ES7392-2XX10-0AA0**

40-pin front connector

**Article No.****Label cover**

10 units (spare part)

for modules with  
20-pin front connector**6ES7392-2XY00-0AA0**for modules with  
40-pin front connector**6ES7392-2XY10-0AA0****Labeling sheets  
for machine inscription**for modules with 20-pin front  
connector, DIN A4, for printing  
with laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light-beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0**for modules with 40-pin front  
connector, DIN A4, for printing  
with laser printer; 10 units

petrol

**6ES7392-2AX10-0AA0**

light-beige

**6ES7392-2BX10-0AA0**

yellow

**6ES7392-2CX10-0AA0**

red

**6ES7392-2DX10-0AA0****SIMATIC Manual Collection****6ES7998-8XC01-8YE0**Electronic manuals on DVD,  
multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC**SIMATIC Manual Collection  
update service for 1 year****6ES7998-8XC01-8YE2**Current "Manual Collection" DVD  
and the three subsequent updates

## Technical specifications

Article number	6ES7323-1BH01-0AA0 SM323, 8DI/8DO, DC24V, 0,5A	6ES7323-1BL00-0AA0 SM323, 16DI/DO, DC24V, 0,5A	6ES7327-1BH00-0AB0 SM327, 8DI/8DX, DC24V, 0,5A
<b>Supply voltage</b>			
<b>Load voltage L+</b>			
• Rated value (DC)	24 V	24 V	24 V
<b>Input current</b>			
from load voltage L+ (without load), max.	40 mA	80 mA	20 mA
from backplane bus 5 V DC, max.	40 mA	80 mA	60 mA
<b>Power loss</b>			
Power loss, typ.	3.5 W	6.5 W	3 W
<b>Digital inputs</b>			
Number of digital inputs	8	16	8; 8 hard-wired, 8 others individually parameterizable
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes
<b>Input voltage</b>			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V
• for signal "1"	13 to 30V	13 to 30V	+15 to +30 V
<b>Input current</b>			
• for signal "1", typ.	7 mA	7 mA	6 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms
<b>Cable length</b>			
• shielded, max.	1 000 m	1 000 m	1 000 m
<b>Digital outputs</b>			
Number of digital outputs	8	16	8; can also be parameterized individually as DI
Short-circuit protection	Yes	Yes	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-48 V)	L+ (-54 V)
<b>Switching capacity of the outputs</b>			
• on lamp load, max.	5 W	5 W	5 W
<b>Load resistance range</b>			
• lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
<b>Output voltage</b>			
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.5 V)
<b>Output current</b>			
• for signal "1" rated value	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	100 Hz	10 Hz
<b>Total current of the outputs (per group)</b>			
<b>horizontal installation</b>			
- up to 40 °C, max.	4 A	4 A	4 A
- up to 60 °C, max.	4 A	3 A	3 A
<b>vertical installation</b>			
- up to 40 °C, max.	4 A	2 A	2 A
<b>Cable length</b>			
• shielded, max.	1 000 m	1 000 m	1 000 m

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Digital modules

**SM 323/SM 327 digital input/output modules****Technical specifications**

Article number	<b>6ES7323-1BH01-0AA0</b>	<b>6ES7323-1BL00-0AA0</b>	<b>6ES7327-1BH00-0AB0</b>
	SM323, 8DI/8DO, DC24V, 0,5A	SM323, 16DI/DO, DC24V, 0,5A	SM327, 8DI/8DX, DC24V, 0,5A
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1.5 mA	1.5 mA
<b>Interrupts/diagnostics/status information</b>			
Alarms	No	No	No
Diagnostics function	No	No	No
<b>Connection method</b>			
required front connector	20-pin	40-pin	20-pin
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	220 g	260 g	200 g

**Overview**

- Digital inputs
- For connection of switches and 2-wire proximity switches (BEROs)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****Article No.****SIPLUS S7-300 SM 321 digital input modules**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

16 inputs, 24 V DC

**6AG1321-1BH02-2AA0**

32 inputs, 24 V DC

**6AG1321-1BL00-2AA0**

16 inputs, 48 to 120 V DC

**6AG1321-1CH20-2AA0**

8 inputs, 120/230 V AC

**6AG1321-1FF01-2AA0**

8 inputs, 120/230 V AC, single root

**6AG1321-1FF10-7AA0**

16 inputs, 120/230 V AC

**6AG1321-1FH00-7AA0**

16 inputs, 24 V DC, diagnostics-capable

**6AG1321-7BH01-2AB0**

Exposure to media

16 inputs, NAMUR, redundant design possible

**6AG1321-7TH00-4AB0**

*For rolling stock railway applications*

Conforms to EN 50155

16 inputs, 24 V DC

**6AG1321-1BH02-2AA0**

32 inputs, 24 V DC

**6AG1321-1BL00-2AA0**

16 inputs, 48 to 120 V DC

**6AG1321-1CH20-2AA0**

8 inputs, 120/230 V AC

**6AG1321-1FF01-2AA0**

16 inputs, 24 V DC, diagnostics-capable

**6AG1321-7BH01-2AB0**

**Accessories**Mandatory**Front connector**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**

**6ES7392-1BJ00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**

**6ES7392-1BM01-1AB0**

Consumables**Front door, elevated design**

**6ES7328-0AA00-7AA0**

E.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG conductors; circuit diagram and nameplates in petrol

**Bus connectors**

**6ES7390-0AA00-0AA0**

1 unit (spare part)

**Labeling strips**

10 units; spare part

For modules with 20-pin front connector

**6ES7392-2XX00-0AA0**

For modules with 40-pin front connector

**6ES7392-2XX10-0AA0**

**Label cover**

10 units; spare part

For modules with 20-pin front connector

**6ES7392-2XY00-0AA0**

For modules with 40-pin front connector

**6ES7392-2XY10-0AA0**

Documentation**SIMATIC Manual Collection**

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection update service for 1 year**

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2**

## SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 digital modules

## SIPLUS S7-300 SM 321

## Technical specifications

Article number	6AG1321-1BH02-2AA0	6AG1321-1BL00-2AA0	6AG1321-1CH20-2AA0	6AG1321-1FF01-2AA0	6AG1321-1FF10-7AA0
Based on	6ES7321-1BH02-0AA0 SIPLUS SM321 16DE/24VDC	6ES7321-1BL00-0AA0 SIPLUS SM321 32DE/24VDC	6ES7321-1CH20-0AA0 SIPLUS SM 321 16DE/ DC 48-125 V	6ES7321-1FF01-0AA0 SIPLUS S7-300 SM321 8DE/120/230VAC	6ES7321-1FF10-0AA0 SIPLUS S7-300 SM321 8 DI
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• min.	-40 °C; = Tmin	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin	-25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m	2 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>					
<b>Use in stationary industrial systems</b>					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>					
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *

#### Technical specifications

Article number	6AG1321-1BH02-2AA0	6AG1321-1BL00-2AA0	6AG1321-1CH20-2AA0	6AG1321-1FF01-2AA0	6AG1321-1FF10-7AA0
Based on	6ES7321-1BH02-0AA0 SIPLUS SM321 16DE/24VDC	6ES7321-1BL00-0AA0 SIPLUS SM321 32DE/24VDC	6ES7321-1CH20-0AA0 SIPLUS SM 321 16DE/ DC 48-125 V	6ES7321-1FF01-0AA0 SIPLUS S7-300 SM321 8DE/120/230VAC	6ES7321-1FF10-0AA0 SIPLUS S7-300 SM321 8 DI
<b>Use on ships/at sea</b>					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Article number	6AG1321-1FH00-7AA0		6AG1321-7BH01-2AB0		6AG1321-7TH00-4AB0
Based on	6ES7321-1FH00-0AA0 SIPLUS S7-300 SM321 16DI		6ES7321-7BH01-0AB0 SIPLUS SM321 16DE/24VDC		6ES7321-7TH00-0AB0 SIPLUS PCS 7 SM321 16DE
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• min.	-40 °C; = Tmin		-25 °C; = Tmin		0 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use		70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use		60 °C
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m		5 000 m		5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)		Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)		Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

# SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 digital modules

## SIPLUS S7-300 SM 321

### Technical specifications

Article number	6AG1321-1FH00-7AA0	6AG1321-7BH01-2AB0	6AG1321-7TH00-4AB0
Based on	6ES7321-1FH00-0AA0 SIPLUS S7-300 SM321 16DI	6ES7321-7BH01-0AB0 SIPLUS SM321 16DE/24VDC	6ES7321-7TH00-0AB0 SIPLUS PCS 7 SM321 16DE
<b>Resistance</b>			
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>			
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *	
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

5



## Overview



- Digital outputs
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

## Article No.

**SIPLUS S7-300 SM 322 digital output modules**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

- 8 outputs, 24 V DC, 2 A
- 16 outputs, 24 V DC, 0.5 A
- 32 outputs, 24 V DC, 0.5 A
- 8 outputs, 48 to 125 V DC, 1.5 A
- 8 outputs, 120/230 V AC, 1 A
- 16 outputs, 120/230 V AC, 1 A
- 8 outputs, relay contacts, 5 A
- 16 outputs, relay contacts, 8 A
- 8 outputs, 24 V DC, 0.5 A, diagnostics-capable

Exposure to media

- 8 outputs, 120/230 V AC, 2 A
- 8 outputs, relay contacts, 5 A, with RC filter, overvoltage protection

*For rolling stock railway applications*

Conforms to EN 50155

- 16 outputs, 24 V DC, 0.5 A, high speed
- 32 outputs, 24 V DC, 0.5 A
- 8 outputs, relay contacts, 5 A
- 16 outputs, relay contacts, 8 A
- 8 outputs, 24 V DC, 0.5 A, diagnostics-capable

**Accessories**

*Mandatory*

**Front connector**

- 20-pin, with spring-loaded contacts
  - 1 unit
  - 100 units
- 40-pin, with spring-loaded contacts
  - 1 unit
  - 100 units

- 6AG1322-1BF01-2XB0
- 6AG1322-1BH01-2AA0
- 6AG1322-1BL00-2AA0
- 6AG1322-1CF00-7AA0
- 6AG1322-1FF01-7AA0
- 6AG1322-1FH00-7AA0
- 6AG1322-1HF10-2AA0
- 6AG1322-1HH01-2AA0
- 6AG1322-8BF00-2AB0

- 6AG1322-5FF00-4AB0
- 6AG1322-5HF00-4AB0

- 6AG1322-1BH01-2AA0
- 6AG1322-1BL00-2AA0
- 6AG1322-1HF10-2AA0
- 6AG1322-1HH01-2AA0
- 6AG1322-8BF00-2AB0

- 6ES7392-1BJ00-0AA0
- 6ES7392-1BJ00-1AB0

- 6ES7392-1BM01-0AA0
- 6ES7392-1BM01-1AB0

*Consumables***Front door, elevated design**

E.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG conductors; circuit diagram and nameplates in petrol

- 6ES7328-0AA00-7AA0
- 6ES7390-0AA00-0AA0

**Bus connectors**

1 unit (spare part)

**Labeling strips**

10 units; spare part

For modules with 20-pin front connector

For modules with 40-pin front connector

**Label cover**

10 units; spare part

For modules with 20-pin front connector

For modules with 40-pin front connector

*Documentation***SIMATIC Manual Collection**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

- 6ES7328-0AA00-7AA0
- 6ES7390-0AA00-0AA0
- 6ES7392-2XX00-0AA0
- 6ES7392-2XX10-0AA0
- 6ES7392-2XY00-0AA0
- 6ES7392-2XY10-0AA0
- 6ES7998-8XC01-8YE0
- 6ES7998-8XC01-8YE2

- 6ES7998-8XC01-8YE0
- 6ES7998-8XC01-8YE2

- 6ES7998-8XC01-8YE2

Current "Manual Collection" DVD and the three subsequent updates

## SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 digital modules

## SIPLUS S7-300 SM 322

## Technical specifications

Article number	6AG1322-1BF01-2XB0	6AG1322-8BF00-2AB0	6AG1322-1BH01-2AA0	6AG1322-1BL00-2AA0
Based on	6ES7322-1BF01-0XB0 SIPLUS S7-300 SM322	6ES7322-8BF00-0AB0 SIPLUS SM322 8DA/24VDC	6ES7322-1BH01-0AA0 SIPLUS S7-300 SM322 16DA/24VDC 0.5A	6ES7322-1BL00-0AA0 SIPLUS S7-300 SM322 32DO/24VDC 0.5A
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-25 °C	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use	70 °C; = Tmax; 60 °C @ UL/cUL use	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>				
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>				
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

### Technical specifications

Article number	6AG1322-1BF01-2XB0	6AG1322-8BF00-2AB0	6AG1322-1BH01-2AA0	6AG1322-1BL00-2AA0
Based on	6ES7322-1BF01-0XB0 SIPLUS S7-300 SM322	6ES7322-8BF00-0AB0 SIPLUS SM322 8DA/24VDC	6ES7322-1BH01-0AA0 SIPLUS S7-300 SM322 16DA/24VDC 0.5A	6ES7322-1BL00-0AA0 SIPLUS S7-300 SM322 32DO/24VDC 0.5A
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Article number	6AG1322-1CF00-7AA0	6AG1322-1HF10-2AA0	6AG1322-5HF00-4AB0	6AG1322-1FF01-7AA0
Based on	6ES7322-1CF00-0AA0 SIPLUS SM322 8DA/48-125VDC	6ES7322-1HF10-0AA0 SIPLUS SM322 8DA - Relais	6ES7322-5HF00-0AB0 SIPLUS_SM322_8RO	6ES7322-1FF01-0AA0 SIPLUS S7-300 SM322 8DA/120/230VAC
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-25 °C	-25 °C; = Tmin	0 °C; = Tmin	-40 °C
• max.	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	60 °C	60 °C; = Tmax	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/UL hazardous use applies
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Resistance</b>				
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>				
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust, *		

# SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 digital modules

## SIPLUS S7-300 SM 322

### Technical specifications

Article number	6AG1322-1CF00-7AA0	6AG1322-1HF10-2AA0	6AG1322-5HF00-4AB0	6AG1322-1FF01-7AA0
Based on	6ES7322-1CF00-0AA0 SIPLUS SM322 8DA/48-125VDC	6ES7322-1HF10-0AA0 SIPLUS SM322 8DA - Relais	6ES7322-5HF00-0AB0 SIPLUS_SM322_8RO	6ES7322-1FF01-0AA0 SIPLUS S7-300 SM322 8DA/120/230VAC
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Article number	6AG1322-5FF00-4AB0	6AG1322-1FH00-7AA0	6AG1322-1HH01-2AA0	
Based on	6ES7322-5FF00-0AB0 SIPLUS S7-300 SM322 8DO	6ES7322-1FH00-0AA0 SIPLUS S7-300 SM322 16DO	6ES7322-1HH01-0AA0 SIPLUS SM322	
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	0 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	
• max.	60 °C; = Tmax	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	

## Technical specifications

Article number	6AG1322-5FF00-4AB0	6AG1322-1FH00-7AA0	6AG1322-1HH01-2AA0
Based on	6ES7322-5FF00-0AB0	6ES7322-1FH00-0AA0	6ES7322-1HH01-0AA0
	SIPLUS S7-300 SM322 8DO	SIPLUS S7-300 SM322 16DO	SIPLUS SM322
<b>Resistance</b>			
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>			
- to biologically active substances according to EN 60721-3-3			Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5			Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5			Yes; Class 5S3 incl. sand, dust; *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 digital modules

**SIPLUS S7-300 SM 323****Overview**

- Digital inputs and outputs
- For connection of switches, 2-wire proximity switches (BEROs), solenoid valves, contactors, low-power motors, lamps and motor starters

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Ordering data****Article No.****SIPLUS S7-300 SM 323 digital input/output module**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

8 inputs, 8 outputs

**6AG1323-1BH01-2AA0**

*For rolling stock railway applications*

Conforms to EN 50155

8 inputs, 8 outputs

**6AG1323-1BH01-2AA0**

**Accessories**

*Mandatory*

**Front connector**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**  
**6ES7392-1BM01-1AB0**

*Consumables*

**Front door, elevated design**

**6ES7328-0AA00-7AA0**

E.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG conductors; circuit diagram and nameplates in petrol

**Bus connectors**

**6ES7390-0AA00-0AA0**

1 unit (spare part)

**Labeling strips**

10 units; spare part

For modules with 20-pin front connector

**6ES7392-2XX00-0AA0**

For modules with 40-pin front connector

**6ES7392-2XX10-0AA0**

**Label cover**

10 units; spare part

For modules with 20-pin front connector

**6ES7392-2XY00-0AA0**

For modules with 40-pin front connector

**6ES7392-2XY10-0AA0**

**Article No.**

*Documentation*

**SIMATIC Manual Collection**

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection update service for 1 year**

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

## Technical specifications

Article number	<b>6AG1323-1BH01-2AA0</b>
Based on	<b>6ES7323-1BH01-0AA0</b> SIPLUS SM323 8DE/8DA
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>	
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *

Article number	<b>6AG1323-1BH01-2AA0</b>
Based on	<b>6ES7323-1BH01-0AA0</b> SIPLUS SM323 8DE/8DA
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Analog modules

**SM 331 analog input modules****Overview**

- Analog inputs
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers

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**Ordering data****Article No.****Article No.****SM 331 analog input modules**

Including labeling strips,  
bus connector,  
measuring range modules

8 inputs, resolution 13 bits

**6ES7331-1KF02-0AB0**

8 inputs, resolution 9/12/14 bits

**6ES7331-7KF02-0AB0**

2 inputs, resolution 9/12/14 bits

**6ES7331-7KB02-0AB0**8 inputs,  
enhanced resolution 16 bits**6ES7331-7NF00-0AB0**8 inputs, enhanced resolution  
16 bits, 4-channel mode**6ES7331-7NF10-0AB0**8 inputs, resolution 14 bits,  
for isochronous mode**6ES7331-7HF01-0AB0**6 inputs, for thermal elements,  
resolution 16 bits**6ES7331-7PE10-0AB0**

8 inputs, for thermal resistors

**6ES7331-7PF01-0AB0**

8 inputs, for thermoelements

**6ES7331-7PF11-0AB0****Measuring range module  
for analog inputs****6ES7974-0AA00-0AA0**1 module for 2 analog inputs;  
2 units (spare part)**Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0****6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0****6ES7392-1BJ00-1AB0**

40-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AM00-0AA0****6ES7392-1AM00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0****6ES7392-1BM01-1AB0****Front door, elevated design****6ES7328-0AA00-7AA0**e.g. for 32-channel modules; for  
connecting 1.3 mm<sup>2</sup>/16 AWG wires**SIMATIC TOP connect**

See page 5/242

**Bus connectors****6ES7390-0AA00-0AA0**

1 unit (spare part)

**Shield connection element****6ES7390-5AA00-0AA0**80 mm wide, with 2 rows for  
4 shield connection clamps each**Shield connection clamps**

2 units

For 2 cables  
with 2 mm to 6 mm diameter**6ES7390-5AB00-0AA0**For 1 cable  
with 3 mm to 8 mm diameter**6ES7390-5BA00-0AA0**For 1 cable  
with 4 mm to 13 mm diameter**6ES7390-5CA00-0AA0****Label cover****6ES7392-2XY00-0AA0**10 units (spare part), for modules  
with 20-pin front connector**Labeling strips****6ES7392-2XX00-0AA0**10 units (spare part), for modules  
with 20-pin front connector**Labeling sheets  
for machine labeling**For modules with 20-pin front  
connector, DIN A4, for printing  
with laser printer; 10 units

Petrol

**6ES7392-2AX00-0AA0**

Light beige

**6ES7392-2BX00-0AA0**

Yellow

**6ES7392-2CX00-0AA0**

Red

**6ES7392-2DX00-0AA0**For modules with 40-pin front  
connector, DIN A4, for printing  
with laser printer; 10 units

Petrol

**6ES7392-2AX10-0AA0**

Light beige

**6ES7392-2BX10-0AA0**

Yellow

**6ES7392-2CX10-0AA0**

Red

**6ES7392-2DX10-0AA0**



## Ordering data

## Article No.

## Article No.

**SIMATIC Manual Collection**

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection  
update service for 1 year**

Current "Manual Collection" DVD  
and the three subsequent updates

**6ES7998-8XC01-8YE2**

## Technical specifications

Article number	<b>6ES7331-7KF02-0AB0</b> SM331, 8AI, 9/12/14Bit	<b>6ES7331-7HF01-0AB0</b> SM331, 8AI, 14BIT, 0,052MS/channel	<b>6ES7331-1KF02-0AB0</b> SM331, 8AI, 13bit	<b>6ES7331-7KB02-0AB0</b> SM331, 2AI, 9/12/14Bit
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
• Rated value (DC)	24 V	24 V		24 V
<b>Input current</b>				
from load voltage L+ (without load), max.	30 mA	50 mA		30 mA
from backplane bus 5 V DC, max.	50 mA	100 mA	90 mA	50 mA
<b>Power loss</b>				
Power loss, typ.	1 W	1.5 W	0.4 W	1 W
<b>Analog inputs</b>				
Number of analog inputs	8	8	8	2
• For resistance measurement	4		8	1
permissible input voltage for voltage input (destruction limit), max.	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)	20 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	30 V; 12 V continuous, 30 V for max. 1 s	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA
<b>Input ranges (rated values), voltages</b>				
• 0 to +10 V	No	No	Yes	No
• 1 V to 5 V	Yes	Yes	Yes	Yes
• 1 V to 10 V	No		No	No
• -1 V to +1 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes		No	Yes
• -250 mV to +250 mV	Yes		No	Yes
• -5 V to +5 V	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	No		Yes	No
• -500 mV to +500 mV	Yes	Yes	Yes	Yes
• -80 mV to +80 mV	Yes	Yes	No	Yes
<b>Input ranges (rated values), currents</b>				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -10 mA to +10 mA	Yes		No	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• -3.2 mA to +3.2 mA	Yes		No	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes

# SIMATIC S7-300 Advanced Controllers

I/O modules

Analog modules

## SM 331 analog input modules

### Technical specifications

Article number	6ES7331-7KF02-0AB0 SM331, 8AI, 9/12/14Bit	6ES7331-7HF01-0AB0 SM331, 8AI, 14BIT, 0,052MS/channel	6ES7331-1KF02-0AB0 SM331, 8AI, 13bit	6ES7331-7KB02-0AB0 SM331, 2AI, 9/12/14Bit
<b>Input ranges (rated values), thermocouples</b>				
• Type B	No		No	No
• Type C	No		No	
• Type E	Yes		No	Yes
• Type J	Yes		No	Yes
• Type K	Yes		No	Yes
• Type L	Yes		No	No
• Type N	Yes		No	Yes
• Type R	No		No	No
• Type S	No		No	No
• Type T	No		No	No
• Type U	No		No	No
• Type TXK/TXK(L) to GOST	No		No	No
<b>Input ranges (rated values), resistance thermometer</b>				
• Cu 10	No		No	No
• Ni 100	Yes; Standard		Yes; Standard/climate	Yes
• Ni 1000	No		Yes	No
• LG-Ni 1000	No		Yes; Standard/climate	No
• Ni 120	No		No	No
• Ni 200	No		No	No
• Ni 500	No		No	No
• Pt 100	Yes; Standard		Yes; Standard/climate	Yes
• Pt 1000	No		No	No
• Pt 200	No		No	No
• Pt 500	No		No	No
<b>Input ranges (rated values), resistors</b>				
• 0 to 150 ohms	Yes		No	Yes
• 0 to 300 ohms	Yes		No	Yes
• 0 to 600 ohms	Yes		Yes	Yes
• 0 to 6000 ohms	No		Yes	No
<b>Thermocouple (TC)</b>				
<b>Temperature compensation</b>				
- parameterizable	Yes		No	Yes
- internal temperature compensation	Yes		No	Yes
- external temperature compensation with compensations socket	Yes		No	Yes
- for definable comparison point temperature	Yes			Yes
<b>Characteristic linearization</b>				
• parameterizable	Yes		Yes	Yes
- for thermocouples	Type E, J, K, L, N		No	Type E, J, K, L, N
- for resistance thermometer	Pt100 (standard, climatic range), Ni100 (standard, climatic range)		yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.	Pt100 (standard, climatic range), Ni100 (standard, climatic range)
<b>Cable length</b>				
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m	200 m; max. 50 m at 50 mV	200 m; 50 m at 80 mV and thermocouples
<b>Analog value generation for the inputs</b>				
<b>Integration and conversion time/resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	15 bit; Unipolar: 9/12/12/14 bit; bipolar: 9 bit + sign/12 bit + sign/12 bit + sign/14 bit + sign	14 bit; Unipolar: 14 bit; bipolar: 13 bit + sign	13 bit	15 bit; Unipolar: 9/12/12/14 bit; bipolar: 9 bit + sign/12 bit + sign/12 bit + sign/14 bit + sign
• Integration time, parameterizable	Yes	Yes	Yes	Yes
• Basic conversion time (ms)		52 µs per channel		

**Technical specifications**

Article number	<b>6ES7331-7KF02-0AB0</b> SM331, 8AI, 9/12/14Bit	<b>6ES7331-7HF01-0AB0</b> SM331, 8AI, 14BIT, 0,052MS/channel	<b>6ES7331-1KF02-0AB0</b> SM331, 8AI, 13bit	<b>6ES7331-7KB02-0AB0</b> SM331, 2AI, 9/12/14Bit
<b>Analog value generation for the inputs</b> (continued)				
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	none / 400 / 60 / 50 Hz		400 / 60 / 50 / 10 Hz
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
• for voltage measurement	Yes		Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes	Yes; with external supply	Yes
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes		Yes	Yes
• for resistance measurement with three-wire connection	Yes		Yes	Yes
• for resistance measurement with four-wire connection	Yes		Yes	Yes
<b>Errors/accuracies</b>				
<b>Operational error limit in overall temperature range</b>				
• Voltage, relative to input range, (+/-)	1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V)	0.4 %	0.6 %; ±0.6 % (±5 V, 10 V, 1 to 5 V, 0 to 10 V); ±0.5 % (±50 mV, 500 mV, 1 V)	1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V)
• Current, relative to input range, (+/-)	0.7 %; From 3.2 to 20 mA	0.3 %	0.5 %; ±20 mA, 0 to 20 mA, 4 to 20 mA	0.7 %; From 3.2 to 20 mA
• Resistance, relative to input range, (+/-)	0.7 %; 150, 300, 600 Ohm		0.5 %; 0 to 6 kohms, 0 to 600 kohms	0.7 %; 150, 300, 600 Ohm kohms
• Resistance thermometer, relative to input range, (+/-)	0.7 %; ±0.7 % (Pt100/ Ni100); ±0.8 % (Pt100 climate)		1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)	0.7 %; ±0.7 % (Pt100/ Ni100); ±0.8 % (Pt100 climate)
• Thermocouple, relative to input range, (+/-)	1.1 %; Type E, J, K, L, N			1.1 %; Type E, J, K, L, N
<b>Basic error limit (operational limit at 25 °C)</b>				
• Voltage, relative to input range, (+/-)	0.6 %; ±0.4 % (250 mV to 1 000 mV); ±0.6 % (2.5 mV to 10 mV); ±0.7 % (80 mV)	0.25 %	0.4 %; 0.4% (±5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (±50 mV, 500 mV, 1 V)	0.6 %; ±0.6% (80 mV, 2.5 V to 10 V); ±0.4% (250 mV to 1 000 mV)
• Current, relative to input range, (+/-)	0.5 %; 3.2 to 20 mA	0.2 %	0.3 %; ±20 mA, 0 to 20 mA, 4 to 20 mA	0.5 %; 3.2 to 20 mA
• Resistance, relative to input range, (+/-)	0.5 %; 150, 300, 600 Ohm		0.3 %; 0 to 6 kohms, 0 to 600 kohms	0.5 %; 150, 300, 600 Ohm
• Resistance thermometer, relative to input range, (+/-)	0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate)		1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic)	0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate)
• Thermocouple, relative to input range, (+/-)	0.7 %; Type E, N, J, K, L			0.7 %; Type E, N, J, K, L
<b>Interrupts/diagnostics/status information</b>				
Diagnostics function	Yes; Parameterizable	Yes	No	Yes; Parameterizable
<b>Alarms</b>				
• Diagnostic alarm	Yes; Parameterizable, channels 0 and 2	Yes; Parameterizable	No	Yes
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable, channels 0 and 2	No	Yes; Parameterizable, channel 0
<b>Connection method</b>				
required front connector	20-pin	20-pin	40-pin	20-pin
<b>Dimensions</b>				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm	120 mm
<b>Weights</b>				
Weight, approx.	250 g	230 g	250 g	250 g

## SIMATIC S7-300 Advanced Controllers

I/O modules

Analog modules

## SM 331 analog input modules

## Technical specifications

Article number	6ES7331-7PF01-0AB0	6ES7331-7PF11-0AB0	6ES7331-7PE10-0AB0	6ES7331-7NF00-0AB0	6ES7331-7NF10-0AB0
	SM331, 8AI, resistor, PT100/200/1000, .	SM331, 8AI, 16BIT, Thermocouples	SM331, 6AI, 16bit, Thermocouple	SM331, 8AI, +/-5/10V, 1-5V, +/-20mA, 0/4-20mA	SM331, 8AI, +/-5/10V, 1-5V, +/-20mA, 0/4-20mA
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)	24 V	24 V	24 V		24 V
<b>Input current</b>					
from load voltage L+ (without load), max.	240 mA	240 mA	150 mA		200 mA
from backplane bus 5 V DC, max.	100 mA	100 mA	100 mA	130 mA	100 mA
<b>Power loss</b>					
Power loss, typ.	4.6 W	3 W	2.2 W	0.6 W	3 W
<b>Analog inputs</b>					
Number of analog inputs	8	8	6	8	8
• For resistance measurement	8				
permissible input voltage for voltage input (destruction limit), max.	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	75 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	35 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	50 V; Permanent	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.				32 mA	40 mA
<b>Input ranges (rated values), voltages</b>					
• 0 to +10 V	No	No	No	No	No
• 1 V to 5 V	No	No	No	Yes	Yes
• 1 V to 10 V	No	No	No	No	No
• -1 V to +1 V	No	No	Yes	No	No
• -10 V to +10 V	No	No	No	Yes	Yes
• -2.5 V to +2.5 V	No	No	No	No	No
• -250 mV to +250 mV	No	No	Yes	No	No
• -5 V to +5 V	No	No	No	Yes	Yes
• -50 mV to +50 mV	No	No	Yes	No	No
• -500 mV to +500 mV	No	No	Yes	No	No
• -80 mV to +80 mV	No	No	Yes	No	No
<b>Input ranges (rated values), currents</b>					
• 0 to 20 mA	No	No	No	Yes	Yes
• -10 mA to +10 mA	No	No	No	No	No
• -20 mA to +20 mA	No	No	No	Yes	Yes
• -3.2 mA to +3.2 mA	No	No	No	No	No
• 4 mA to 20 mA	No	No	No	Yes	Yes
<b>Input ranges (rated values), thermocouples</b>					
• Type B	No	Yes	Yes	No	No
• Type C	No	Yes	Yes	No	No
• Type E	No	Yes	Yes	No	No
• Type J	No	Yes	Yes	No	No
• Type K	No	Yes	Yes	No	No
• Type L	No	Yes	Yes	No	No
• Type N	No	Yes	Yes	No	No
• Type R	No	Yes	Yes	No	No
• Type S	No	Yes	Yes	No	No
• Type T	No	Yes	Yes	No	No
• Type U	No	Yes	Yes	No	No
• Type TXK/TXK(L) to GOST	No	Yes	Yes	No	No

## Technical specifications

Article number	6ES7331-7PF01-0AB0	6ES7331-7PF11-0AB0	6ES7331-7PE10-0AB0	6ES7331-7NF00-0AB0	6ES7331-7NF10-0AB0
	SM331, 8AI, resistor, PT100/200/1000, .	SM331, 8AI, 16BIT, Thermocouples	SM331, 6AI, 16bit, Thermocouple	SM331,8AI,+/-5/10V, 1-5V,+/-20mA, 0/4-20mA	SM331,8AI,+/-5/10V, 1-5V,+/-20mA, 0/4-20mA
<b>Input ranges (rated values), resistance thermometer</b>					
• Cu 10	Yes	No	No	No	No
• Ni 100	Yes	No	No	No	No
• Ni 1000	Yes	No	No	No	No
• LG-Ni 1000	Yes	No	No	No	No
• Ni 120	Yes	No	No	No	No
• Ni 200	Yes	No	No	No	No
• Ni 500	Yes	No	No	No	No
• Pt 100	Yes	No	No	No	No
• Pt 1000	Yes	No	No	No	No
• Pt 200	Yes	No	No	No	No
• Pt 500	Yes	No	No	No	No
<b>Input ranges (rated values), resistors</b>					
• 0 to 150 ohms	Yes	No	No	No	No
• 0 to 300 ohms	Yes	No	No	No	No
• 0 to 600 ohms	Yes	No	No	No	No
• 0 to 6000 ohms		No	No	No	No
<b>Thermocouple (TC)</b>					
<b>Temperature compensation</b>					
- parameterizable		Yes	Yes		
- internal temperature compensation		Yes	Yes		
- external temperature compensation with Pt100		Yes	Yes		
- external temperature compensation with compensations socket		Yes	Yes		
- for definable comparison point temperature		Yes	Yes		
<b>Characteristic linearization</b>					
• parameterizable	Yes	Yes	Yes		
- for thermocouples		Type B, E, J, K, L, N, R, S, T, U, C	Type B, E, J, K, L, N, R, S, T, U, C, TXK, XK(L)		
- for resistance thermometer	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10; (standard/climate)		No		
<b>Cable length</b>					
• shielded, max.	200 m	100 m	200 m	200 m	200 m
<b>Analog value generation for the inputs</b>					
<b>Integration and conversion time/ resolution per channel</b>					
• Resolution with overrange (bit including sign), max.	16 bit; Two's complement	16 bit; Two's complement	16 bit; Two's complement	16 bit; Unipolar: 15/15/15/15 bit; bipolar: 15 bit + sign/ 15 bit + sign/15 bit + sign/15 bit + sign	16 bit; Unipolar: 15/15/15/15 bit; bipolar: 15 bit + sign/ 15 bit + sign/15 bit + sign/15 bit + sign
• Integration time, parameterizable	Yes	Yes	Yes	Yes; 10/ 16.67/ 20/ 100 ms	Yes
• Basic conversion time (ms)	up to 4 channels: 10 ms per module, over 5 channels: 190 ms per module, 8 channels: 80 ms	Up to 4 channels: 10 ms per module, 5 channels upwards: 190 ms per module	30 / 50 / 60 / 300 ms		10 ms (4-channel mode); 95/83/72/23 ms (8-channel mode)
• Integration time (ms)			10/ 16.67/ 20/ 100 ms		
• Interference voltage suppression for interference frequency f1 in Hz				400 / 60 / 50 / 10 Hz	400 / 60 / 50 Hz, combinations of 400, 60, 50 Hz

# SIMATIC S7-300 Advanced Controllers

I/O modules

Analog modules

## SM 331 analog input modules

### Technical specifications

Article number	6ES7331-7PF01-0AB0	6ES7331-7PF11-0AB0	6ES7331-7PE10-0AB0	6ES7331-7NF00-0AB0	6ES7331-7NF10-0AB0
	SM331, 8AI, resistor, PT100/200/1000, .	SM331, 8AI, 16BIT, Thermocouples	SM331, 6AI, 16bit, Thermocouple	SM331, 8AI, +/-5/10V, 1-5V, +/-20mA, 0/4-20mA	SM331, 8AI, +/-5/10V, 1-5V, +/-20mA, 0/4-20mA
<b>Encoder</b>					
<b>Connection of signal encoders</b>					
<ul style="list-style-type: none"> <li>for voltage measurement</li> <li>for current measurement as 2-wire transducer</li> </ul>			Yes	Yes	Yes
<ul style="list-style-type: none"> <li>for current measurement as 4-wire transducer</li> </ul>				Yes; with external transmitter; possible with separate supply for transmitter	Yes; with external transmitter, current supply; possible with separate supply for transmitter
<ul style="list-style-type: none"> <li>for resistance measurement with two-wire connection</li> </ul>	Yes; without resistance correction				
<ul style="list-style-type: none"> <li>for resistance measurement with three-wire connection</li> </ul>	Yes				
<ul style="list-style-type: none"> <li>for resistance measurement with four-wire connection</li> </ul>	Yes			Yes	Yes
<b>Errors/accuracies</b>					
<b>Operational error limit in overall temperature range</b>					
<ul style="list-style-type: none"> <li>Voltage, relative to input range, (+/-)</li> </ul>			Operating error at 0 ... 60 °C: ±0.12% @ ±25 mV, ±0.08% @ ±50 mV, ±0.6% @ ±80 mV, ±0.05% @ ±250 mV, ±0.05% @ 500 mV, ±0.05% @ ±1 V	0.1 %; At Ucm = 0 V or ±0.7 % at Ucm = 50 V	0.1 %
<ul style="list-style-type: none"> <li>Current, relative to input range, (+/-)</li> </ul>				0.3 %; At Ucm = 0 V or ±0.9 % at Ucm = 50 V	0.1 %
<ul style="list-style-type: none"> <li>Resistance, relative to input range, (+/-)</li> </ul>	0.1 %				
<ul style="list-style-type: none"> <li>Thermocouple, relative to input range, (+/-)</li> </ul>		Type T: ±0.18%, Type U: ±0.15%, Type E: ±0.12%, Type J: ±0.12%, Type L: ±0.17%, Type K: ±0.15%, Type N: ±0.17%, Type R: ±0.08%, Type S: ±0.10%, Type B: ±0.13%, Type C: ±0.10%, TXK/XK(L): ±1.00% accuracy in the lower range of the characteristic curve	See manual for details		
<b>Basic error limit (operational limit at 25 °C)</b>					
<ul style="list-style-type: none"> <li>Voltage, relative to input range, (+/-)</li> </ul>			See manual for details	0.05 %	0.05 %
<ul style="list-style-type: none"> <li>Current, relative to input range, (+/-)</li> </ul>				0.05 %	0.05 %
<ul style="list-style-type: none"> <li>Resistance, relative to input range, (+/-)</li> </ul>	0.05 %				
<ul style="list-style-type: none"> <li>Resistance thermometer, relative to input range, (+/-)</li> </ul>	±0.5 K				

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## Technical specifications

Article number	6ES7331-7PF01-0AB0	6ES7331-7PF11-0AB0	6ES7331-7PE10-0AB0	6ES7331-7NF00-0AB0	6ES7331-7NF10-0AB0
	SM331, 8AI, resistor, PT100/200/1000, .	SM331, 8AI, 16BIT, Thermocouples	SM331, 6AI, 16bit, Thermocouple	SM331, 8AI, +/-5/10V, 1-5V, +/-20mA, 0/4-20mA	SM331, 8AI, +/-5/10V, 1-5V, +/-20mA, 0/4-20mA
• Thermocouple, relative to input range, (+/-)		Type T: ±0.13%, Type U: ±0.08%, Type E: ±0.05%, Type J: ±0.04%, Type L: ±0.06%, Type K: ±0.04%, Type N: ±0.04%, Type R: ±0.03%, Type S: ±0.03%, Type B: ±0.05%, Type C: ±0.02%, TXK/XK(L): ±0.67 % accuracy in the lower range of the characteristic curve	See manual for details		
<b>Interrupts/diagnostics/status information</b>					
Diagnostics function	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Alarms</b>					
• Diagnostic alarm	Yes; Parameterizable per group	Yes; Parameterizable per group	Yes; channel by channel	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable, channels 0 and 2	Yes; Parameterizable all channels (end of cycle interrupt is also supported across modules)
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7	Yes; Parameterizable, channels 0 to 7	Yes; Parameterizable		Yes; Parameterizable, channels 0 to 7 (on exceeding limit value), at end of cycle
<b>Connection method</b>					
required front connector	40-pin	40-pin	40-pin	40-pin	40-pin
<b>Dimensions</b>					
Width	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	117 mm	117 mm
<b>Weights</b>					
Weight, approx.	272 g	272 g	272 g	272 g	272 g

# SIMATIC S7-300 Advanced Controllers

I/O modules

Analog modules

## SM 332 analog output modules

### Overview



- Analog outputs
- For the connection of analog actuators

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### Ordering data

#### SM 332 analog output modules

Incl. labeling strips, bus connector

4 outputs, 11/12 bit

6ES7332-5HD01-0AB0

4 outputs, 16 bit

6ES7332-7ND02-0AB0

2 outputs, 11/12 bit

6ES7332-5HB01-0AB0

8 outputs, 11/12 bit

6ES7332-5HF00-0AB0

#### Front connector

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0

6ES7392-1AJ00-1AB0

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BJ00-0AA0

6ES7392-1BJ00-1AB0

40-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AM00-0AA0

6ES7392-1AM00-1AB0

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BM01-0AA0

6ES7392-1BM01-1AB0

#### Front door, elevated design

6ES7328-0AA00-7AA0

e.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG wires

#### SIMATIC TOP connect

See page 5/242

#### Bus connectors

1 unit (spare part)

6ES7390-0AA00-0AA0

#### Shield connection element

6ES7390-5AA00-0AA0

80 mm wide, with 2 rows for 4 shield connection clamps each

#### Shield connection clamps

2 units

For 2 cables with 2 mm to 6 mm diameter

6ES7390-5AB00-0AA0

For 1 cable with 3 mm to 8 mm diameter

6ES7390-5BA00-0AA0

For 1 cable with 4 mm to 13 mm diameter

6ES7390-5CA00-0AA0

### Article No.

#### Label cover

10 units (spare part), for modules with 20-pin front connector

6ES7392-2XY00-0AA0

#### Labeling strips

10 units (spare part), for modules with 20-pin front connector

6ES7392-2XX00-0AA0

#### Labeling sheets for machine labeling

For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

Petrol

6ES7392-2AX00-0AA0

Light beige

6ES7392-2BX00-0AA0

Yellow

6ES7392-2CX00-0AA0

Red

6ES7392-2DX00-0AA0

For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units

Petrol

6ES7392-2AX10-0AA0

Light beige

6ES7392-2BX10-0AA0

Yellow

6ES7392-2CX10-0AA0

Red

6ES7392-2DX10-0AA0

#### SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current "Manual Collection" DVD and the three subsequent updates



## Technical specifications

Article number	6ES7332-5HB01-0AB0 SM332, 2AA, U/I, 11/12Bit	6ES7332-5HD01-0AB0 SM332, 4AO, U/I, 11/12Bit	6ES7332-5HF00-0AB0 SM332, 8AA, U/I, 11/12Bit	6ES7332-7ND02-0AB0 SM332, 4AA, 0-10V, 0-5V, +/-10V,+/-20mA
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
• Rated value (DC)	24 V	24 V	24 V	24 V
<b>Input current</b>				
from load voltage L+ (without load), max.	135 mA	240 mA	340 mA	290 mA
from backplane bus 5 V DC, max.	60 mA	60 mA	100 mA	120 mA
<b>Power loss</b>				
Power loss, typ.	3 W	3 W	6 W	3 W
<b>Analog outputs</b>				
Number of analog outputs	2	4	8	4; Isochronous mode
Voltage output, short-circuit protection	Yes	Yes	Yes	Yes
Voltage output, short-circuit current, max.	25 mA	25 mA	25 mA	40 mA
Current output, no-load voltage, max.	18 V	18 V	18 V	18 V
<b>Output ranges, voltage</b>				
• 0 to 10 V	Yes	Yes	Yes	Yes
• 1 V to 5 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
<b>Output ranges, current</b>				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes
<b>Load impedance (in rated range of output)</b>				
• with voltage outputs, min.	1 k $\Omega$	1 k $\Omega$	1 k $\Omega$	1 k $\Omega$
• with voltage outputs, capacitive load, max.	1 $\mu$ F	1 $\mu$ F	1 $\mu$ F	1 $\mu$ F
• with current outputs, max.	500 $\Omega$	500 $\Omega$	500 $\Omega$	500 $\Omega$
• with current outputs, inductive load, max.	10 mH	10 mH	10 mH	1 mH
<b>Cable length</b>				
• shielded, max.	200 m	200 m	200 m	200 m
<b>Analog value generation for the outputs</b>				
<b>Integration and conversion time/resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	12 bit; $\pm 10$ V, $\pm 20$ mA, 4 mA to 20 mA, 1 V to 5 V: 11 bit + sign; 0 V to 10 V, 0 mA to 20 mA: 12 bit	12 bit; $\pm 10$ V, $\pm 20$ mA, 4 mA to 20 mA, 1 V to 5 V: 11 bit + sign; 0 V to 10 V, 0 mA to 20 mA: 12 bit	12 bit; $\pm 10$ V, $\pm 20$ mA, 4 mA to 20 mA, 1 V to 5 V: 11 bit + sign; 0 V to 10 V, 0 mA to 20 mA: 12 bit	16 bit
• Conversion time (per channel)	0.8 ms	0.8 ms	0.8 ms	200 $\mu$ s; in isochronous mode 640 $\mu$ s
<b>Settling time</b>				
• for resistive load	0.2 ms	0.2 ms	0.2 ms	0.2 ms
• for capacitive load	3.3 ms	3.3 ms	3.3 ms	3.3 ms
• for inductive load	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Analog modules

**SM 332 analog output modules****Technical specifications**

Article number	<b>6ES7332-5HB01-0AB0</b> SM332, 2AA, U/I, 11/12Bit	<b>6ES7332-5HD01-0AB0</b> SM332, 4AO, U/I, 11/12Bit	<b>6ES7332-5HF00-0AB0</b> SM332, 8AA, U/I, 11/12Bit	<b>6ES7332-7ND02-0AB0</b> SM332, 4AA, 0-10V, 0-5V, +/-10V,+/-20mA
<b>Errors/accuracies</b>				
<b>Operational error limit in overall temperature range</b>				
• Voltage, relative to output range, (+/-)	0.5 %	0.5 %	0.5 %	0.12 %
• Current, relative to output range, (+/-)	0.6 %	0.6 %	0.6 %	0.18 %
<b>Basic error limit (operational limit at 25 °C)</b>				
• Voltage, relative to output range, (+/-)	0.4 %	0.4 %	0.4 %	0.02 %
• Current, relative to output range, (+/-)	0.5 %	0.5 %	0.5 %	0.02 %
<b>Interrupts/diagnostics/status information</b>				
Diagnostics function	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Alarms</b>				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Connection method</b>				
required front connector	20-pin	20-pin	40-pin	20-pin
<b>Dimensions</b>				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm	117 mm
<b>Weights</b>				
Weight, approx.	220 g	220 g	272 g	220 g

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## Overview



- Analog inputs and outputs
- For the connection of analog sensors and actuators

Ordering data	Article No.		Article No.
<b>SM 334 analog input/output modules</b> Incl. labeling strips, bus connector 4 inputs, 2 outputs 4 inputs, 2 outputs, resistance measurement, Pt 100	<b>6ES7334-0CE01-0AA0</b> <b>6ES7334-0KE00-0AB0</b>	<b>Label cover</b> 10 units (spare part), for modules with 20-pin front connector	<b>6ES7392-2XY00-0AA0</b>
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units 20-pin, with spring-loaded terminals • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b> <b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>	<b>Labeling strips</b> 10 units (spare part), for modules with 20-pin front connector	<b>6ES7392-2XX00-0AA0</b>
<b>Front door, elevated design</b> e.g. for 32-channel modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires	<b>6ES7328-0AA00-7AA0</b>	<b>Labeling sheets for machine labeling</b> For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units Petrol Light beige Yellow Red	<b>6ES7392-2AX00-0AA0</b> <b>6ES7392-2BX00-0AA0</b> <b>6ES7392-2CX00-0AA0</b> <b>6ES7392-2DX00-0AA0</b>
<b>SIMATIC TOP connect</b>	See page 5/242	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>Shield connection element</b> 80 mm wide, with 2 rows for 4 shield connection clamps each	<b>6ES7390-5AA00-0AA0</b>		
<b>Shield connection clamps</b> 2 units For 2 cables with 2 mm to 6 mm diameter For 1 cable with 3 mm to 8 mm diameter For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5AB00-0AA0</b> <b>6ES7390-5BA00-0AA0</b> <b>6ES7390-5CA00-0AA0</b>		

# SIMATIC S7-300 Advanced Controllers

I/O modules

Analog modules

## SM 334 analog input/output modules

### Technical specifications

Article number	<b>6ES7334-0CE01-0AA0</b> SM334, 4AI, 2AO, non isolated	<b>6ES7334-0KE00-0AB0</b> SM334, 4AI/2AO, 0-10V f.PT100
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from supply and load voltage L+ (without load), max.	110 mA	80 mA
from backplane bus 5 V DC, max.	55 mA	60 mA
<b>Power loss</b>		
Power loss, typ.	3 W	2 W
<b>Analog inputs</b>		
Number of analog inputs	4	4
• For voltage measurement	4	2
• For resistance measurement		4
permissible input voltage for voltage input (destruction limit), max.	20 V	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	
Cycle time (all channels) max.	5 ms	85 ms
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
<b>Input ranges (rated values), resistance thermometer</b>		
• Pt 100		Yes; only climatic range
<b>Input ranges (rated values), resistors</b>		
• 0 to 10000 ohms		Yes
<b>Characteristic linearization</b>		
• parameterizable		Yes
- for resistance thermometer		Pt100 (climate)
<b>Cable length</b>		
• shielded, max.	200 m	100 m
<b>Analog outputs</b>		
Number of analog outputs	2	2
Voltage output, short-circuit protection	Yes	Yes
Voltage output, short-circuit current, max.	11 mA	30 mA
Current output, no-load voltage, max.	15 V	
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	Yes
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	5 k $\Omega$	2.5 k $\Omega$
• with voltage outputs, capacitive load, max.	1 $\mu$ F	1 $\mu$ F
• with current outputs, max.	300 $\Omega$	
• with current outputs, inductive load, max.	1 mH	
<b>Cable length</b>		
• shielded, max.	200 m	100 m

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## Technical specifications

Article number	6ES7334-0CE01-0AA0	6ES7334-0KE00-0AB0
	SM334, 4AI, 2AO, non isolated	SM334, 4AI/2AO, 0-10V f.PT100
<b>Analog value generation for the inputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	8 bit	12 bit
• Integration time, parameterizable	No	Yes
<b>Analog value generation for the outputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	8 bit	12 bit
• Conversion time (per channel)	500 µs	500 µs
<b>Settling time</b>		
• for resistive load	0.3 ms	0.8 ms
• for capacitive load	3 ms	0.8 ms
• for inductive load	0.3 ms	
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	Yes
• for current measurement as 2-wire transducer	No	
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with two-wire connection		Yes
• for resistance measurement with three-wire connection		Yes
• for resistance measurement with four-wire connection		Yes
<b>Errors/accuracies</b>		
<b>Operational error limit in overall temperature range</b>		
• Voltage, relative to input range, (+/-)	0.9 %	0.7 %; 0 to 10V
• Current, relative to input range, (+/-)	0.8 %	
• Resistance, relative to input range, (+/-)		3.5 %
• Resistance thermometer, relative to input range, (+/-)		1 %
• Voltage, relative to output range, (+/-)	0.6 %	1 %
• Current, relative to output range, (+/-)	1 %	
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input range, (+/-)	0.7 %	0.5 %; 0 to 10V
• Current, relative to input range, (+/-)	0.6 %	
• Resistance, relative to input range, (+/-)		2.8 %
• Resistance thermometer, relative to input range, (+/-)		0.8 %
• Voltage, relative to output range, (+/-)	0.5 %	0.85 %
• Current, relative to output range, (+/-)	0.5 %	

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Analog modules

**SM 334 analog input/output modules****Technical specifications**

Article number	<b>6ES7334-0CE01-0AA0</b>	<b>6ES7334-0KE00-0AB0</b>
	SM334, 4AI, 2AO, non isolated	SM334, 4AI/2AO, 0-10V f.PT100
<b>Interrupts/diagnostics/ status information</b>		
Alarms	No	No
Diagnostics function	No	No
<b>Connection method</b>		
required front connector	20-pin	20-pin
<b>Dimensions</b>		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	117 mm	117 mm
<b>Weights</b>		
Weight, approx.	285 g	200 g

**Overview**

- Analog inputs
- For connecting voltage sensors and current sensors, thermocouples, resistors and resistance thermometers

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Ordering data****SIPLUS S7-300 SM 331 analog input modules**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

- 8 inputs, 13-bit resolution
- 2 inputs, 9/12/14-bit resolution
- 8 inputs, 9/12/14-bit resolution
- 8 inputs, enhanced 16-bit resolution
- 8 inputs, enhanced 16-bit resolution, 4-channel mode

Exposure to media

- 8 inputs, for thermal resistors
- 8 inputs, for thermocouples

*For rolling stock railway applications*

Conforms to EN 50155

- 8 inputs, 9/12/14-bit resolution
- 8 inputs, enhanced 16-bit resolution

**Accessories***Mandatory***Front connector**

- 20-pin, with spring-loaded contacts
  - 1 unit
  - 100 units
- 40-pin, with spring-loaded contacts
  - 1 unit
  - 100 units

*Consumables***Front door, elevated design**

E.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG conductors; circuit diagram and nameplates in petrol

**Article No.**

6AG1331-1KF02-7AB0

6AG1331-7KB02-2AB0

6AG1331-7KF02-2AB0

6AG1331-7NF00-2AB0

6AG1331-7NF10-2AB0

6AG1331-7PF01-4AB0

6AG1331-7PF11-4AB0

6AG1331-7KF02-2AB0

6AG1331-7NF00-2AB0

6ES7392-1BJ00-0AA0

6ES7392-1BJ00-1AB0

6ES7392-1BM01-0AA0

6ES7392-1BM01-1AB0

6ES7328-0AA00-7AA0

**Article No.****Bus connectors**

1 unit (spare part)

6ES7390-0AA00-0AA0

**Labeling strips**

10 units; spare part

For modules with 20-pin front connector

6ES7392-2XX00-0AA0

For modules with 40-pin front connector

6ES7392-2XX10-0AA0

**Label cover**

10 units; spare part

For modules with 20-pin front connector

6ES7392-2XY00-0AA0

For modules with 40-pin front connector

6ES7392-2XY10-0AA0

*Documentation***SIMATIC Manual Collection**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

6ES7998-8XC01-8YE0

**SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

6ES7998-8XC01-8YE2

# SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 analog modules

## SIPLUS S7-300 SM 331

### Technical specifications

Article number	6AG1331-1KF02-7AB0	6AG1331-7KB02-2AB0	6AG1331-7KF02-2AB0
Based on	6ES7331-1KF02-0AB0	6ES7331-7KB02-0AB0	6ES7331-7KF02-0AB0
	SIPLUS SM331 8AI	SIPLUS SM331 2AE	SIPLUS SM331 8AI
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-25 °C	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>			
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>			
- to biologically active substances according to EN 60721-3-5			Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5			Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5			Yes; Class 5S3 incl. sand, dust; *
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!



#### Technical specifications

Article number	6AG1331-7NF00-2AB0	6AG1331-7NF10-2AB0	6AG1331-7PF01-4AB0	6AG1331-7PF11-4AB0
Based on	6ES7331-7NF00-0AB0 SIPLUS S7-300 SM331 8AI - 40-pin	6ES7331-7NF10-0AB0 SIPLUS SM331 8AI - 40-pin	6ES7331-7PF01-0AB0 SIPLUS SM331 8AI	6ES7331-7PF11-0AB0 SIPLUS S7-300 SM331 8AI 40-pin
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-25 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
• max.	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/UL hazardous use applies	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>				
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>				
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 analog modules

**SIPLUS S7-300 SM 331****Technical specifications**

Article number	<b>6AG1331-7NF00-2AB0</b>	<b>6AG1331-7NF10-2AB0</b>	<b>6AG1331-7PF01-4AB0</b>	<b>6AG1331-7PF11-4AB0</b>
Based on	<b>6ES7331-7NF00-0AB0</b> SIPLUS S7-300 SM331 8AI - 40-pin	<b>6ES7331-7NF10-0AB0</b> SIPLUS SM331 8AI - 40-pin	<b>6ES7331-7PF01-0AB0</b> SIPLUS SM331 8AI	<b>6ES7331-7PF11-0AB0</b> SIPLUS S7-300 SM331 8AI 40-pin
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

**Overview**

- Analog outputs
- For connection of analog actuators

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Ordering data****Article No.****SIPLUS S7-300 SM 332 analog output modules**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

2 outputs, 11/12-bit

**6AG1332-5HB01-2AB0**

4 outputs, 11/12-bit

**6AG1332-5HD01-7AB0**

8 outputs, 11/12-bit

**6AG1332-5HF00-2AB0**

Exposure to media

4 outputs, 16-bit; only exposure to media

**6AG1332-7ND02-4AB0**

*For rolling stock railway applications*

Conforms to EN 50155

2 outputs, 11/12-bit

**6AG1332-5HB01-2AB0**

**Accessories**

*Mandatory*

**Front connector**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**  
**6ES7392-1BM01-1AB0**

*Consumables*

**Front door, elevated design**

**6ES7328-0AA00-7AA0**

E.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG conductors; circuit diagram and nameplates in petrol

**Article No.****Bus connectors**

1 unit (spare part)

**6ES7390-0AA00-0AA0**

**Labeling strips**

10 units; spare part

For modules with 20-pin front connector

**6ES7392-2XX00-0AA0**

For modules with 40-pin front connector

**6ES7392-2XX10-0AA0**

**Label cover**

10 units; spare part

For modules with 20-pin front connector

**6ES7392-2XY00-0AA0**

For modules with 40-pin front connector

**6ES7392-2XY10-0AA0**

*Documentation*

**SIMATIC Manual Collection**

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 analog modules

**SIPLUS S7-300 SM 332****Technical specifications**

Article number	<b>6AG1332-5HD01-7AB0</b>	<b>6AG1332-7ND02-4AB0</b>	<b>6AG1332-5HB01-2AB0</b>	<b>6AG1332-5HF00-2AB0</b>
Based on	<b>6ES7332-5HD01-0AB0</b> SIPLUS S7-300 SM332 4AA U/I	<b>6ES7332-7ND02-0AB0</b> SIPLUS S7-300 SM332 4AA	<b>6ES7332-5HB01-0AB0</b> SIPLUS S7-300 SM332 2AO	<b>6ES7332-5HF00-0AB0</b> SIPLUS S7-300 SM 332 8AO - 40pol
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin	-25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>				
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>				
- to biologically active substances according to EN 60721-3-5			Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5			Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5			Yes; Class 5S3 incl. sand, dust; *	
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

**Technical specifications**

Article number	<b>6AG1332-5HD01-7AB0</b>	<b>6AG1332-7ND02-4AB0</b>	<b>6AG1332-5HB01-2AB0</b>	<b>6AG1332-5HF00-2AB0</b>
Based on	<b>6ES7332-5HD01-0AB0</b> SIPLUS S7-300 SM332 4AA U/I	<b>6ES7332-7ND02-0AB0</b> SIPLUS S7-300 SM332 4AA	<b>6ES7332-5HB01-0AB0</b> SIPLUS S7-300 SM332 2AO	<b>6ES7332-5HF00-0AB0</b> SIPLUS S7-300 SM 332 8AO - 40pol
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 analog modules

**SIPLUS S7-300 SM 334****Overview**

- Analog inputs and outputs
- For connection of analog sensors and actuators

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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**Ordering data****Article No.****SIPLUS S7-300 SM 334  
analog input/output modules**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

4 inputs, 2 outputs;  
resistance measurement, Pt 100

**6AG1334-0KE00-7AB0****Accessories***Mandatory***Front connector**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**  
**6ES7392-1BM01-1AB0**

*Consumables***Front door, elevated design**

E.g. for 32-channel modules;  
for connecting 1.3 mm<sup>2</sup>/16 AWG  
conductors; circuit diagram and  
nameplates in petrol

**6ES7328-0AA00-7AA0****Bus connectors**

1 unit (spare part)

**6ES7390-0AA00-0AA0****Article No.****Labeling strips**

10 units; spare part

For modules  
with 20-pin front connector

**6ES7392-2XX00-0AA0**

For modules  
with 40-pin front connector

**6ES7392-2XX10-0AA0****Label cover**

10 units; spare part

For modules  
with 20-pin front connector

**6ES7392-2XY00-0AA0**

For modules  
with 40-pin front connector

**6ES7392-2XY10-0AA0***Documentation***SIMATIC Manual Collection**

Electronic manuals on DVD,  
multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection  
update service for 1 year**

Current "Manual Collection" DVD  
and the three subsequent updates

**6ES7998-8XC01-8YE2**

## Technical specifications

Article number	<b>6AG1334-0KE00-7AB0</b>
Based on	<b>6ES7334-0KE00-0AB0</b> SIPLUS S7-300 SM334 4AE 2AA
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1334-0KE00-7AB0</b>
Based on	<b>6ES7334-0KE00-0AB0</b> SIPLUS S7-300 SM334 4AE 2AA
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

**SIMATIC S7-300 Advanced Controllers**

I/O modules

F-digital/analog modules

**SM 326 F-digital input modules - Safety Integrated****Overview**

- Digital inputs for the fail-safe SIMATIC S7 systems
- For connecting:
  - Switches and 2-wire proximity switches
  - Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: with S7-31xF-2 DP
  - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- In standard operation can be used in the same way as S7-300 modules

**Ordering data****Article No.****SM 326 F-digital input module**

24 inputs, 24 V DC

**6ES7326-1BK02-0AB0**

8 inputs, 24 V DC, NAMUR

**6ES7326-1RF01-0AB0****S7 Distributed Safety V5.4 SP5 Update 2 programming tool****Task:**

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

**Requirement:**

Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version

Floating license for 1 user; software and documentation on DVD; license key on USB flash drive

**6ES7833-1FC02-0YA5**

Floating license for 1 user; software, documentation and license key for download<sup>1)</sup>; Email address required for delivery

**6ES7833-1FC02-0YH5****S7 Distributed Safety upgrade**

From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive

**6ES7833-1FC02-0YE5****Article No.****STEP 7 Safety Advanced V17****Task:**

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

**Requirement:**

STEP 7 Professional V17

**Note:**

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

**6ES7833-1FA17-0YA5**

Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery

**6ES7833-1FA17-0YH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



Ordering data	Article No.	Article No.
<b>DIN rail for active bus modules</b> For max. 5 active bus modules for hot swapping function • Length 483 mm (19") • Length 530 mm • Length 620 mm • Length 2 000 mm	<b>6ES7195-1GA00-0XA0</b> <b>6ES7195-1GF30-0XA0</b> <b>6ES7195-1GG30-0XA0</b> <b>6ES7195-1GC00-0XA0</b>	<b>Labeling strips</b> For F-modules (spare part); 10 units <b>6ES7392-2XX20-0AA0</b>
<b>Active bus module</b> BM 1 x 80 for 1 module, 80 mm wide	<b>6ES7195-7HC00-0XA0</b>	<b>Label cover</b> For F-modules (spare part); 10 units <b>6ES7392-2XY20-0AA0</b>
<b>SITOP power supply module</b> For ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	<b>6ES7307-1EA01-0AA0</b>	<b>LK 393 cable guide</b> For F-modules; L+ and M connections; 5 units <b>6ES7393-4AA10-0AA0</b>
<b>Front connector</b> 40-pin, with screw contacts • 1 unit • 100 units 40-pin, with spring-loaded contacts • 1 unit • 100 units	<b>6ES7392-1AM00-0AA0</b> <b>6ES7392-1AM00-1AB0</b> <b>6ES7392-1BM01-0AA0</b> <b>6ES7392-1BM01-1AB0</b>	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC <b>6ES7998-8XC01-8YE0</b>
<b>Front door, higher version, for F-modules</b> For F-modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labels in yellow	<b>6ES7328-7AA10-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates <b>6ES7998-8XC01-8YE2</b>

## Technical specifications

Article number	<b>6ES7326-1RF01-0AB0</b>	<b>6ES7326-1BK02-0AB0</b>
	SM326, 8DE, DC24V, failsafe	SM326, F-DI 24 X DC24V, failsafe
<b>Supply voltage</b>		
Rated value (DC)		24 V
<b>Input current</b>		
from load voltage L+ (without load), max.	160 mA	450 mA
from backplane bus 5 V DC, max.	90 mA	100 mA
<b>Encoder supply</b>		
Number of outputs	8	4; Isolated
<b>Output current</b>		
• Rated value		400 mA
<b>Power loss</b>		
Power loss, typ.	4.5 W	10 W
<b>Digital inputs</b>		
Number of digital inputs	8	24
<b>Input voltage</b>		
• Type of input voltage	DC	DC
• Rated value (DC)		24 V
• for signal "0"		-30 to +5 V
• for signal "1"		+11 to +30V
<b>Input current</b>		
• for signal "1", typ.	2.1 to 7 mA	10 mA
<b>Input delay (for rated value of input voltage)</b>		
<b>for standard inputs</b>		
- at "0" to "1", max.		3.4 ms
<b>for NAMUR inputs</b>		
- at "0" to "1", max.	1.2 to 3 ms	
- at "1" to "0", max.	1.2 to 3 ms	
<b>Cable length</b>		
• shielded, max.	200 m	200 m

**SIMATIC S7-300 Advanced Controllers**

I/O modules

F-digital/analog modules

**SM 326 F-digital input modules - Safety Integrated****Technical specifications**

Article number	<b>6ES7326-1RF01-0AB0</b>	<b>6ES7326-1BK02-0AB0</b>
	SM326, 8DE, DC24V, failsafe	SM326, F-DI 24 X DC24V, failsafe
<b>Encoder</b>		
<b>Connectable encoders</b>		
<ul style="list-style-type: none"> <li>2-wire sensor</li> <li>- permissible quiescent current (2-wire sensor), max.</li> </ul>		Yes; if short-circuit test is deactivated 2 mA
<b>Interrupts/diagnostics/ status information</b>		
Diagnostics function		Yes
<b>Alarms</b>		
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> </ul>	Yes; Parameterizable	Yes
<b>Ex(i) characteristics</b>		
Module for Ex(i) protection	Yes	
<b>maximum values for connecting terminals for gas group IIC</b>		
<ul style="list-style-type: none"> <li>U<sub>o</sub> (no-load voltage), max.</li> <li>I<sub>o</sub> (short-circuit current), max.</li> <li>P<sub>o</sub> (power output), max.</li> <li>C<sub>o</sub> (permissible external capacity), max.</li> <li>L<sub>o</sub> (permissible external inductivity), max.</li> <li>U<sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.</li> </ul>	10 V 13.9 mA 33.1 mW 3 µF 80 mH 60 V DC/30 V AC	
<b>Standards, approvals, certificates</b>		
<b>Highest safety class achievable in safety mode</b>		
<ul style="list-style-type: none"> <li>acc. to DIN VDE 0801</li> <li>acc. to EN 954</li> <li>SIL acc. to IEC 61508</li> </ul>	Cat. 4 SIL 2 (single-channel), SIL 3 (two-channel)	AK 6 Cat. 4 SIL 3
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>max.</li> </ul>	60 °C	
<b>Connection method</b>		
required front connector	1x 40-pin	40-pin
<b>Dimensions</b>		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	482 g	442 g

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## Overview



- Digital outputs for the fail-safe SIMATIC S7 systems
- Two versions (1 x switching to P/P potential, 1 x switching to P/M potential)
- For connecting solenoid valves, DC contactors and indicator lights
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: with S7-31xF DP, S7-31xF PN/DP
  - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-41xF-2 and S7-400F/FH

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## Ordering data

## SM 326 F-digital output module

10 outputs, 24 V DC, 2 A PP;  
width 40 mm

8 outputs, 24 V DC, 2 A PM;  
width 80 mm

S7 Distributed Safety V5.4 SP5  
Update 2 programming tool

## Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

## Requirement:

Windows 7 SP1 (64-bit),  
Windows 10 Professional/Enterprise (64-bit),  
Windows Server 2008 R2 SP1 (64-bit),  
Windows Server 2012 R2 (64-bit),  
Windows Server 2016 (64-bit);  
STEP 7 as of V5.5 SP1;  
Please also consider the operating systems that have been released for the used STEP 7 version

Floating license for 1 user; software and documentation on DVD;  
license key on USB flash drive

Floating license for 1 user;  
software, documentation and license key for download<sup>1)</sup>;  
Email address required for delivery

## S7 Distributed Safety upgrade

From V5.x to V5.4;  
floating license for 1 user; software and documentation on DVD;  
license key on USB flash drive

## Article No.

6ES7326-2BF10-0AB0

6ES7326-2BF41-0AB0

6ES7833-1FC02-0YA5

6ES7833-1FC02-0YH5

6ES7833-1FC02-0YE5

## Article No.

## STEP 7 Safety Advanced V17

## Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

## Requirement:

STEP 7 Professional V17

## Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user;  
license key on USB flash drive

Floating license for 1 user;  
license key for download<sup>1)</sup>;  
Email address required for delivery

6ES7833-1FA17-0YA5

6ES7833-1FA17-0YH5

## DIN rail for active bus modules

For max. 5 active bus modules, for function "Insertion and removal"

- Length 483 mm (19")
- Length 530 mm
- Length 620 mm
- Length 2 000 mm

6ES7195-1GA00-0XA0

6ES7195-1GF30-0XA0

6ES7195-1GG30-0XA0

6ES7195-1GC00-0XA0

## Active bus modules

BM 2 x 40 for accepting  
2 I/O modules each 40 mm wide

6ES7195-7HB00-0XA0

BM 1 x 80 for accepting  
1 I/O module 80 mm wide

6ES7195-7HC00-0XA0

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-300 Advanced Controllers

I/O modules

F-digital/analog modules

## SM 326 F-digital output modules - Safety Integrated

### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>SITOP power supply module</b> For ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	6ES7307-1EA01-0AA0	<b>LK 393 cable guide</b> For F-modules; L+ and M connections, 5 units	6ES7393-4AA10-0AA0
<b>Front connector</b> 40-pin, with screw contacts • 1 unit • 100 units 40-pin, with spring-loaded contacts • 1 unit • 100 units	6ES7392-1AM00-0AA0 6ES7392-1AM00-1AB0 6ES7392-1BM01-0AA0 6ES7392-1BM01-1AB0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	6ES7998-8XC01-8YE0
<b>Front door, higher version, for F-modules</b> For F-modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labels in yellow	6ES7328-7AA10-0AA0	<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	6ES7998-8XC01-8YE2
<b>Labeling strips</b> For F-modules (spare part), 10 units	6ES7392-2XX20-0AA0		
<b>Label cover</b> For F-modules (spare part), 10 units	6ES7392-2XY20-0AA0		

### Technical specifications

Article number	6ES7326-2BF10-0AB0	6ES7326-2BF41-0AB0
	SM326, F-DO10XDC24V/2A PP, failsafe	SM 326, F-DO 8 X DC 24V/2A PM
<b>Supply voltage</b>		
Rated value (DC)	24 V; 1L+	24 V; 1L+
<b>Load voltage L+</b>		
• Rated value (DC)	24 V; 2L+, 3L+	24 V; 2L+, 3L+
<b>Input current</b>		
from supply voltage 1L+, max.	100 mA	75 mA
from load voltage 2L+ (without load), max.	100 mA	100 mA
from load voltage 3L+ (without load), max.	100 mA	100 mA
from backplane bus 5 V DC, max.	100 mA	100 mA
<b>Power loss</b>		
Power loss, typ.	6 W	12 W
<b>Digital outputs</b>		
Number of digital outputs	10	8
Short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to		L+ (-33 V)
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	5 W
<b>Output voltage</b>		
• for signal "1", min.	L+ (-1.0 V)	L+ (-1.0 V)
<b>Output current</b>		
• for signal "1" rated value	2 A	2 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
<b>Switching frequency</b>		
• with resistive load, max.	25 Hz	30 Hz
• with inductive load, max.	25 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz

## Technical specifications

Article number	6ES7326-2BF10-0AB0	6ES7326-2BF41-0AB0
	SM326, F-DO10XDC24V/2A PP, failsafe	SM 326, F-DO 8 X DC 24V/2A PM
<b>Total current of the outputs (per group)</b>		
<b>horizontal installation</b>		
- up to 40 °C, max.	10 A	7.5 A
- up to 60 °C, max.	6 A	5 A
<b>vertical installation</b>		
- up to 40 °C, max.	5 A	5 A
<b>Cable length</b>		
• shielded, max.	1 000 m	200 m; 200 m for SIL 3, AK 6, Cat 4
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes; Parameterizable
<b>Standards, approvals, certificates</b>		
<b>Highest safety class achievable in safety mode</b>		
• acc. to DIN VDE 0801	AK 5 and 6	
• acc. to EN 954	Cat. 4	Cat. 4
• SIL acc. to IEC 61508	SIL 3	SIL 3
<b>Connection method</b>		
required front connector	40-pin	40-pin
<b>Dimensions</b>		
Width	40 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	330 g	465 g

## SIMATIC S7-300 Advanced Controllers

I/O modules

F-digital/analog modules

### SM 336 F-analog input modules - Safety Integrated

#### Overview



- Analog inputs for fail-safe SIMATIC S7 systems
- Can be used in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIMATIC S7-31xF-2 DP
- Properties of the SM 336; F-AI 6 x 0/4 ... 20 mA HART:
  - 6 analog inputs with galvanic isolation between channels and backplane bus
  - Input ranges: 0 mA to 20 mA, 4 mA to 20 mA
  - Short-circuit-proof power supply of 2- or 4-wire transmitters via the module
  - External encoder supply possible
  - Can be used in safety mode
  - HART communication
  - Firmware update using HW Config
  - Identification data

#### Ordering data

#### Article No.

##### SM 336 F-analog input module

6 inputs, 15 bits,  
0/4 ... 20 mA HART

6ES7336-4GE00-0AB0

##### S7 Distributed Safety V5.4 SP5 Update 2 programming tool

###### Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

###### Requirement:

Windows 7 SP1 (64-bit),  
Windows 10 Professional/Enterprise (64-bit),  
Windows Server 2008 R2 SP1 (64-bit),  
Windows Server 2012 R2 (64-bit),  
Windows Server 2016 (64-bit);  
STEP 7 as of V5.5 SP1;  
Please also consider the operating systems that have been released for the used STEP 7 version

Floating license for 1 user; software and documentation on DVD;  
license key on USB flash drive

6ES7833-1FC02-0YA5

Floating license for 1 user;  
software, documentation and license key for download<sup>1)</sup>;  
Email address required for delivery

6ES7833-1FC02-0YH5

##### S7 Distributed Safety upgrade

From V5.x to V5.4;  
floating license for 1 user; software and documentation on DVD;  
license key on USB flash drive

6ES7833-1FC02-0YE5

#### Article No.

##### STEP 7 Safety Advanced V17

###### Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

###### Requirement:

STEP 7 Professional V17

###### Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user;  
license key on USB flash drive

6ES7833-1FA17-0YA5

Floating license for 1 user;  
license key for download<sup>1)</sup>;  
Email address required for delivery

6ES7833-1FA17-0YH5

##### DIN rail for active bus modules

For max. 5 active bus modules for hot swapping function

- Length 483 mm
- Length 530 mm
- Length 620 mm
- Length 2 000 mm

6ES7195-1GA00-0XA0

6ES7195-1GF30-0XA0

6ES7195-1GG30-0XA0

6ES7195-1GC00-0XA0

##### Active bus module BM 2x40

6ES7195-7HB00-0XA0

Bus module for accepting  
2 I/O modules each 40 mm wide

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Ordering data	Article No.
<b>SITOP power supply module</b> For ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	6ES7307-1EA01-0AA0	<b>LK 393 cable guide</b> For F-modules; L+ and M connections, 5 units	6ES7393-4AA10-0AA0
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units 20-pin, with spring-loaded contacts • 1 unit • 100 units	6ES7392-1AJ00-0AA0 6ES7392-1AJ00-1AB0 6ES7392-1BJ00-0AA0 6ES7392-1BJ00-1AB0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	6ES7998-8XC01-8YE0
<b>Front door, higher version, for F-modules</b> For F-modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labels in yellow	6ES7328-7AA10-0AA0	<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	6ES7998-8XC01-8YE2
<b>Labeling strips</b> For F-modules (spare part), 10 units	6ES7392-2XX20-0AA0		
<b>Label cover</b> For F-modules (spare part), 10 units	6ES7392-2XY20-0AA0		

### Technical specifications

Article number	6ES7336-4GE00-0AB0 SM 336, f.AI 6 X 0/4 ... 20mA HART
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
From power supply L+, typ.	150 mA
from backplane bus 5 V DC, max.	90 mA
<b>Power loss</b>	
Power loss, typ.	4.5 W
<b>Analog inputs</b>	
Number of analog inputs	6
permissible input current for current input (destruction limit), max.	40 mA
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit; 15 bit + sign
• Integration time (ms)	20 ms @ 50 Hz, 16.7 ms @ 60 Hz
• Interference voltage suppression for interference frequency f1 in Hz	f=n x (f1 ±0.5 %)
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

Article number	6ES7336-4GE00-0AB0 SM 336, f.AI 6 X 0/4 ... 20mA HART
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
• Current, relative to input range, (+/-)	0.2 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to input range, (+/-)	0.1 %
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• SIL acc. to IEC 61508	SIL 3
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	350 g

## SIMATIC S7-300 Advanced Controllers

I/O modules

F-digital/analog modules

### Safety protector

#### Overview



- Supports mixed operation of fail-safe signal modules in safety mode and S7-300 standard modules in an ET 200M distributed I/O device for achieving Cat. 4 or SIL 3.
- The safety protector is not required if the safety class or safety category to be achieved is less than SIL 3 or Cat. 4, respectively.

When Cat. 4/SIL 3 is required, the safety protector must be implemented in the following situations:

Application	Safety protector must be used
<b>Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP</b> <ul style="list-style-type: none"> <li>• Only fail-safe modules in the tier</li> <li>• Standard and fail-safe modules in the tier</li> </ul>	Yes, behind the CPU Yes, after the last standard module and before the first fail-safe module
<b>Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP in an expansion rack</b> <ul style="list-style-type: none"> <li>• Only fail-safe modules in the tier</li> <li>• Standard and fail-safe modules in the tier</li> </ul>	Yes, after the IM 36x Yes, after the last standard module and before the first fail-safe module
<b>Distributed behind the IM 153-2 with copper connection</b> <ul style="list-style-type: none"> <li>• Only fail-safe modules in the station</li> <li>• Standard and fail-safe modules in the station</li> </ul>	Yes, after the IM 153-2 Yes, after the last standard module and before the first fail-safe module
<b>Distributed behind the IM 153-2 with fiber-optic connection</b> <ul style="list-style-type: none"> <li>• Only fail-safe modules in the station</li> <li>• Standard and fail-safe modules in the station</li> </ul>	No Yes, after the last standard module and before the first fail-safe module

#### Ordering data

#### Article No.

##### Safety protector

For simultaneous operation of fail-safe and standard modules in ET 200M

**6ES7195-7KF00-0XA0**

##### Bus safety protector

For holding the safety protector in ET 200M

**6ES7195-7HG00-0XA0**

#### Technical specifications

Article number	<b>6ES7195-7KF00-0XA0</b> Safety Protector betw. F- and Std-Mod.
<b>General information</b>	
Product type designation	Safety protector
<b>Weights</b>	
Weight, approx.	10 g



**Overview**

- Digital inputs for the fail-safe SIPLUS S7 systems
- For connecting:
  - Switches and 2-wire proximity switches
  - Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: with S7-31xF-2 DP
  - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- In standard operation can be used in the same way as S7-300 modules

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Ordering data****Article No.****Article No.****SIPLUS S7-300 SM 326  
F-digital input**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

24 inputs, 24 V DC, fail-safe, with diagnostics interrupt

**6AG1326-1BK02-2AB0**

8 inputs, 24 V DC, NAMUR, fail-safe

**6AG1326-1RF01-4AB0****Accessories**

*Mandatory*

**Front connector**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0****6ES7392-1BM01-1AB0**

*Accessories for hot swapping function*

**Active bus module**

BM 1 x 80 for 1 module, 80 mm wide

**6AG1195-7HC00-2XA0***Consumables***DIN rail for active bus modules**

For max. 5 active bus modules for hot swapping function

- Length 483 mm (19")
- Length 530 mm
- Length 620 mm
- Length 2 000 mm

**6ES7195-1GA00-0XA0****6ES7195-1GF30-0XA0****6ES7195-1GG30-0XA0****6ES7195-1GC00-0XA0****Front door, elevated design, for F-modules****6ES7328-7AA10-0AA0**

For F-modules; for connecting 1.3 mm<sup>2</sup>/16 AWG wires; wiring diagram and labels in yellow

**Labeling strips****6ES7392-2XX20-0AA0**

For F-modules (spare part); 10 units

**Label cover****6ES7392-2XY20-0AA0**

For F-modules (spare part); 10 units

**LK 393 cable guide****6ES7393-4AA10-0AA0**

For F-modules; L+ and M connections; 5 units

# SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 F-digital/analog modules

## SIPLUS S7-300 SM 326 - Safety Integrated

### Ordering data

### Article No.

### Article No.

*Programming tools and documentation*

#### S7 Distributed Safety V5.4 SP5 Update 2 programming tool

Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

Requirement:

Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version

Floating license for 1 user; software and documentation on DVD; license key on USB flash drive

6ES7833-1FC02-0YA5

Floating license for 1 user; software, documentation and license key for download<sup>1)</sup>; email address required for delivery

6ES7833-1FC02-0YH5

#### S7 Distributed Safety upgrade

From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive

6ES7833-1FC02-0YE5

#### STEP 7 Safety Advanced V17

Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

Requirement:

STEP 7 Professional V17

Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA17-0YA5

Floating license for 1 user, license key for download<sup>1)</sup>; email address required for delivery

6ES7833-1FA17-0YA5

#### SIMATIC Manual Collection

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

6ES7998-8XC01-8YE0

#### SIMATIC Manual Collection update service for 1 year

Current Manual Collection DVD and the three subsequent updates

6ES7998-8XC01-8YE2

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	6AG1326-1BK02-2AB0	6AG1326-1RF01-4AB0
Based on	6ES7326-1BK02-0AB0 SIPLUS S7-300 SM326F DI24	6ES7326-1RF01-0AB0 SIPLUS S7-300 SM326F DI8 NAMUR
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	0 °C; = Tmin
• max.	60 °C; = Tmax; *+70 °C where forced convection with a minimum air velocity of 0.7 m/s through the modules and rated voltage of 24 V ±5 % are ensured. If in the course of maintenance or automatic diagnosis it is determined that the admissible specified parameters have been exceeded, the modules should be subjected to a proof test (function check) by the manufacturer.	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

## Technical specifications

Article number	<b>6AG1326-1BK02-2AB0</b>	<b>6AG1326-1RF01-4AB0</b>
Based on	<b>6ES7326-1BK02-0AB0</b> SIPLUS S7-300 SM326F DI24	<b>6ES7326-1RF01-0AB0</b> SIPLUS S7-300 SM326F DI8 NAMUR
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 F-digital/analog modules

**SIPLUS S7-300 SM 326 - Safety Integrated****Overview**

- Digital outputs for the fail-safe SIMATIC S7 systems
- For connection of solenoid valves, DC contactors and indicator lights
- With integral safety functions for fail-safe operation
- Can be used in fail-safe mode
  - Centrally: with S7-31xF-2 DP
  - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Ordering data****Article No.****SIPLUS S7-300 SM 326  
F-digital output**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

10 outputs, 24 V DC, 2 A, fail-safe

**6AG1326-2BF10-2AB0**

8 outputs, 24 V DC, 2 A, fail-safe, source-sinking output

**6AG1326-2BF41-2AB0****Accessories**

*Mandatory*

**Front connector**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0****6ES7392-1BM01-1AB0**

*Accessories*

*for hot swapping function*

**Active bus module**

BM 2 x 40 for accepting 2 I/O modules, each 40 mm wide

**6AG1195-7HB00-7XA0**

BM 1 x 80 for 1 module, 80 mm wide

**6AG1195-7HC00-2XA0****Article No.**

*Consumables*

**DIN rail for active bus modules**

For max. 5 active bus modules for hot swapping function

- Length 483 mm (19")
- Length 530 mm
- Length 620 mm
- Length 2 000 mm

**6ES7195-1GA00-0XA0****6ES7195-1GF30-0XA0****6ES7195-1GG30-0XA0****6ES7195-1GC00-0XA0****Front door, elevated design, for F-modules****6ES7328-7AA10-0AA0**

For F-modules; for connecting 1.3 mm<sup>2</sup>/16 AWG wires; wiring diagram and labeling strips in yellow

**Labeling strips****6ES7392-2XX20-0AA0**

For F-modules (spare part); 10 units

**Label cover****6ES7392-2XY20-0AA0**

For F-modules (spare part); 10 units

**LK 393 cable guide****6ES7393-4AA10-0AA0**

For F-modules; L+ and M connections; 5 units

Ordering data	Article No.	Article No.
<p><i>Programming tools and documentation</i></p> <p><b>S7 Distributed Safety V5.4 SP5 Update 2 programming tool</b></p> <p>Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP</p> <p>Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used</p> <p>Floating license for 1 user; software and documentation on DVD; license key on USB flash drive</p> <p>Floating license for 1 user; software, documentation and license key for download<sup>1)</sup>; email address required for delivery</p>	<p><b>6ES7833-1FC02-0YA5</b></p> <p><b>6ES7833-1FC02-0YH5</b></p> <p><b>6ES7833-1FC02-0YE5</b></p>	<p><b>STEP 7 Safety Advanced V17</b></p> <p>Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco</p> <p>Requirement: STEP 7 Professional V17</p> <p>Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral part of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.</p> <p>Floating license for 1 user; license key on USB flash drive</p> <p>Floating license for 1 user, license key for download<sup>1)</sup>; email address required for delivery</p> <p><b>SIMATIC Manual Collection</b></p> <p>Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC</p> <p><b>SIMATIC Manual Collection update service for 1 year</b></p> <p>Current Manual Collection DVD and the three subsequent updates</p>
<p><b>S7 Distributed Safety upgrade</b></p> <p>From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive</p>	<p><b>6ES7833-1FC02-0YE5</b></p>	<p><b>6ES7998-8XC01-8YE0</b></p> <p><b>6ES7998-8XC01-8YE2</b></p>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Technical specifications

Article number	6AG1326-2BF10-2AB0	6AG1326-2BF41-2AB0
Based on	6ES7326-2BF10-0AB0 SIPLUS S7-300 SM326F 10 DO	6ES7326-2BF41-0AB0 SIPLUS S7-300 SM326F D08
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C	-25 °C
• max.	60 °C; = T max; *+70 °C when forced convection at a minimum air speed of 0.3 m/s through the modules is ensured. If in the course of maintenance or automatic diagnosis it is determined that the admissible specified parameters have been exceeded, the modules should be subjected to a proof test (function check) by the manufacturer.	60 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 F-digital/analog modules

**SIPLUS S7-300 SM 326 - Safety Integrated****Technical specifications**

Article number	<b>6AG1326-2BF10-2AB0</b>	<b>6AG1326-2BF41-2AB0</b>
Based on	<b>6ES7326-2BF10-0AB0</b> SIPLUS S7-300 SM326F 10 DO	<b>6ES7326-2BF41-0AB0</b> SIPLUS S7-300 SM326F DO8
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

# SIMATIC S7-300 Advanced Controllers

## I/O modules

### SIPLUS S7-300 F-digital/analog modules

#### SIPLUS S7-300 SM 336 - Safety Integrated

## Overview



- Analog inputs for fail-safe SIPLUS S7 systems
- Applicable in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIPLUS S7-31xF-2 DP

- Properties of the SM 336; F-AI 6 x 0/4 ... 20 mA HART:
  - 6 analog inputs with galvanic isolation between channels and backplane bus
  - Input ranges: 0 mA to 20 mA, 4 mA to 20 mA
  - Short-circuit proof power supply of 2 or 4-wire transmitter via the module
  - External encoder supply possible
  - Applicable in safety mode
  - HART communication
  - Firmware update using HW Config
  - Identification data
  - Temperature range -25 ... +70 °C; (+70 °C when ensuring a forced convection with a minimal air velocity of 0.3 m/s through the module. If a violation of the permissible, specified parameters is detected during maintenance or by automatic diagnostics, the modules must be proof-tested by the manufacturer. Without this measure the temperature range is -25...60°C)

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS S7-300 SM 336 F-analog input module</b> <i>For industrial applications with extended ambient conditions</i> <u>Extended temperature range and exposure to media</u> 6 inputs, 15 bits, 0/4 ... 20 mA HART	<b>6AG1336-4GE00-2AB0</b>	<b>Labeling strips</b> For F-modules (spare part); 10 units	<b>6ES7392-2XX20-0AA0</b>
<b>Accessories</b> <i>Mandatory</i> <b>Front connector</b> 20-pin, with spring-loaded contacts <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul>	<b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>	<b>Label cover</b> For F-modules (spare part); 10 units	<b>6ES7392-2XY20-0AA0</b>
<i>Accessories for hot swapping function</i> <b>Active bus module</b> BM 2 x 40 for accepting 2 I/O modules, each 40 mm wide	<b>6AG1195-7HB00-7XA0</b>	<b>LK 393 cable guide</b> For F-modules; L+ and M connections; 5 units	<b>6ES7393-4AA10-0AA0</b>
<i>Consumables</i> <b>DIN rail for active bus modules</b> For max. 5 active bus modules or hot swapping function <ul style="list-style-type: none"> <li>• Length 483 mm (19")</li> <li>• Length 530 mm</li> <li>• Length 620 mm</li> <li>• Length 2 000 mm</li> </ul>	<b>6ES7195-1GA00-0XA0</b> <b>6ES7195-1GF30-0XA0</b> <b>6ES7195-1GG30-0XA0</b> <b>6ES7195-1GC00-0XA0</b>	<i>Programming tools and documentation</i> <b>S7 Distributed Safety V5.4 SP5 Update 2 programming tool</b> Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version	<b>6ES7833-1FC02-0YA5</b>  <b>6ES7833-1FC02-0YH5</b>
<b>Front door, elevated design, for F-modules</b> For F-modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labels in yellow	<b>6ES7328-7AA10-0AA0</b>	Floating license for 1 user; software and documentation on DVD; license key on USB flash drive  Floating license for 1 user; software, documentation and license key for download <sup>1)</sup> ; e-mail address required for delivery	

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 F-digital/analog modules

## SIPLUS S7-300 SM 336 - Safety Integrated

### Ordering data

### Article No.

#### S7 Distributed Safety upgrade

From V5.x to V5.4;  
floating license for 1 user; software  
and documentation on DVD;  
license key on USB flash drive

6ES7833-1FC02-0YE5

#### STEP 7 Safety Advanced V17

##### Task:

Engineering tool for configuring and  
programming fail-safe user  
programs for SIMATIC S7-1200 FC,  
S7-1500F, S7-1500F Software  
Controller, S7-300F, S7-400F,  
WinAC RTX F, ET 200SP F Controller  
and the fail-safe I/O ET 200SP,  
ET 200MP, ET 200S, ET 200M,  
ET 200iSP, ET 200pro and  
ET 200eco

##### Requirement:

STEP 7 Professional V17

##### Note:

As of TIA Portal V16, the  
SIMATIC STEP 7 Safety software is  
an integral component of the  
SIMATIC STEP 7 product setup.  
The functionality of SIMATIC STEP 7  
Safety is activated by means of the  
license key supplied in each case.

Floating license for 1 user;  
license key on USB flash drive

6ES7833-1FA17-0YA5

Floating license for 1 user,  
license key for download<sup>1)</sup>;  
e-mail address required for delivery

6ES7833-1FA17-0YH5

#### SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD,  
multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC sensors,  
SIMATIC NET, SIMATIC PC-based  
automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC software, SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current "Manual Collection" DVD  
and the three subsequent updates

### Technical specifications

Article number

6AG1336-4GE00-2AB0

Based on

6ES7336-4GE00-0AB0

SIPLUS S7-300 SM336 F 6AI 15BIT

#### Ambient conditions

##### Ambient temperature during operation

- min. -25 °C; = Tmin; Startup @ -25 °C
- max. 60 °C; = T max; \*+70 °C when forced convection at a minimum air speed of 0.3 m/s through the modules is ensured. If in the course of maintenance or automatic diagnosis it is determined that the admissible specified parameters have been exceeded, the modules should be subjected to a proof test (function check) by the manufacturer.

##### Altitude during operation relating to sea level

- Installation altitude above sea level, max. 2 000 m
- Ambient air temperature-barometric pressure-altitude Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)

##### Relative humidity

- With condensation, tested in accordance with IEC 60068-2-38, max. 100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

#### Resistance

##### Use in stationary industrial systems

- to biologically active substances according to EN 60721-3-3 Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3 Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); \*
- to mechanically active substances according to EN 60721-3-3 Yes; Class 3S4 incl. sand, dust, \*

##### Use on ships/at sea

- to biologically active substances according to EN 60721-3-6 Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6 Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); \*
- to mechanically active substances according to EN 60721-3-6 Yes; Class 6S3 incl. sand, dust; \*

##### Usage in industrial process technology

- Against chemically active substances acc. to EN 60654-4 Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04 Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)

#### Remark

- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 \* The supplied plug covers must remain in place over the unused interfaces during operation!

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>



## Overview



- Allows combined operation of fail-safe signal modules in safety mode and S7-300 standard modules in an ET 200M.
- The safety protector is not required if the safety class SIL 3 or safety category < Cat. 4 is to be achieved.

### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

## Ordering data

### Article No.

#### SIPLUS F safety protector

For the simultaneous operation of fail-safe and standard modules in the same ET 200M

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

**6AG1195-7KF00-2XA0**

#### Accessories

#### SIPLUS ET 200M bus safety protector F

For the simultaneous operation of fail-safe and standard modules in ET 200 M for the hot swapping function

Extended temperature range and exposure to media

**6AG1195-7HG00-2XA0**

## Technical specifications

Article number	<b>6AG1195-7KF00-2XA0</b>
Based on	<b>6ES7195-7KF00-0XA0</b> SIPLUS S7-300 safety protector
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

## SIMATIC S7-300 Advanced Controllers

I/O modules

Ex digital modules

### Ex digital input modules

#### Overview



- Digital inputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DI NAMUR
- 4 digital inputs in 4 channel modules (single-channel isolation)
- Connectable encoder in accordance with EN 60947-5-6 and NAMUR, optionally with wired or unwired mechanical contacts
- Diagnostics and diagnostics alarm programmable

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#### Ordering data

##### Ex digital input module

4 inputs, isolated, NAMUR

#### Article No.

6ES7321-7RD00-0AB0

##### Front connector

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0

6ES7392-1AJ00-1AB0

##### Front door, elevated design

e.g. for 32 channel modules;  
enables connection of  
1.3 mm<sup>2</sup>/16 AWG wires

6ES7328-0AA00-7AA0

##### LK 393 cable guide

Mandatory for operation  
in Ex-hazard areas

6ES7393-4AA00-0AA0

##### Labeling strips

10 units (spare part), for modules  
with 20-pin front connector

6ES7392-2XX00-0AA0

##### Label cover

10 units (spare part), for modules  
with 20-pin front connector

6ES7392-2XY00-0AA0

##### Labeling sheets for machine inscription

for modules with 20-pin front  
connector, DIN A4, for printing  
with laser printer; 10 units

petrol

6ES7392-2AX00-0AA0

light-beige

6ES7392-2BX00-0AA0

yellow

6ES7392-2CX00-0AA0

red

6ES7392-2DX00-0AA0

#### Article No.

##### SIMATIC Manual Collection

Electronic manuals on DVD,  
multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

6ES7998-8XC01-8YE0

##### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD  
and the three subsequent updates

6ES7998-8XC01-8YE2

## Technical specifications

Article number	<b>6ES7321-7RD00-0AB0</b> SM321, 4DI, DC24V, HAZARDOUS AREAS
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	50 mA
from backplane bus 5 V DC, max.	80 mA
<b>Power loss</b>	
Power loss, typ.	1.1 W
<b>Digital inputs</b>	
Number of digital inputs	4
Number of NAMUR inputs	4
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	8.2 V; from internal power circuit supply
<b>Input current</b>	
• on wire-break, max.	0.1 mA
• on short-circuit, max.	8.5 mA
<b>for NAMUR encoders</b>	
- for signal "0"	0.35 to 1.2 mA
- for signal "1"	2.1 to 7 mA
<b>Input delay (for rated value of input voltage)</b>	
• Input frequency (with a time delay of 0.1 ms), max.	2 kHz
<b>for NAMUR inputs</b>	
- parameterizable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms (plus 0.25 ms preparation time)
<b>Encoder</b>	
<b>Connectable encoders</b>	
• NAMUR encoder	Yes; Two-wire connection
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes

Article number	<b>6ES7321-7RD00-0AB0</b> SM321, 4DI, DC24V, HAZARDOUS AREAS
<b>Ex(i) characteristics</b>	
Module for Ex(i) protection	Yes
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>o</sub> (no-load voltage), max.	10 V
• I <sub>o</sub> (short-circuit current), max.	14.1 mA
• P <sub>o</sub> (power output), max.	33.7 mW
• C <sub>o</sub> (permissible external capacity), max.	3 µF
• L <sub>o</sub> (permissible external inductivity), max.	100 mH
<b>Standards, approvals, certificates</b>	
<b>Use in hazardous areas</b>	
• Test number PTB	Ex-96.D.2094X
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• max.	60 °C
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	230 g

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Ex digital modules

**Ex digital output modules****Overview**

- Digital outputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DO 24 V DC/10mA or 4 DO 15 V DC/20 mA
- 4 digital outputs in 4 channel modules (single-channel isolation)
- Diagnostics and diagnostics alarm programmable
- Substitute value behavior programmable

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**Ordering data****Article No.****Ex digital output modules**

4 outputs, isolated, 24 V DC, 10 mA

**6ES7322-5SD00-0AB0**

4 outputs, isolated, 15 V DC, 20 mA

**6ES7322-5RD00-0AB0****Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0****6ES7392-1AJ00-1AB0****Front door, elevated design**e.g. for 32 channel modules; enables connection of 1.3 mm<sup>2</sup>/16 AWG wires**6ES7328-0AA00-7AA0****LK 393 cable guide**

Mandatory for operation in Ex-hazard areas

**6ES7393-4AA00-0AA0****Labeling strips**

10 units (spare part), for modules with 20-pin front connector

**6ES7392-2XX00-0AA0****Label cover**

10 units (spare part), for modules with 20-pin front connector

**6ES7392-2XY00-0AA0****Labeling sheets for machine inscription**

for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light-beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0****Article No.****SIMATIC Manual Collection**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2**

## Technical specifications

Article number	<b>6ES7322-5SD00-0AB0</b> SM322, 4DO, 24V DC, 10MA, HAZARDOUS AREAS	<b>6ES7322-5RD00-0AB0</b> SM322, 4DO, 15V DC, 20MA, HAZARDOUS AREAS
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from load voltage L+ (without load), max.	160 mA	160 mA
from backplane bus 5 V DC, max.	85 mA	85 mA
<b>Power loss</b>		
Power loss, typ.	3 W	3 W
<b>Digital outputs</b>		
Number of digital outputs	4	4
Short-circuit protection	Yes; Electronic	Yes; Electronic
<b>Load resistance range</b>		
• upper limit	390 Ω; Two-wire connection	200 Ω; Two-wire connection
<b>Output voltage</b>		
• Rated value (DC)	24 V	15 V
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
<b>Interrupts/diagnostics/ status information</b>		
Diagnostics function	Yes	Yes
<b>Ex(i) characteristics</b>		
Module for Ex(i) protection	Yes	Yes
<b>maximum values for connecting terminals for gas group IIC</b>		
• U <sub>o</sub> (no-load voltage), max.	25.2 V	15.75 V
• I <sub>o</sub> (short-circuit current), max.	70 mA	85 mA
• P <sub>o</sub> (power output), max.	440 mW	335 mW
• C <sub>o</sub> (permissible external capacity), max.	90 nF	500 nF
• L <sub>o</sub> (permissible external inductivity), max.	6.7 mH	5 mH
<b>Standards, approvals, certificates</b>		
<b>Use in hazardous areas</b>		
• Test number PTB	Ex-96.D.2093X	Ex-96.D.2102X
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• max.	60 °C	60 °C
<b>Connection method</b>		
required front connector	20-pin	20-pin
<b>Dimensions</b>		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	230 g	230 g

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 Ex digital modules

**SIPLUS S7-300 Ex digital input modules****Overview**

- Digital inputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DI NAMUR
- 4 digital inputs in 4 channel modules (single-channel isolation)
- Connectable encoder in accordance with EN 60947-5-6 and NAMUR, optionally with wired or unwired mechanical contacts
- Programmable diagnostics and diagnostic interrupt

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Ordering data****Article No.****SIPLUS S7-300  
Ex digital input module**Exposure to media

4 inputs, isolated, NAMUR

**6AG1321-7RD00-4AB0****Accessories***Mandatory***Front connector**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0***Consumables***DIN rail for active bus modules**

For max. 5 active bus modules for hot swapping function

- Length 483 mm (19")
- Length 530 mm
- Length 620 mm
- Length 2000 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0**  
**6ES7195-1GG30-0XA0**  
**6ES7195-1GC00-0XA0****Front door, elevated design****6ES7328-0AA00-7AA0**E.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG conductors; circuit diagram and nameplates in petrol**LK 393 cable guide****6ES7393-4AA00-0AA0**

Mandatory for operation in hazardous areas

**Labeling strips****6ES7392-2XX00-0AA0**

10 units (spare part), for modules with 20-pin front connector

**Label cover****6ES7392-2XY00-0AA0**

10 units (spare part), for modules with 20-pin front connector

**Article No.****Labeling sheets  
for machine inscription**

For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

Petrol

**6ES7392-2AX00-0AA0**

Light beige

**6ES7392-2BX00-0AA0**

Yellow

**6ES7392-2CX00-0AA0**

Red

**6ES7392-2DX00-0AA0***Documentation***SIMATIC Manual Collection****6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection  
update service for 1 year****6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

## Technical specifications

Article number	6AG1321-7RD00-4AB0	Article number	6AG1321-7RD00-4AB0
Based on	6ES7321-7RD00-0AB0 SIPLUS S7-300 SM 321 4DI NAMUR	Based on	6ES7321-7RD00-0AB0 SIPLUS S7-300 SM 321 4DI NAMUR
<b>Ambient conditions</b>		<b>Resistance</b>	
<b>Ambient temperature during operation</b>		<b>Use in stationary industrial systems</b>	
• min.	0 °C; = Tmin	- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
• max.	60 °C; = Tmax	- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<b>Altitude during operation relating to sea level</b>		- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
• Installation altitude above sea level, max.	5 000 m	<b>Use on ships/at sea</b>	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<b>Relative humidity</b>		- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
		<b>Usage in industrial process technology</b>	
		- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
		- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
		<b>Remark</b>	
		- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

## SIMATIC S7-300 Advanced Controllers

I/O modules

Ex analog modules

### Ex analog input modules

#### Overview



- Analog inputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 8 or 4 analog inputs in 4 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Diagnostics and diagnostics alarm programmable
- Programmable threshold alarm
- HART-compatible inputs (only 6ES7331-7RD00-0AB0)

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#### Ordering data

##### Ex analog input modules

4 inputs, isolated, 0/4 to 20 mA, 15 bit

#### Article No.

6ES7331-7RD00-0AB0

8/4 inputs, isolated, for thermocouples and Pt100, Pt200, Ni100

6ES7331-7SF00-0AB0

##### Front connector

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0

6ES7392-1AJ00-1AB0

##### Front door, elevated design

e.g. for 32 channel modules; enables connection of 1.3 mm<sup>2</sup>/16 AWG wires

6ES7328-0AA00-7AA0

##### LK 393 cable guide

Mandatory for operation in Ex-hazard areas

6ES7393-4AA00-0AA0

##### Labeling strips

10 units (spare part), for modules with 20-pin front connector

6ES7392-2XX00-0AA0

##### Label cover

10 units (spare part), for modules with 20-pin front connector

6ES7392-2XY00-0AA0

##### Labeling sheets for machine inscription

for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

6ES7392-2AX00-0AA0

light-beige

6ES7392-2BX00-0AA0

yellow

6ES7392-2CX00-0AA0

red

6ES7392-2DX00-0AA0

#### Article No.

##### SIMATIC Manual Collection

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

6ES7998-8XC01-8YE0

##### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7998-8XC01-8YE2



## Technical specifications

Article number	6ES7331-7RD00-0AB0 SIMATIC S7, SM 331 ANALOG INPUT	6ES7331-7SF00-0AB0 SIMATIC S7, SM 331 ANALOG INPUT
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from load voltage L+ (without load), max.	250 mA	
from backplane bus 5 V DC, max.	60 mA	120 mA
<b>Output voltage</b>		
<b>Power supply to the transmitters</b>		
• Rated value (DC)	13 V; at 22 mA	
<b>Power loss</b>		
Power loss, typ.	3 W	0.6 W
<b>Analog inputs</b>		
Number of analog inputs	4	8; 8x thermocouples; 4x RTD thermoresistors
permissible input current for current input (destruction limit), max.	40 mA	
<b>Input ranges (rated values), voltages</b>		
• -1 V to +1 V		Yes
• -25 mV to +25 mV		Yes
• -250 mV to +250 mV		Yes
• -50 mV to +50 mV		Yes
• -500 mV to +500 mV		Yes
• -80 mV to +80 mV		Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Input ranges (rated values), thermocouples</b>		
• Type B		Yes
• Type E		Yes
• Type J		Yes
• Type K		Yes
• Type L		Yes
• Type N		Yes
• Type R		Yes
• Type S		Yes
• Type T		Yes
• Type U		Yes
<b>Input ranges (rated values), resistance thermometer</b>		
• Ni 100		Yes
• Pt 100		Yes
• Pt 200		Yes
<b>Cable length</b>		
• shielded, max.	200 m	200 m; TC: 50 m
<b>Analog value generation for the inputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	16 bit; 10 bit to 15 bit + sign	16 bit; 10 bit to 15 bit + sign
• Integration time, parameterizable	Yes; 2.5 to 100 ms	Yes; 2.5 to 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	10 to 400 Hz	10 to 400 Hz
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for current measurement as 2-wire transducer	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Ex analog modules

**Ex analog input modules****Technical specifications**

Article number	<b>6ES7331-7RD00-0AB0</b> SIMATIC S7, SM 331 ANALOG INPUT	<b>6ES7331-7SF00-0AB0</b> SIMATIC S7, SM 331 ANALOG INPUT
<b>Errors/accuracies</b>		
<b>Operational error limit in overall temperature range</b>		
• Current, relative to input range, (+/-)	0.45 %	
• Resistance thermometer, relative to input range, (+/-)		0.04 %; 0.09 to 0.04%
<b>Basic error limit (operational limit at 25 °C)</b>		
• Current, relative to input range, (+/-)	0.1 %	
• Resistance thermometer, relative to input range, (+/-)		0.008 %; 0.018 ... 0.008%
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
<b>Ex(i) characteristics</b>		
Module for Ex(i) protection	Yes	Yes
<b>maximum values for connecting terminals for gas group IIC</b>		
• U <sub>o</sub> (no-load voltage), max.	25.2 V	5.9 V
• I <sub>o</sub> (short-circuit current), max.	68.5 mA	28.8 mA
• P <sub>o</sub> (power output), max.	431 mW	41.4 mW
• C <sub>o</sub> (permissible external capacity), max.	90 nF	43 µF
• L <sub>o</sub> (permissible external inductivity), max.	7.5 mH	40 mH
<b>Standards, approvals, certificates</b>		
<b>Use in hazardous areas</b>		
• Test number PTB	Ex-96.D.2092X	Ex-96.D.2108X
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• max.	60 °C	60 °C
<b>Connection method</b>		
required front connector	20-pin	20-pin
<b>Dimensions</b>		
Width	40 mm	
Height	125 mm	
Depth	120 mm	
<b>Weights</b>		
Weight, approx.	290 g	210 g

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**Overview**

- Analog outputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 4 analog outputs in 4 channel modules (single-channel isolation)
- Diagnostics and diagnostics alarm programmable

**Ordering data****Article No.**

<b>Ex analog output module</b> 4 outputs, isolated, 0/4 to 20 mA	<b>6ES7332-5RD00-0AB0</b>
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b>
<b>Front door, elevated design</b> e.g. for 32 channel modules; enables connection of 1.3 mm <sup>2</sup> /16 AWG wires	<b>6ES7328-0AA00-7AA0</b>
<b>LK 393 cable guide</b> Mandatory for operation in hazardous areas	<b>6ES7393-4AA00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part), for modules with 20-pin front connector	<b>6ES7392-2XX00-0AA0</b>
<b>Label cover</b> 10 units (spare part), for modules with 20-pin front connector	<b>6ES7392-2XY00-0AA0</b>
<b>Labeling sheets for machine inscription</b> For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units  Petrol Light beige Yellow Red	<b>6ES7392-2AX00-0AA0</b> <b>6ES7392-2BX00-0AA0</b> <b>6ES7392-2CX00-0AA0</b> <b>6ES7392-2DX00-0AA0</b>

**Article No.**

<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>

# SIMATIC S7-300 Advanced Controllers

I/O modules

Ex analog modules

## Ex analog output modules

### Technical specifications

Article number	<b>6ES7332-5RD00-0AB0</b> SIMATIC S7, SM 332 ANALOG OUTPUT
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	200 mA
from backplane bus 5 V DC, max.	80 mA
<b>Power loss</b>	
Power loss, typ.	4 W
<b>Analog outputs</b>	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	70 mA
Current output, no-load voltage, max.	14 V
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Load impedance (in rated range of output)</b>	
• with current outputs, max.	500 Ω
<b>Cable length</b>	
• shielded, max.	200 m
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
• Current, relative to output range, (+/-)	0.55 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to output range, (+/-)	0.2 %

Article number	<b>6ES7332-5RD00-0AB0</b> SIMATIC S7, SM 332 ANALOG OUTPUT
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Ex(i) characteristics</b>	
Module for Ex(i) protection	Yes
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>o</sub> (no-load voltage), max.	14 V
• I <sub>o</sub> (short-circuit current), max.	70 mA
• P <sub>o</sub> (power output), max.	440 mW
• L <sub>o</sub> (permissible external inductivity), max.	6.6 mH
<b>Standards, approvals, certificates</b>	
<b>Use in hazardous areas</b>	
• Test number PTB	Ex-96.D.2026X
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• max.	60 °C
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	280 g

5

**Overview**

- Analog inputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 4 analog inputs in 4 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Programmable diagnostics and diagnostic interrupt
- Programmable threshold alarm
- HART-compatible inputs (6AG1 331-7RD00-2AB0 only)

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Ordering data****SIPLUS S7-300  
Ex analog input modules**

Extended temperature range and exposure to media

4 inputs, isolated, 0/4 to 20 mA, 15 bit

Exposure to media

8/4 inputs, isolated, for thermocouples and Pt100, Pt200, Ni100; medial exposure only

**Accessories**

*Mandatory*

**Front connector**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

*Consumables*

**DIN rail for active bus modules**

For max. 5 active bus modules for hot swapping function

- Length 483 mm (19")
- Length 530 mm
- Length 620 mm
- Length 2000 mm

**Front door, elevated design**

E.g. for 32-channel modules; for connecting 1.3 mm<sup>2</sup>/16 AWG conductors; circuit diagram and nameplates in petrol

**LK 393 cable guide**

Mandatory for operation in hazardous areas

**Article No.**

**6AG1331-7RD00-2AB0**

**6AG1331-7SF00-4AB0**

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0**  
**6ES7195-1GG30-0XA0**  
**6ES7195-1GC00-0XA0**

**6ES7328-0AA00-7AA0**

**6ES7393-4AA00-0AA0**

**Article No.****Labeling strips**

10 units (spare part), for modules with 20-pin front connector

**Label cover**

10 units (spare part), for modules with 20-pin front connector

**Labeling sheets  
for machine inscription**

For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

Petrol

**6ES7392-2AX00-0AA0**

Light beige

**6ES7392-2BX00-0AA0**

Yellow

**6ES7392-2CX00-0AA0**

Red

**6ES7392-2DX00-0AA0**

*Documentation*

**SIMATIC Manual Collection**

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection  
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**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 Ex analog modules

**SIPLUS S7-300 Ex analog input modules****Technical specifications**

Article number	<b>6AG1331-7RD00-2AB0</b>	<b>6AG1331-7SF00-4AB0</b>
Based on	<b>6ES7331-7RD00-0AB0</b> SIPLUS S7-300 SM331 4AE	<b>6ES7331-7SF00-0AB0</b> SIPLUS S7-300 SM331 20-pin
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	0 °C; = Tmin
• max.	60 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use, 70 °C only 4 wire	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

5

## Overview



- One-channel intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 specifiable comparison values
- Integrated digital outputs to output the response upon reaching the comparison value.
- Operating modes:
  - Continuous counting
  - One-shot counting
  - Periodic counting
- Special functions:
  - Set counter
  - Latch counter
- Start/stop counter with gate function

Note:

Incremental encoders and pre-assembled connecting cables for counting and positioning functions are offered under SIMODRIVE Sensor or Motion Connect 500.

<http://www.siemens.com/simatic-technology>

## Ordering data

Ordering data	Article No.
<b>FM 350-1 counter module</b> With 1 channel, max. 500 kHz; for incremental encoder	<b>6ES7350-1AH03-0AE0</b>
<b>Coding plug - Range card for analog inputs</b> Spare part	<b>6ES7974-0AA00-0AA0</b>
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b>
20-pin, with spring-loaded contacts • 1 unit • 100 units	<b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>
<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX00-0AA0</b>
<b>Labeling sheets for machine inscription</b>	See under "Accessories", page 5/257
<b>Slot number label</b> Spare part	<b>6ES7912-0AA00-0AA0</b>
<b>Shield connection element</b> 80 mm wide, with 2 rows for 4 terminals each	<b>6ES7390-5AA00-0AA0</b>
<b>Shield connection clamps</b> 2 units For 2 cables, diameter 2 mm to 6 mm	<b>6ES7390-5AB00-0AA0</b>
For 1 cable, diameter 3 mm to 8 mm	<b>6ES7390-5BA00-0AA0</b>
For 1 cable, diameter 4 mm to 13 mm	<b>6ES7390-5CA00-0AA0</b>
<b>Connectable incremental encoders 6FX2 001-2...</b>	Refer to the Industry Mall under SIMODRIVE Sensor or Motion Connect 500 (see also <a href="http://www.siemens.com/simatic-technology">http://www.siemens.com/simatic-technology</a> )

**Signal cable**

Pre-assembled  
for HTL and TTL encoder, without  
D-sub connector, UL/DESINA

Length code:

0 m  
100 m  
200 m

0 m  
10 m  
20 m  
30 m  
40 m  
50 m  
60 m  
70 m  
80 m  
90 m

0 m  
1 m  
2 m  
3 m  
4 m  
5 m  
6 m  
7 m  
8 m  
9 m

**Article No.**

**6FX5002-2CA12-** ■ ■ ■ 0

1  
2  
3

A  
B  
C  
D  
E  
F  
G  
H  
J  
K

A  
B  
C  
D  
E  
F  
G  
H  
J  
K

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 350-1 counter module

### Technical specifications

Article number	<b>6ES7350-1AH03-0AE0</b> FM350-1, counter mod. up to 500KHZ
<b>Supply voltage</b>	
<b>Auxiliary voltage 1L+, load voltage 2L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage 1L+ (without load), max.	40 mA
from backplane bus 5 V DC, max.	160 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes; 5.2 V $\pm$ 2 %
• Output current, max.	300 mA
<b>24 V encoder supply</b>	
• 24 V	Yes; 1L+ (-3 V)
• Output current, max.	400 mA
<b>Power loss</b>	
Power loss, typ.	4.5 W
<b>Digital inputs</b>	
Number of digital inputs	3
Functions	1 for gate start, 1 for gate stop, 1 for setting the counter
<b>Input voltage</b>	
• for signal "0"	-28.8 ... +5V
• for signal "1"	+11 to +28.8V
<b>Input current</b>	
• for signal "1", typ.	9 mA
<b>Digital outputs</b>	
Number of digital outputs	2
Short-circuit protection	Yes; Clocked electronically
<b>Output voltage</b>	
• for signal "0", max.	3 V
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	0.6 A

Article number	<b>6ES7350-1AH03-0AE0</b> FM350-1, counter mod. up to 500KHZ
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes; With 2 pulse trains offset by 90°
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes; 1 pulse train, 1 direction level
<b>Counter</b>	
Number of counter inputs	1; 32 bit or $\pm$ 31 bit
<b>Counter input 5 V</b>	
• Terminating resistor	220 $\Omega$
• Counting frequency, max.	500 kHz
<b>Counter input 24 V</b>	
• Input voltage for signal "0"	-28.8 ... +5V
• Input voltage for signal "1"	+11 to +28.8V
• Input current for signal "1", typ.	9 mA
• Counting frequency, max.	200 kHz
• Minimum pulse width	2.5 $\mu$ s
<b>Connection method</b>	
required front connector	1x 20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	250 g

5



## Overview



- 8-channel intelligent counter module for universal counting and measuring
- To directly connect 24 V incremental encoders, direction sensors, initiators or NAMUR encoders
- Check function with preselectable set points (number depends on mode)
- Integrated digital outputs to output the response when the setpoint is reached
- Operating modes:
  - Continuous/single/periodic counting
  - Frequency/speed measurement
  - Cycle duration measurement
  - Dosing

Note:

Incremental encoder and pre-assembled connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

<http://www.siemens.com/simatic-technology>

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>FM 350-2 counter module</b> With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; incl. configuration package and electronic documentation on CD	<b>6ES7350-2AH01-0AE0</b>	<b>Shield connection element</b> 80 mm wide, with 2 rows for 4 terminals each	<b>6ES7390-5AA00-0AA0</b>
<b>Front connector</b> 40-pin, with screw contacts <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul> 40-pin, with spring-loaded contacts <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul>	<b>6ES7392-1AM00-0AA0</b> <b>6ES7392-1AM00-1AB0</b> <b>6ES7392-1BM01-0AA0</b> <b>6ES7392-1BM01-1AB0</b>	<b>Terminal elements</b> 2 units For 2 cables with 2 mm to 6 mm diameter For 1 cable with 3 mm to 8 mm diameter For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5AB00-0AA0</b> <b>6ES7390-5BA00-0AA0</b> <b>6ES7390-5CA00-0AA0</b>
<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>	<b>Signal cable</b> Pre-assembled for HTL and TTL encoder, without sub D connector, UL/DESINA Length code:	<b>6FX5002-2CA12- ■ ■ ■ 0</b>  See FM 350-1, page 5/135
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX10-0AA0</b>		
<b>Labeling sheets for machine inscription</b>	See under "Accessories", page 5/257		
<b>Slot number label</b> Spare part	<b>6ES7912-0AA00-0AA0</b>		

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 350-2 counter module

### Technical specifications

Article number	<b>6ES7350-2AH01-0AE0</b> FM350-2, Counter Mod., 8 Channels, 20KHz
<b>Supply voltage</b>	
<b>Auxiliary voltage 1L+, load voltage 2L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	150 mA
from backplane bus 5 V DC, max.	100 mA
<b>NAMUR encoder supply</b>	
• 8.2 V	Yes
• Short-circuit protection	Yes
• Output current, max.	200 mA
<b>Power loss</b>	
Power loss, typ.	10 W
<b>Digital inputs</b>	
Number of digital inputs	8
Number of NAMUR inputs	8
Functions	1 each for gate start/ gate stop
<b>Input voltage</b>	
• for signal "0"	-3 to +5V
• for signal "1"	11 to 30.2 V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
<b>Input delay (for rated value of input voltage)</b>	
• Input frequency, max.	20 kHz
<b>for standard inputs</b>	
- at "0" to "1", max.	50 µs
<b>for NAMUR inputs</b>	
- at "0" to "1", max.	50 µs
<b>Cable length</b>	
• shielded, max.	100 m
<b>Digital outputs</b>	
Number of digital outputs	8
Short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-40 V)
<b>Output voltage</b>	
• for signal "1", min.	L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
<b>Switching frequency</b>	
• with resistive load, max.	500 Hz
• with inductive load, max.	0.5 Hz
<b>Total current of the outputs (per group)</b>	
<b>horizontal installation</b>	
- up to 40 °C, max.	4 A
- up to 60 °C, max.	2 A
<b>all other mounting positions</b>	
- up to 40 °C, max.	2 A
<b>Cable length</b>	
• shielded, max.	600 m

Article number	<b>6ES7350-2AH01-0AE0</b> FM350-2, Counter Mod., 8 Channels, 20KHz
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes
• NAMUR encoder	Yes; to DIN 19 234
• 2-wire sensor	Yes
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes; Diagnostic information readable
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
<b>Counter</b>	
Number of counter inputs	8; 32 bit or ±31 bit
<b>Counter input 24 V</b>	
• Input voltage for signal "0"	-3 to +5V
• Input voltage for signal "1"	11 to 30.2 V
• Input current for signal "1", typ.	9 mA
• Counting frequency, max.	20 kHz; Incremental encoder: 10 kHz
<b>Connection method</b>	
required front connector	1x 40-pin
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	460 g

## Overview



- Two-channel positioning module for rapid-traverse/creep-speed drives
- 4 digital outputs per channel for motor control
- Incremental or synchro-serial position decoding

## Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

<http://www.siemens.com/simatic-technology>

## Ordering data

## Article No.

## Signal cables

Preassembled for SSI absolute encoder, UL/DESINA

6FX50 2-2CC11-

Preassembled for TTL encoder 6FX2001-1, UL/DESINA

6FX50 2-2CD01-

Preassembled for TTL encoder 24 V, UL/DESINA

6FX50 2-2CD24-

Not crimped

0

Module end crimped, connector case supplied

1

Motor end crimped, connector case supplied

4

0 m

1

100 m

2

200 m

3

0 m

A

10 m

B

20 m

C

30 m

D

40 m

E

50 m

F

60 m

G

70 m

H

80 m

J

90 m

K

0 m

A

1 m

B

2 m

C

3 m

D

4 m

E

5 m

F

6 m

G

7 m

H

8 m

J

9 m

K

0.0 m

0

0.1 m

1

0.2 m

2

0.3 m

3

0.4 m

4

0.5 m

5

0.6 m

6

0.7 m

7

0.8 m

8

## Ordering data

## Article No.

## FM 351 positioning module

6ES7351-1AH02-0AE0

For rapid traverse and creep speed drives

## Front connectors

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0  
6ES7392-1AJ00-1AB0

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BJ00-0AA0  
6ES7392-1BJ00-1AB0

## Bus connectors

6ES7390-0AA00-0AA0

1 unit (spare part)

## Labeling strips

6ES7392-2XX00-0AA0

10 units (spare part)

## Slot number label

6ES7912-0AA00-0AA0

## Labeling sheets for machine inscription

See under "Accessories", page 5/257

Spare part

## Shield connection element

6ES7390-5AA00-0AA0

80 mm wide, with 2 rows for 4 terminals each

## Shield connection clamp

2 units

For 2 cables with 2 mm to 6 mm diameter

6ES7390-5AB00-0AA0

For 1 cable with 3 mm to 8 mm diameter

6ES7390-5BA00-0AA0

For 1 cable with 4 mm to 13 mm diameter

6ES7390-5CA00-0AA0

## SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 351 positioning module

## Technical specifications

Article number	<b>6ES7351-1AH02-0AE0</b> FM351 positioning Mod. rapid/creep Feed
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
Current consumption, max.	350 mA
from backplane bus 5 V DC, max.	150 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	350 mA
• Cable length, max.	32 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	400 mA; Per channel
• Cable length, max.	100 m
<b>Power loss</b>	
Power loss, typ.	7.9 W
<b>Digital inputs</b>	
Number of digital inputs	8
Functions	Reference cams, reversing cams, flying actual value setting, start/stop positioning
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA
<b>Digital outputs</b>	
Number of digital outputs	8
Functions	Rapid traverse, creep, run right, run left
Short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0.8 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA

Article number	<b>6ES7351-1AH02-0AE0</b> FM351 positioning Mod. rapid/creep Feed
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA; on signal "0", max. 2 mA; on signal "1", max. 6 mA
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input voltage	5 V difference signal (phys. RS 422)
• Input frequency, max.	0.5 MHz
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Trace mark signals	A, B
• Zero mark signal	N
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length, parameterizable	13 or 25 bit
• Clock frequency, max.	1.5 MHz
• Gray code	Yes
• Cable length, shielded, max.	200 m; At max. 188 kHz
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Connection method</b>	
required front connector	1x 20-pin
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	550 g

## Overview



- Extremely high-speed electronic cam controller
- Low-cost alternative to mechanical cam controllers
- 32 cam tracks, 13 onboard digital outputs for direct output of actions
- Incremental or synchro-serial position decoding

## Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

<http://www.siemens.com/simatic-technology>

## Ordering data

Ordering data	Article No.
<b>FM352 electronic cam controller</b>	<b>6ES7352-1AH02-0AE0</b>
<b>Front connectors</b>	
20-pin, with screw contacts	
• 1 unit	<b>6ES7392-1AJ00-0AA0</b>
• 100 units	<b>6ES7392-1AJ00-1AB0</b>
20-pin, with spring-loaded contacts	
• 1 unit	<b>6ES7392-1BJ00-0AA0</b>
• 100 units	<b>6ES7392-1BJ00-1AB0</b>
<b>Bus connectors</b>	<b>6ES7390-0AA00-0AA0</b>
1 unit (spare part)	
<b>Labeling strips</b>	<b>6ES7392-2XX00-0AA0</b>
10 units (spare part)	
<b>Labeling sheets for machine inscription</b>	See under "Accessories", page 5/257
<b>Slot number label</b>	<b>6ES7912-0AA00-0AA0</b>
Spare part	
<b>Shield connection element</b>	<b>6ES7390-5AA00-0AA0</b>
80 mm wide, with 2 rows for 4 terminals each	
<b>Shield connection clamps</b>	
2 units	
For 2 cables with 2 mm to 6 mm diameter	<b>6ES7390-5AB00-0AA0</b>
For 1 cable with 3 mm to 8 mm diameter	<b>6ES7390-5BA00-0AA0</b>
For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5CA00-0AA0</b>

## Ordering data

## Article No.

## Signal cable

Pre-assembled for SSI absolute encoder, UL/DESINA

**6FX50** ■ **2-2CC11-** ■ ■ ■ ■ ■

Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA

**6FX50** ■ **2-2CD01-** ■ ■ ■ ■ ■

Pre-assembled for TTL encoder 24 V, UL/DESINA

**6FX50** ■ **2-2CD24-** ■ ■ ■ ■ ■

Not crimped

**0**

Module end crimped, connector case supplied

**1**

Motor end crimped, connector case supplied

**4**

0 m

**1**

100 m

**2**

200 m

**3**

0 m

**A**

10 m

**B**

20 m

**C**

30 m

**D**

40 m

**E**

50 m

**F**

60 m

**G**

70 m

**H**

80 m

**J**

90 m

**K**

0 m

**A**

1 m

**B**

2 m

**C**

3 m

**D**

4 m

**E**

5 m

**F**

6 m

**G**

7 m

**H**

8 m

**J**

9 m

**K**

0.0 m

**0**

0.1 m

**1**

0.2 m

**2**

0.3 m

**3**

0.4 m

**4**

0.5 m

**5**

0.6 m

**6**

0.7 m

**7**

0.8 m

**8**

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 352 cam controller

### Technical specifications

Article number	<b>6ES7352-1AH02-0AE0</b> FM352 Electron. Cam-operated Control
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	200 mA
from backplane bus 5 V DC, max.	100 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	300 mA
• Cable length, max.	32 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
<b>Power loss</b>	
Power loss, typ.	8.1 W
<b>Digital inputs</b>	
Number of digital inputs	4
Functions	Reference point switch, set floating actual value/length measurement, brake release, enable track output no. 3
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal *0*	-30 to +5 V
• for signal *1*	+11 to +30V
<b>Input current</b>	
• for signal *0*, max. (permissible quiescent current)	2 mA
• for signal *1*, typ.	9 mA
<b>Digital outputs</b>	
Number of digital outputs	13
Functions	Cam track
Short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal *1*, min.	UP - 0.8 V
<b>Output current</b>	
• for signal *1* permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal *1* permissible range for 0 to 60 °C, max.	600 mA; with UPmax
• for signal *0* residual current, max.	0.5 mA

Article number	<b>6ES7352-1AH02-0AE0</b> FM352 Electron. Cam-operated Control
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input voltage	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Trace mark signals	A, B
• Zero mark signal	N
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
<b>Encoder signals, absolute encoder (SSI)</b>	
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length, parameterizable	13 or 25 bit
• Clock frequency, max.	1 MHz
• Gray code	Yes
• Cable length, shielded, max.	320 m; at max. 125 kHz
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Connection method</b>	
required front connector	1x 20-pin
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	550 g

5

## Overview



- The FM 352-5 high-speed Boolean processor provides extremely fast binary control and also some of the fastest switching processes ever possible (cycle time: 1 µs).
- Programming is possible with LAD or FBD.
- The available set of statements comprises bit statements (partial statement set of STEP 7), timers, counters, frequency dividers, frequency generators, shift registers.
- 12 integral DI / 8 integral DO.
- 2 versions: sinking or sourcing digital outputs.
- 1 channel for connection of a 24-V incremental encoder, a 5-V incremental encoder (RS 422) or an SSI absolute encoder.

Micro Memory Card required for use of the FM 352-5

Note:

Displacement measuring systems and precut/pre-assembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

<http://www.siemens.com/simatic-technology>

## Ordering data

## Article No.

**FM 352-5 high-speed Boolean processor**

with sinking digital outputs

6ES7352-5AH01-0AE0

with sourcing digital outputs

6ES7352-5AH11-0AE0

**Micro Memory Card**

128 KB

6ES7953-8LG31-0AA0

512 KB

6ES7953-8LJ31-0AA0

2 MB

6ES7953-8LL31-0AA0

**Front connector**

40-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AM00-0AA0

6ES7392-1AM00-1AB0

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BM01-0AA0

6ES7392-1BM01-1AB0

**Signal cables**

To HTL and TTL encoders, preassembled, without Sub-D connector

6FX5002-2CA12-

0

To SSI absolute encoders 6FX2 001-5, preassembled, without Sub-D connector

6FX5002-2CC12-

0

Length code:

0 m

1

100 m

2

200 m

3

0 m

A

10 m

B

20 m

C

30 m

D

40 m

E

50 m

F

60 m

G

70 m

H

80 m

J

90 m

K

0 m

A

1 m

B

2 m

C

3 m

D

4 m

E

5 m

F

6 m

G

7 m

H

8 m

J

9 m

K

0.0 m

0

0.1 m

1

0.2 m

2

0.3 m

3

0.4 m

4

0.5 m

5

0.6 m

6

0.7 m

7

0.8 m

8

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 352-5 high-speed Boolean processor

### Technical specifications

Article number	<b>6ES7352-5AH01-0AE0</b> FM 352-5, Boolean Processor 12DE/8DA	<b>6ES7352-5AH11-0AE0</b> FM 352-5 PNP, Boolean Processor 12DI/8DO
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from load voltage 1L+, max.	150 mA; typ. 60 mA	150 mA; typ. 60 mA
from load voltage 2L+ (without load), max.	200 mA; typ. 60 mA, DI/DO supply	200 mA; typ. 60 mA, DI/DO supply
from load voltage 3L+ (with encoder), max.	600 mA; typ. 80 mA plus encoder supply	600 mA; typ. 80 mA plus encoder supply
from load voltage 3L+ (without load), max.	200 mA; typ. 80 mA	200 mA; typ. 80 mA
from backplane bus 5 V DC, typ.	135 mA	135 mA
<b>Encoder supply</b>		
<b>5 V encoder supply</b>		
• 5 V	Yes	Yes
• Short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	250 mA	250 mA
<b>24 V encoder supply</b>		
• 24 V	Yes	Yes
• Short-circuit protection	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage
• Output current, max.	400 mA	400 mA
<b>Power loss</b>		
Power loss, typ.	6.5 W	6.5 W
<b>Memory</b>		
Type of memory	RAM	RAM
Memory size	128 kbyte; required for operation, MMC	128 kbyte; required for operation, MMC
<b>Digital inputs</b>		
Number of digital inputs	8; Standard and up to 12 with 24 V DC encoder inputs as digital inputs	8; Standard and up to 12 with 24 V DC encoder inputs as digital inputs
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA
• for signal "1", typ.	3.8 mA	3.8 mA
<b>Input delay (for rated value of input voltage)</b>		
• Input frequency (with a time delay of 0.1 ms), max.	200 kHz	200 kHz
• programmable digital filter delay	None, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms	None, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms
<b>for standard inputs</b>		
- at "0" to "1", max.	3 µs; typ. 1.5 µs	3 µs; typ. 1.5 µs
<b>Cable length</b>		
• shielded, max.	600 m	600 m

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**Technical specifications**

Article number	<b>6ES7352-5AH01-0AE0</b> FM 352-5, Boolean Processor 12DE/8DA	<b>6ES7352-5AH11-0AE0</b> FM 352-5 PNP, Boolean Processor 12DI/8DO
<b>Digital outputs</b>		
Number of digital outputs	8	8
Current-sinking	Yes	No
Current-sourcing	No	Yes
Short-circuit protection	Yes; Overvoltage protection, thermal protection	Yes; Overvoltage protection, thermal protection
Limitation of inductive shutdown voltage to	2M -45 V typ., (-40 V to -55 V); comment: no protection against inductive kickback >55 mJ	2M -45 V typ., (-40 V to -55 V); comment: no protection against inductive kickback >55 mJ
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	5 W
<b>Output voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal *0*, max.	28.8 V	28.8 V
• for signal *1*, max.	0.5 V	0.5 V
<b>Output current</b>		
• for signal *1* rated value	0.5 A; At 60 °C	0.5 A; At 60 °C
• for signal *1* permissible range for 0 to 60 °C, min.	5 mA	5 mA
• for signal *1* permissible range for 0 to 60 °C, max.	600 mA	600 mA
• for signal *0* residual current, max.	1 mA	1 mA
<b>Switching frequency</b>		
• with resistive load, max.	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A
• with inductive load, max.	2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes	2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes
• on lamp load, max.	10 Hz	10 Hz
<b>Cable length</b>		
• shielded, max.	600 m	600 m
<b>Encoder</b>		
<b>Connectable encoders</b>		
• Incremental encoder (symmetrical)	Yes	Yes
• Incremental encoder (asymmetrical)	Yes	Yes
• Absolute encoder (SSI)	Yes	Yes
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>Encoder signals, incremental encoder (symmetrical)</b>		
• Trace mark signals	A, notA, B, notB	A, notA, B, notB
• Zero mark signal	N, notN	N, notN
• Input voltage	5 V difference signal (phys. RS 422)	5 V difference signal (phys. RS 422)
• Input frequency, max.	500 kHz	500 kHz
• Cable length, shielded, max.	100 m; 100 m with 24 V supply and 500 kHz; 32 m with 5 V supply and 500 kHz	100 m; 100 m with 24 V supply and 500 kHz; 32 m with 5 V supply and 500 kHz
<b>Encoder signals, incremental encoder (asymmetrical)</b>		
• Trace mark signals	A, B	A, B
• Zero mark signal	N	N
• Input frequency, max.	200 kHz	200 kHz
• Cable length, shielded, max.	50 m; Cable length, HTL incremental encoder, Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.	50 m; Cable length, HTL incremental encoder, Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 352-5 high-speed Boolean processor

### Technical specifications

Article number	<b>6ES7352-5AH01-0AE0</b> FM 352-5, Boolean Processor 12DE/8DA	<b>6ES7352-5AH11-0AE0</b> FM 352-5 PNP, Boolean Processor 12DI/8DO
<b>Encoder signals, absolute encoder (SSI)</b>		
• Data signal	DATA, notDATA	DATA, notDATA
• Clock signal	CK, notCK	CK, notCK
• Telegram length, parameterizable	13 or 25 bit	13 or 25 bit
• Clock frequency, max.	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz
• Cable length, shielded, max.	320 m; At 125 kHz	320 m; At 125 kHz
• Monoflop time	settable: 16/32/48/64 µs	settable: 16/32/48/64 µs
• Listening mode	Yes; one or two stations	Yes; one or two stations
• Multiturn	Yes; 25 bit message frame	Yes; 25 bit message frame
<b>Encoder signal evaluation</b>		
• Counting direction, forward	Yes	Yes
• Counting direction, backward	Yes	Yes
<b>Response times</b>		
Input- to output response time	5 V input to 24 V output, 0 filter: 1 to 4 µs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 µs (typ.)	5 V input to 24 V output, 0 filter: 1 to 4 µs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 µs (typ.)
<b>Interfaces</b>		
<b>Point-to-point connection</b>		
• Updating times	PLC interface: 1.7 ms	PLC interface: 1.7 ms
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization error; SSI message frame overflow	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization error; SSI message frame overflow
• Hardware interrupt	Yes; 8 available; for generation by user program	Yes; 8 available; for generation by user program
<b>Counter</b>		
Counting range, description	Counting range (16-bit counters): -32 768 to 32 767 (user-specific within this range); counting range (32-bit counters): -2 147 483 648 to 2 147 483 647 (user-specific within this range)	Counting range (16-bit counters): -32 768 to 32 767 (user-specific within this range); counting range (32-bit counters): -2 147 483 648 to 2 147 483 647 (user-specific within this range)
Counting range, lower limit	-2 147 483 648	-2 147 483 648
Counting range, upper limit	2 147 483 647	2 147 483 647
<b>Counting mode</b>		
• Counting mode, individual	Yes	Yes
• Counting mode, continuous	Yes	Yes
• Counting mode, periodic	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	0 °C	0 °C
• max.	60 °C	60 °C
<b>Configuration</b>		
<b>Programming</b>		
• Program cycle time (scan)	1 µs	1 µs
<b>Connection method</b>		
required front connector	1x 40-pin	1x 40-pin
<b>Dimensions</b>		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)

## Overview



- 4-channel closed-loop controller module for universal control tasks
- Can be used for temperature, pressure, flow and level controls
- Convenient online self-optimization for temperature controls
- Predefined controller structures
- 2 control algorithms
- 2 versions:
  - FM 355 C as continuous controller;
  - FM 355 S as step or pulse controller
- With 4 analog outputs (FM 355 C) or 8 digital outputs (FM 355 S) for direct control of the most common actuators
- Continuation of control mode also possible with CPU stop or failure

## Ordering data

## Article No.

**FM 355 C controller module** **6ES7355-0VH10-0AE0**

With 4 analog outputs for  
4 continuous controllers

**FM 355 S controller module** **6ES7355-1VH10-0AE0**

With 8 digital outputs for 4 step or  
pulse controllers

**Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

**Bus connectors**

1 unit (spare part)

**6ES7390-0AA00-0AA0**

**Labeling strips**

10 units (spare part)

**6ES7392-2XX00-0AA0**

**Labeling sheets for machine inscription**

See under "Accessories",  
page 5/257

**Slot number label**

Spare part

**6ES7912-0AA00-0AA0**

**Shield connection element**

80 mm wide,  
with 2 rows for 4 terminals each

**6ES7390-5AA00-0AA0**

**Shield connection clamps**

2 units

For 2 cables  
with 2 mm to 6 mm diameter

**6ES7390-5AB00-0AA0**

For 1 cable  
with 3 mm to 8 mm diameter

**6ES7390-5BA00-0AA0**

For 1 cable  
with 4 mm to 13 mm diameter

**6ES7390-5CA00-0AA0**

## Technical specifications

Article number	<b>6ES7355-0VH10-0AE0</b> Control unit FM355C, 4 chan.	<b>6ES7355-1VH10-0AE0</b> Control unit FM355S, 4 chan.
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from load voltage L+ (without load), max.	310 mA; Typ. 260 mA	270 mA; typ. 220 mA
from backplane bus 5 V DC, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
<b>Power loss</b>		
Power loss, typ.	6.5 W	5.5 W
<b>Digital inputs</b>		
Number of digital inputs	8	8
Input characteristic curve in accordance with IEC 61131, type 2	Yes	Yes
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
<b>Input current</b>		
• for signal "1", typ.	7 mA	7 mA
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 355 controller module

### Technical specifications

Article number	6ES7355-0VH10-0AE0	6ES7355-1VH10-0AE0
	Control unit FM355C, 4 chan.	Control unit FM355S, 4 chan.
<b>Digital outputs</b>		
Number of digital outputs		8
Short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
<b>Switching capacity of the outputs</b>		
• on lamp load, max.		5 W
<b>Load resistance range</b>		
• lower limit		240 Ω
• upper limit		4 kΩ
<b>Output voltage</b>		
• for signal *1*, min.		L+ (-2.5 V)
<b>Output current</b>		
• for signal *1* rated value		100 mA
• for signal *1* permissible range for 0 to 60 °C, min.		5 mA
• for signal *1* permissible range for 0 to 60 °C, max.		150 mA
• for signal *0* residual current, max.		0.5 mA
<b>Switching frequency</b>		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
<b>Total current of the outputs (per group)</b>		
<b>all mounting positions</b>		
- up to 60 °C, max.		400 mA
<b>Cable length</b>		
• shielded, max.		1 000 m
<b>Analog inputs</b>		
Number of analog inputs	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	Yes
• -1.75 V to +11.75 V	Yes	Yes
• -80 mV to +80 mV	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 mA to +23.5 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
<b>Input ranges (rated values), thermocouples</b>		
• Type B	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
<b>Input ranges (rated values), resistance thermometer</b>		
• Pt 100	Yes	Yes

## Technical specifications

Article number	6ES7355-0VH10-0AE0	6ES7355-1VH10-0AE0
	Control unit FM355C, 4 chan.	Control unit FM355S, 4 chan.
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- internal temperature compensation	Yes	Yes
- external temperature compensation with Pt100	Yes	Yes
<b>Characteristic linearization</b>		
• parameterizable	Yes	Yes
- for thermocouples	Type B, J, K, R, S	Type B, J, K, R, S
- for resistance thermometer	Pt100 (standard)	Pt100 (standard)
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples
<b>Analog outputs</b>		
Number of analog outputs	4	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	
• -10 V to +10 V	Yes	
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Connection of actuators</b>		
• for voltage output two-wire connection	Yes	
• for current output two-wire connection	Yes	
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 k $\Omega$	
• with voltage outputs, capacitive load, max.	1 $\mu$ F	
• with current outputs, max.	500 $\Omega$	
• with current outputs, inductive load, max.	1 mH	
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	
<b>Analog value generation for the inputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	14 bit; 12 bit or 14 bit, parameterizable	14 bit; 12 bit or 14 bit, parameterizable
<b>Analog value generation for the outputs</b>		
<b>Settling time</b>		
• for resistive load	0.1 ms	
• for capacitive load	3.3 ms	
• for inductive load	0.5 ms	

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 355 controller module

### Technical specifications

Article number	6ES7355-0VH10-0AE0	6ES7355-1VH10-0AE0
	Control unit FM355C, 4 chan.	Control unit FM355S, 4 chan.
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>Errors/accuracies</b>		
<b>Operational error limit in overall temperature range</b>		
• Voltage, relative to input range, (+/-)	0.6 %; $\pm 0.6$ to $\pm 1\%$	0.6 %; $\pm 0.6$ to $\pm 1\%$
• Current, relative to input range, (+/-)	0.6 %; $\pm 0.6$ to $\pm 1\%$	0.6 %; $\pm 0.6$ to $\pm 1\%$
• Resistance thermometer, relative to input range, (+/-)	0.6 %; $\pm 0.6$ to $\pm 1\%$	0.6 %; $\pm 0.6$ to $\pm 1\%$
• Voltage, relative to output range, (+/-)	0.5 %	
• Current, relative to output range, (+/-)	0.6 %	
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input range, (+/-)	0.4 %; 80 mV: $\pm 0.6$ %; 250 to 1 000 mV: $\pm 0.4$ %; 2.5 to 10 V: $\pm 0.6$ %; 3.2 to 20 mA: $\pm 0.5$ %	0.4 %; 80 mV: $\pm 0.6$ %; 250 to 1 000 mV: $\pm 0.4$ %; 2.5 to 10 V: $\pm 0.6$ %; 3.2 to 20 mA: $\pm 0.5$ %
• Current, relative to input range, (+/-)	0.4 %; $\pm 0.4$ to $\pm 0.6$ %	0.4 %; $\pm 0.4$ to $\pm 0.6$ %
• Resistance thermometer, relative to input range, (+/-)	0.4 %; $\pm 0.4$ to $\pm 0.6$ %	0.4 %; $\pm 0.4$ to $\pm 0.6$ %
• Voltage, relative to output range, (+/-)	0.3 %	
• Current, relative to output range, (+/-)	0.5 %	
<b>Interrupts/diagnostics/status information</b>		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
<b>Integrated Functions</b>		
<b>Control technology</b>		
• Number of closed-loop controllers	4	4
<b>Connection method</b>		
required front connector	2x 20-pin	2x 20-pin
<b>Dimensions</b>		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	470 g	470 g

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## Overview



- 4-channel closed-loop controller module specifically for temperature controls
- Including integrated and easy-to-use online self-optimization
- Heating and cooling controllers as well as combined controllers with heating and active cooling function feasible
- Ready-to-use controller structures
- 2 versions:
  - FM 355-2 C as a continuous controller;
  - FM 355-2 S as step or pulse controllers
- With 4 analog outputs (FM 355-2 C) or 8 digital outputs (FM 355-2 S) to directly control the most common final control elements
- Continuation of control mode also possible with CPU stop or failure

## Ordering data

## Article No.

**FM 355-2 C temperature controller module** **6ES7355-2CH00-0AE0**

With 4 analog outputs for 4 continuous-action controllers

**FM 355-2 S temperature controller module** **6ES7355-2SH00-0AE0**

With 8 digital outputs for 4 step or pulse controllers

**Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

**Bus connectors**

**6ES7390-0AA00-0AA0**

1 unit (spare part)

**Labeling strips**

**6ES7392-2XX00-0AA0**

10 units (spare part)

**Labeling sheets for machine inscription**

See under "Accessories", page 5/257

**Slot number label**

**6ES7912-0AA00-0AA0**

Spare part

**Shield connection element**

**6ES7390-5AA00-0AA0**

80 mm wide, with 2 rows for 4 terminals each

**Shield connection clamps**

2 units

For 2 cables with 2 mm to 6 mm diameter

**6ES7390-5AB00-0AA0**

For 1 cable with 3 mm to 8 mm diameter

**6ES7390-5BA00-0AA0**

For 1 cable with 4 mm to 13 mm diameter

**6ES7390-5CA00-0AA0**

## Technical specifications

Article number	<b>6ES7355-2CH00-0AE0</b>	<b>6ES7355-2SH00-0AE0</b>
	TEMP.-Control unit FM355-2C, 4 chan.	TEMP.-Control unit FM355-2S, 4 chan.
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from load voltage L+ (without load), max.	310 mA; Typ. 260 mA	270 mA; typ. 220 mA
from backplane bus 5 V DC, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
<b>Power loss</b>		
Power loss, typ.	6.5 W	5.5 W
<b>Digital inputs</b>		
Number of digital inputs	8	8
Input characteristic curve in accordance with IEC 61131, type 2	Yes	Yes
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
<b>Input current</b>		
• for signal "1", typ.	7 mA	7 mA
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## FM 355-2 temperature controller module

### Technical specifications

Article number	6ES7355-2CH00-0AE0	6ES7355-2SH00-0AE0
	TEMP.-Control unit FM355-2C, 4 chan.	TEMP.-Control unit FM355-2S, 4 chan.
<b>Digital outputs</b>		
Number of digital outputs		8
Short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
<b>Switching capacity of the outputs</b>		
• on lamp load, max.		5 W
<b>Load resistance range</b>		
• lower limit		240 Ω
• upper limit		4 kΩ
<b>Output voltage</b>		
• for signal *1*, min.		L+ (-2.5 V)
<b>Output current</b>		
• for signal *1* rated value		0.1 A
• for signal *1* permissible range for 0 to 60 °C, min.		5 mA
• for signal *1* permissible range for 0 to 60 °C, max.		150 mA
• for signal *0* residual current, max.		0.5 mA
<b>Switching frequency</b>		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
<b>Total current of the outputs (per group)</b>		
<b>all mounting positions</b>		
- up to 60 °C, max.		400 mA
<b>Cable length</b>		
• shielded, max.		1 000 m
<b>Analog inputs</b>		
Number of analog inputs	4	4
permissible input voltage for voltage input (destruction limit), max.	20 V	20 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	Yes
• -1.75 V to +11.75 V	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 mA to +23.5 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
<b>Input ranges (rated values), thermocouples</b>		
• Type B	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
<b>Input ranges (rated values), resistance thermometer</b>		
• Pt 100	Yes	Yes



## Technical specifications

Article number	6ES7355-2CH00-0AE0	6ES7355-2SH00-0AE0
	TEMP.-Control unit FM355-2C, 4 chan.	TEMP.-Control unit FM355-2S, 4 chan.
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- internal temperature compensation	Yes	Yes
- external temperature compensation with Pt100	Yes	Yes
<b>Characteristic linearization</b>		
• parameterizable	Yes	Yes
- for thermocouples	Type B, E, J, K, R, S	Type B, E, J, K, R, S
- for resistance thermometer	Pt100 (standard)	Pt100 (standard)
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples
<b>Analog outputs</b>		
Number of analog outputs	4	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	
• -10 V to +10 V	Yes	
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Connection of actuators</b>		
• for voltage output two-wire connection	Yes	
• for current output two-wire connection	Yes	
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 k $\Omega$	
• with voltage outputs, capacitive load, max.	1 $\mu$ F	
• with current outputs, max.	500 $\Omega$	
• with current outputs, inductive load, max.	1 mH	
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	
<b>Analog value generation for the inputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	14 bit	14 bit
<b>Analog value generation for the outputs</b>		
<b>Settling time</b>		
• for resistive load	0.1 ms	
• for capacitive load	3.3 ms	
• for inductive load	0.5 ms	
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Function modules

**FM 355-2 temperature controller module****Technical specifications**

Article number	<b>6ES7355-2CH00-0AE0</b>	<b>6ES7355-2SH00-0AE0</b>
	TEMP.-Control unit FM355-2C, 4 chan.	TEMP.-Control unit FM355-2S, 4 chan.
<b>Errors/accuracies</b>		
<b>Operational error limit in overall temperature range</b>		
• Voltage, relative to input range, (+/-)	0.6 %; ±0.6 to ±0.7 %	0.06 %; ±0.06 to ±0.7%
• Current, relative to input range, (+/-)	0.6 %; ±0.6 to ±0.7 %	0.06 %; ±0.06 to ±0.7%
• Resistance thermometer, relative to input range, (+/-)	0.6 %; ±0.6 to ±0.7 %	0.06 %; ±0.06 to ±0.7%
• Voltage, relative to output range, (+/-)	0.5 %	
• Current, relative to output range, (+/-)	0.6 %	
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input range, (+/-)	0.04 %; ±0.04 to ±0.5 %	0.04 %; ±0.04 to ±0.5 %
• Current, relative to input range, (+/-)	0.04 %; ±0.04 to ±0.5 %	0.04 %; ±0.04 to ±0.5 %
• Resistance thermometer, relative to input range, (+/-)	0.04 %; ±0.04 to ±0.5 %	0.04 %; ±0.04 to ±0.5 %
• Voltage, relative to output range, (+/-)	0.4 %	
• Current, relative to output range, (+/-)	0.5 %	
<b>Interrupts/diagnostics/status information</b>		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
<b>Integrated Functions</b>		
<b>Control technology</b>		
• Number of closed-loop controllers	4	4
<b>Connection method</b>		
required front connector	2x 20-pin	2x 20-pin
<b>Dimensions</b>		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	470 g	470 g

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## Overview



- Interface between max. 3 absolute-value sensors (SSI) and the CPU
- For provision of the displacement encoder values for further processing in STEP 7 programs
- Enables direct response of controller to encoder values in moving systems

## Note:

Displacement measuring systems and precut/preassembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

<http://www.siemens.com/simatic-technology>

## Ordering data

## Article No.

## Signal cable

Pre-assembled for SSI absolute encoder 6FX2001-5, without D-sub connector, UL/DESINA

6FX5002-2CC12-

0 m  
100 m  
200 m

1  
2  
3

0 m  
10 m  
20 m  
30 m  
40 m  
50 m  
60 m  
70 m  
80 m  
90 m

A  
B  
C  
D  
E  
F  
G  
H  
J  
K

0 m  
1 m  
2 m  
3 m  
4 m  
5 m  
6 m  
7 m  
8 m  
9 m

A  
B  
C  
D  
E  
F  
G  
H  
J  
K

0.0 m  
0.1 m  
0.2 m  
0.3 m  
0.4 m  
0.5 m  
0.6 m  
0.7 m  
0.8 m

0  
1  
2  
3  
4  
5  
6  
7  
8

## Ordering data

## Article No.

## SM 338 POS input module

6ES7338-4BC01-0AB0

For position sensing  
with 3 SSI encoders

## Front connector

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0

6ES7392-1AJ00-1AB0

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BJ00-0AA0

6ES7392-1BJ00-1AB0

## Front door, elevated design

6ES7328-0AA00-7AA0

e.g. for 32-channel modules;  
for connecting 1.3 mm<sup>2</sup>/16 AWG  
conductors

## SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD,  
multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC Distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC-based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

SIMATIC Manual Collection  
update service for 1 year

6ES7998-8XC01-8YE2

Current Manual Collection DVD and  
the three subsequent updates

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Function modules

**SM 338 POS input module****Technical specifications**

Article number	<b>6ES7338-4BC01-0AB0</b> SM 338, f. 3 SSI encoders
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	100 mA
from backplane bus 5 V DC, max.	160 mA
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• Output current, max.	900 mA
<b>Power loss</b>	
Power loss, typ.	3 W
<b>Digital inputs</b>	
<b>Input voltage</b>	
• for signal *0*	-3 to +5V
• for signal *1*	11 to 30.2 V
<b>Input current</b>	
• for signal *0*, max. (permissible quiescent current)	2 mA
• for signal *1*, typ.	9 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at *0* to *1*, min.	300 µs
<b>Cable length</b>	
• shielded, max.	600 m

Article number	<b>6ES7338-4BC01-0AB0</b> SM 338, f. 3 SSI encoders
<b>Encoder</b>	
Number of connectable encoders, max.	3
<b>Connectable encoders</b>	
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
<b>Encoder signals, absolute encoder (SSI)</b>	
• Cable length, shielded, max.	320 m; 320 m at 125 kHz; 160 m at 250 kHz; 60 m at 500 kHz; 20 m at 1 MHz
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	235 g

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**Overview**



- For connecting up to 4 drives with analog setpoint interface or pulse-direction interface to a controller
- Operation with isochronous PROFIBUS DP
- Connectable drives:
  - Electrical drives
  - Hydraulic drives
  - Stepper drives
- Can be used with:
  - SIMATIC CPU 41x-2 DP, CPU 31x-2 DP, CPU 31xT-2 DP, WinAC RTX 2008
  - SIMOTION C2xx, SIMOTION P320-4, SIMOTION D4x5-2
- Can also be used with external encoders

**Ordering data**

**Article No.**

<b>IM 174 PROFIBUS module</b>	<b>6ES7174-0AA10-0AA0</b>
PROFIBUS module for connecting analog drives and stepper drives to a controller	
<b>Setpoint cable</b>	<b>6FX2002-3AD01-</b>
for the connection between IM 174 and SIMODRIVE 611-A	
0 m	1
100 m	2
200 m	3
0 m	A
10 m	B
20 m	C
30 m	D
40 m	E
50 m	F
60 m	G
70 m	H
80 m	J
90 m	K
0 m	A
1 m	B
2 m	C
3 m	D
4 m	E
5 m	F
6 m	G
7 m	H
8 m	J
9 m	K
0.0 m	0
0.1 m	1
0.2 m	2
0.3 m	3
0.4 m	4
0.5 m	5
0.6 m	6
0.7 m	7
0.8 m	8

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Function modules

**IM 174 PROFIBUS module****Technical specifications**

Article number	<b>6ES7174-0AA10-0AA0</b> IM 174 for connecting analog Drives
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
Current consumption, max.	500 mA
from backplane bus 5 V DC, max.	100 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	1.2 A
• Cable length, max.	25 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	1.4 A
• Cable length, max.	100 m
<b>Absolute encoder (SSI) encoder supply</b>	
• Absolute encoder (SSI)	Yes
• Short-circuit protection	Yes
<b>Power loss</b>	
Power loss, typ.	12 W
<b>Digital inputs</b>	
Number of digital inputs	10
<b>Input voltage</b>	
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	8 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", min.	15 µs
<b>Cable length</b>	
• shielded, max.	100 m

Article number	<b>6ES7174-0AA10-0AA0</b> IM 174 for connecting analog Drives
<b>Digital outputs</b>	
Number of digital outputs	8
Short-circuit protection	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	1 A
• on lamp load, max.	30 W
<b>Output voltage</b>	
• Rated value (DC)	24 V; L+
• for signal "1", min.	L+ (-3 V)
• for signal "1", max.	3 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 55 °C, min.	5 mA
• for signal "1" permissible range for 0 to 55 °C, max.	300 mA
• for signal "0" residual current, max.	0.4 mA
<b>Switching frequency</b>	
• with resistive load, max.	500 Hz
• with inductive load, max.	0.5 Hz
<b>Relay outputs</b>	
• Number of relay outputs	4
• Number of operating cycles, max.	50 000
<b>Switching capacity of contacts</b>	
- with resistive load, max.	1 A
<b>Cable length</b>	
• shielded, max.	600 m
<b>Analog outputs</b>	
Number of analog outputs	4
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit

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## Technical specifications

Article number	<b>6ES7174-0AA10-0AA0</b> IM 174 for connecting analog Drives
<b>Encoder</b>	
Number of connectable encoders, max.	4
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input voltage	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
• Cable length, shielded, max.	35 m; 35 m at max. 500 kHz; 10 m at max. 1 MHz
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length, parameterizable	13, 21, 24 bit
• Clock frequency, max.	1.5 MHz; 187.5 KHz 1.5 MHz (parameterizable)
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	250 m; 250 m at 187.5 kHz, 10 m at 1.5 MHz
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes

Article number	<b>6ES7174-0AA10-0AA0</b> IM 174 for connecting analog Drives
<b>Drive interface</b>	
Number of drive interfaces	4
<b>Analog drive</b>	
<b>Setpoint signal</b>	
- Short-circuit proof	Yes; max. 45 mA, min. 3.3 kOhm load impedance
- Rated voltage range	-10.5 V to +10.5 V
- Output current	-3 to +3 mA
<b>Output controller enable</b>	
- Number of relay contacts	4
- Switching voltage, max.	30 V
- Switching current, max.	1 A
- Switching capacity, max.	30 V·A
- Number of switching cycles, min.	50 000; at 30 V DC, 1 A
- Cable length, shielded, max.	35 m
<b>Stepper drive</b>	
• Differential output voltage, min.	2 V; R = 100 Ohm
• Differential output voltage for signal "0", max.	1 V; For I = -20 mA
• Differential output voltage for signal "1", min.	3.7 V; 3.7 V at I = -20 mA; 4.5 V at I = -100 µA,
• Load resistance, min.	55 Ω
• Output current, max.	60 mA
• Pulse frequency	750 kHz
• Cable length, shielded, max.	50 m; in hybrid operation with analog axes 35 m, in asymmetrical transmission 10 m
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C
<b>Connection method</b>	
required front connector	40-pin
<b>Dimensions</b>	
Width	160 mm
Height	125 mm
Depth	118 mm
<b>Weights</b>	
Weight, approx.	1 kg

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Function modules

**SIWAREX U****Overview**

SIWAREX U is a versatile weighing module for all simple weighing and force measuring tasks. The compact module can be integrated into SIMATIC automation systems without any problems. Complete data access is then possible via the SIMATIC.

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**Ordering data****Article No.****SIWAREX U**

For SIMATIC S7 and ET 200M, incl. bus connector, weight 0.3 kg (0.661 lb)

Single-channel version<sup>1)</sup> for connecting one scale

**7MH4950-1AA01**

Two-channel version<sup>2)</sup> for connecting two scales

**7MH4950-2AA01****SIWATOOL V4 & V7**

Service and commissioning software for SIWAREX weighing modules

**7MH4900-1AK01****SIWAREX U configuration package for PCS 7, version 8.0**

Suitable for 7MH4950-xAA01

- Function block for CFC
- Faceplate
- Manual

**7MH4950-3AK62****SIWAREX PCS 7 AddOn Library for PCS 7 V8.x and V9.0**

- Supports PROFINET

APL faceplates and function blocks for:

- SIWAREX U
- SIWAREX FTA
- SIWAREX FTC\_B (belt scale)
- SIWAREX WP321

Classic faceplate and function block for:

- SIWAREX FTC\_L (Loss-in-weight)

**7MH4900-1AK61****SIWATOOL connection cable**

From SIWAREX U/CS with serial PC interface, for 9-pin PC interfaces (RS 232), length 3 m (9.84 ft)

**7MH4607-8CA****Installation material (mandatory)****20-pin front connector with screw contacts**

Required for each SIWAREX module

**6ES7392-1AJ00-0AA0****Shield connection element**

Sufficient for two SIWAREX U modules

**6ES7390-5AA00-0AA0****Article No.****Shield connection clamp**

Contents: 2 units (suitable for cable with diameter 4 ... 13 mm / 0.16 ... 0.51 inch)

Note:

One shield connection clamp is required for each of the following:

- Scale connection
- RS 485 interface
- RS 232 interface

**6ES7390-5CA00-0AA0****S7 DIN rail**

- 160 mm (6.30 inch)
- 480 mm (18.90 inch)
- 530 mm (20.87 inch)
- 830 mm (32.68 inch)
- 2 000 mm (78.74 inch)

**6ES7390-1AB60-0AA0**  
**6ES7390-1AE80-0AA0**  
**6ES7390-1AF30-0AA0**  
**6ES7390-1AJ30-0AA0**  
**6ES7390-1BC00-0AA0**

**Accessories (optional)****Labeling strips**

(10 units, spare part)

**6ES7392-2XX00-0AA0****Remote displays (option)**

The digital remote displays can be connected directly to SIWAREX U through a TTY interface.

The following remote displays can be used: S102, S302

Siebert Industrieelektronik GmbH  
 PO Box 1180  
 D-66565 Eppelborn  
 Tel.: +49 6806/980-0  
 Fax: +49 6806/980-999

Internet:

<https://www.siebert-group.com/en/>

Detailed information is available from the manufacturer.

**SIWAREX JB junction box, aluminum housing****7MH5001-0AA20**

For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.

<sup>1)</sup> Compatible with 7MH4601-1AA01; supply of load cells changed to 6 V DC.

<sup>2)</sup> Compatible with 7MH4601-1BA01; supply of load cells changed to 6 V DC.



Ordering data	Article No.	Commissioning	Article No.
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel.	7MH5001-0AA00	<b>Commissioning charge for one static scale with SIWAREX module</b> (Flat charge for travel and setup must be ordered separately)  Scope: <ul style="list-style-type: none"> <li>Recording of data</li> <li>Checking of mechanical installation of the scale</li> <li>Checking of electrical wiring and function</li> <li>Static adjustment of the scale</li> </ul> Requirements: <ul style="list-style-type: none"> <li>Mechanical design functional</li> <li>Modules electrically wired and tested</li> <li>Calibration weights available</li> <li>Free access to scale</li> </ul>	9LA1110-8SN50-0AA0
<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	7MH5001-0AA01		
<b>SIWAREX IS Ex interface</b> For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. <ul style="list-style-type: none"> <li>With short-circuit current &lt; 199 mA DC</li> <li>With short-circuit current &lt; 137 mA DC</li> </ul>	7MH4710-5BA  7MH4710-5CA	<b>Flat charge for travel and setup in Germany</b>	9LA1110-8RA10-0AA0
<b>Cable (optional)</b>			
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY</b> For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. <ul style="list-style-type: none"> <li>Sheath color: orange</li> <li>For hazardous atmospheres. Sheath color: blue.</li> </ul>	7MH4702-8AG 7MH4702-8AF		

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## SIWAREX U

### Technical specifications

SIWAREX U	
<b>Integration in automation systems</b>	
<ul style="list-style-type: none"> <li>S7-300</li> <li>S7-1500</li> <li>S7-400 (H)</li> <li>PCS 7 (H)</li> <li>Automation systems from other vendors</li> <li>Stand-alone (without SIMATIC CPU)</li> </ul>	Direct integration Through ET 200M Through ET 200M Through ET 200M Through ET 200M Possible with IM 153-1
<b>Communication interfaces</b>	
	<ul style="list-style-type: none"> <li>SIMATIC S7 (P bus)</li> <li>RS 232</li> <li>TTY</li> </ul>
<b>Connection of remote display (via serial TTY interface)</b>	
	Gross, channel 1, 2 or default value 1, 2
<b>Scale adjustment</b>	
	Through SIMATIC (P bus) or PC using SIWATOOL U (RS 232)
<b>Measuring properties</b>	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution ADC	65 535
Data format weight values	2 bytes (fixed-point)
<b>Number of measurements/second</b>	
	50
<b>Digital filter</b>	
	0.05 ... 5 Hz (in 7 steps), mean value filter
<b>Weighing functions</b>	
Weight values	Gross
Limit values	2 (min./max.)
Zero-setting function	Per command
<b>Load cells</b>	
	Strain gauges in 4-wire or 6-wire system

SIWAREX U	
<b>Load cell powering</b>	
Supply voltage $U_s$ (rated value)	6 V DC <sup>1)</sup>
Max. supply current	≤ 150 mA per channel
<b>Permissible load resistance</b>	
<ul style="list-style-type: none"> <li><math>R_{Lmin}</math></li> <li><math>R_{Lmax}</math></li> </ul>	> 40 Ω per channel < 4 010 Ω
<b>With Ex(i) interface</b>	
<ul style="list-style-type: none"> <li><math>R_{Lmin}</math></li> <li><math>R_{Lmax}</math></li> </ul>	> 87 Ω per channel < 4 010 Ω
<b>Permissible load cell characteristic</b>	
	Up to 4 mV/V
<b>Max. distance of load cells</b>	
	<ul style="list-style-type: none"> <li>500 m<sup>2)</sup></li> <li>150/500 m for gas group IIC</li> <li>500 m<sup>2)</sup> for gas group IIB (see SIWAREX IS Manual)</li> </ul>
<b>Intrinsically-safe load cell powering</b>	
	Optional (Ex interface) with SIWAREX IS
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	150 mA (single-channel) / 240 mA (dual-channel)
Current consumption on backplane bus	≤ 100 mA
<b>Certification</b>	
	ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
<b>IP degree of protection to DIN EN 60529; IEC 60529</b>	
	IP20
<b>Climatic requirements</b>	
$T_{min}$ (IND) ... $T_{max}$ (IND) (operating temperature)	
<ul style="list-style-type: none"> <li>Horizontal installation</li> <li>Vertical installation</li> </ul>	0 ... +60 °C (32 ... 140 °F) 0 ... +40 °C (32 ... 104 °F)
<b>EMC requirements according to</b>	
	According to NAMUR NE21, Part 1; EN 61326
<b>Dimensions</b>	
	40 × 125 × 130 mm (1.58 × 4.92 × 5.12 inch)

<sup>1)</sup> Load cell supply changed to 6 V DC as compared to 7MH4601-1AA01 and 7MH4601-1BA01.

<sup>2)</sup> Possible up to 1 000 m under certain conditions when using the recommended cable (accessories).

## Overview



SIWAREX FTA (Flexible Technology, Automatic Weighing Instrument) is a versatile and flexible weighing module for industrial use. It can be used in both non-automatic and automatic weighing operation, for example the production of mixtures, and for filling, loading, monitoring and bag filling.

It has the corresponding scale approvals and is also suitable for weighing systems requiring official calibration.

The SIWAREX FTA function module is integrated in SIMATIC S7/PCS 7 and uses the features of this modern automation system, such as integrated communication, diagnostics and configuration tools.

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>SIWAREX FTA</b> Legal-for-trade electronic weighing systems for automatic scales for S7-300 and ET 200M. EU type approval 3 x 6000 d Applications: Dosing, filling, bagging, loading. Note: Observe approval conditions for applications requiring official calibration. We recommend using our calibration set and contacting our SIWAREX hotline.	7MH4900-2AA01	<b>Configuration package SIWAREX FTA for SIMATIC PCS 7, Version 8.0 on CD-ROM</b> • HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • Manual	7MH4900-2AK63
<b>SIPLUS FTA</b> SIPLUS FTA -10 ... +60 °C with conformal coating based on 7MH4900-2AA01 Legal-for-trade electronic weighing system for automatic scales for S7-300 and ET 200M. EU type approval 3 x 6000 d Application areas: Dosing, filling, bagging, loading. Note: Observe approval conditions for applications requiring official calibration. We recommend using our calibration set and contacting our SIWAREX hotline.	6AG1900-2AA01-4AA0	<b>SIWAREX PCS 7 AddOn Library for PCS 7 V8.x and V9.0</b> • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scale) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (Loss-in-weight)	7MH4900-1AK61
<b>SIWAREX FTA Equipment Manual</b> Available in a range of languages Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>Calibration set for SIWAREX FTA</b> For verification of up to 5 scales comprising: • 3 x inscription foils for ID label • 1 x protective film • Guidelines for verification, verification certificates and approvals, editable label, SIWAREX FTA Equipment Manual on CD-ROM	7MH4900-2AY10
<b>SIWAREX FTA "Getting Started"</b> Sample software shows beginners how to program the scales in STEP 7. Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>SIWATOOL connection cable</b> From SIWAREX FTA with serial PC interface, for 9-pin PC interfaces (RS 232) • 2 m long (6.56 ft) • 5 m long (16.40 ft)	7MH4702-8CA 7MH4702-8CB
<b>SIWATOOL V4 &amp; V7</b> Service and commissioning software for SIWAREX weighing modules	7MH4900-1AK01	<b>Front connector, 40-pin</b> Required for each SIWAREX module • With screw contacts • With spring-loaded terminals	6ES7392-1AM00-0AA0 6ES7392-1BM01-0AA0

## SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## SIWAREX FTA

Ordering data	Article No.	Article No.
<b>Shield connection element</b> Sufficient for one SIWAREX FTA module	6ES7390-5AA00-0AA0	
<b>Shield connection clamp</b> Contents: 2 units (suitable for cable with diameter 4 ... 13 mm / 0.16 ... 0.51 inch) Note: One shield connection clamp is required for each of the following: <ul style="list-style-type: none"> <li>• Scale connection</li> <li>• RS 485 interface</li> <li>• RS 232 interface</li> </ul>	6ES7390-5CA00-0AA0	
<b>S7 DIN rail</b> <ul style="list-style-type: none"> <li>• 160 mm (6.30 inch)</li> <li>• 480 mm (18.90 inch)</li> <li>• 530 mm (20.87 inch)</li> <li>• 830 mm (32.68 inch)</li> <li>• 2 000 mm (78.74 inch)</li> </ul>	6ES7390-1AB60-0AA0 6ES7390-1AE80-0AA0 6ES7390-1AF30-0AA0 6ES7390-1AJ30-0AA0 6ES7390-1BC00-0AA0	
<b>MMC memory</b> For data recording up to 32 MB, only for legal-for-trade applications R76, R51 and R107	7MH4900-2AY21	
<b>Remote displays (option)</b> The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTA via an RS 485 interface. Siebert Industrieelektronik GmbH PO Box 1180 D-66565 Eppelborn Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: <a href="https://www.siebert-group.com/en/">https://www.siebert-group.com/en/</a> Detailed information is available from the manufacturer.		<b>Ex interface SIWAREX IS</b> For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. <ul style="list-style-type: none"> <li>• With short-circuit current &lt; 199 mA DC</li> <li>• With short-circuit current &lt; 137 mA DC</li> </ul>
<b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting several junction boxes	7MH5001-0AA20	7MH4710-5BA
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel.	7MH5001-0AA00	7MH4710-5CA
<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	7MH5001-0AA01	
		<b>Cable (optional)</b> <b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY</b> For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. <ul style="list-style-type: none"> <li>• Sheath color: orange</li> <li>• For hazardous atmospheres. Sheath color: blue.</li> </ul>
		<b>Commissioning</b> <b>Commissioning charge for one static scale with SIWAREX module</b> (Flat charge for travel and setup must be ordered separately) Scope: <ul style="list-style-type: none"> <li>• Recording of data</li> <li>• Checking of mechanical installation of the scale</li> <li>• Checking of electrical wiring and function</li> <li>• Static adjustment of the scale</li> </ul> Requirements: <ul style="list-style-type: none"> <li>• Mechanical design functional</li> <li>• Modules electrically wired and tested</li> <li>• Calibration weights available</li> <li>• Free access to scale</li> </ul>
		<b>Flat charge for travel and setup in Germany</b>
		9LA1110-8SN50-0AA0
		9LA1110-8RA10-0AA0

## Technical specifications

SIWAREX FTA	
<b>Use in automation systems</b>	
S7-300	Directly or via ET 200M
S7-1500	Through ET 200M
S7-400 (H)	Through ET 200M
PCS 7 (H)	Through ET 200M
<b>Communication interfaces</b>	
S7	Through backplane bus
RS 232	For SIWATOOL or printer connection
RS 485	For remote display or digital load cell
<b>Module parameterization</b>	
	Using SIMATIC S7
	Using SIWATOOL FTA software (RS 232)
<b>Measuring properties</b>	
EU type approval as non automatic weighing instrument, trade class III	3 x 6 000 d ≥ 0.5 μV/e
Internal resolution	16 million parts
Internal/external updating rate	400/100 Hz
<b>Several parameterizable digital filters</b>	Critically dampened, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter
<b>Weighing functions</b>	
Non automatic weighing instrument	OIML R76
Automatic weighing machine	OIML R51, R61, R107
<b>Load cells</b>	
	Strain gauges in 4-wire or 6-wire system
3 characteristic value ranges	1, 2 or 4 mV/V
<b>Load cell powering</b>	
Supply voltage $U_S$ (rated value)	10.3 V DC
Max. supply current	184 mA
Permissible load cell resistance	
• $R_{Lmin}$	> 56 Ω
	> 87 Ω with Ex interface
• $R_{Lmax}$	≤ 4 010 Ω

SIWAREX FTA	
<b>Max. distance of load cells</b>	
When using the recommended cable:	
Standard	1 000 m (3 280 ft)
In hazardous area <sup>1)</sup>	
• For gases of group IIC	300 m (984 ft)
• For gases of group IIB	1000 m (3 280 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
<b>Ex approvals zone 2 and safety</b>	ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	500 mA
Current consumption on backplane bus	Typ. 55 mA
<b>Inputs/outputs</b>	
Digital inputs	7 DI electrically isolated
Digital outputs	8 DO electrically isolated
Counter input	Up to 10 kHz
Analog output	
• Current range	0/4 ... 20 mA
• Updating rate	100 Hz
<b>Approvals</b>	EU type approval (CE, OIML R76)
	EU prototype test according to MID (OIML R51, R61, R107)
<b>Degree of protection according to EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b>	
$T_{min}$ (IND) ... $T_{max}$ (IND) (operating temperature)	
• Horizontal installation	-10 ... 60 °C (14 ... 140 °F)
• Vertical installation	-10 ... 40 °C (14 ... 104 °F)
<b>EMC requirements</b>	EN 61326, EN 45501, NAMUR NE21, Part 1
<b>Dimensions</b>	80 × 125 × 130 mm (3.15 × 4.92 × 5.12 inch)
<b>Weight</b>	600 g (0.44 lb)

<sup>1)</sup> For further details, see Ex interface, type SIWAREX IS.

## SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

### SIWAREX FTC

#### Overview



The SIWAREX FTC (Flexible Technology for Continuous Weighing) is a versatile and flexible weighing module for belt scales, loss-in-weight feeders and solids flowmeters. It can also be used to record weights and measure force. The SIWAREX FTC function module is integrated in SIMATIC S7/PCS 7 and uses the features of this modern automation system, such as integrated communication, diagnostics and configuration tools.

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Ordering data	Article No.	Ordering data	Article No.
<b>SIWAREX FTC</b> Electronic weighing system for S7-300 and ET 200M. Applications: Belt scales, force measurement, loss-in-weight scales and solids flowmeters	7MH4900-3AA01	<b>SIWATOOL V4 &amp; V7</b> Service and commissioning software for SIWAREX weighing modules	7MH4900-1AK01
<b>SIWAREX FTC_B Equipment Manual for belt scales</b> Available in a range of languages Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>SIWAREX PCS 7 AddOn Library for PCS7 V8.x and V9.0</b> • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scale) • SIWAREX WP321	7MH4900-1AK61
<b>SIWAREX FTC_L Equipment Manual for solids flowmeters and loss-in-weight scales</b> Available in a range of languages Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		Classic faceplate and function block for: • SIWAREX FTC_L (Loss-in-weight)	
<b>SIWAREX FTC "Getting Started" for belt scales</b> Sample software shows beginners how to program the scales in STEP 7 for belt scale mode Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>SIWATOOL connection cable</b> from SIWAREX FTC with serial PC interface, for 9-pin PC interfaces (RS 232) • 2 m long (6.56 ft) • 5 m long (16.40 ft)	7MH4702-8CA 7MH4702-8CB
<b>SIWAREX FTC "Getting Started" for solids flowmeters</b> Sample software shows beginners how to program the scales in STEP 7 for solids flowmeter mode Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>40-pin front connector with screw contacts</b> Required for each SIWAREX module • With screw contacts • With spring-loaded terminals	6ES7392-1AM00-0AA0 6ES7392-1BM01-0AA0
<b>SIWAREX FTC "Getting Started" for loss-in-weight scales</b> Sample software shows beginners how to program the scales in STEP 7 for loss-in-weight scale mode Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>Shield connection element</b> Sufficient for one SIWAREX FTC module	6ES7390-5AA00-0AA0
		<b>Shield connection clamp</b> Contents: 2 units (suitable for cable with diameter 4 ... 13 mm / 0.16 ... 0.51 inch) Note: One shield connection clamp is required for each of the following: • Scale connection • RS 485 interface • RS 232 interface	6ES7390-5CA00-0AA0

Ordering data	Article No.	Article No.
<b>S7 DIN rail</b> <ul style="list-style-type: none"> <li>• 160 mm (6.30 inch)</li> <li>• 480 mm (18.90 inch)</li> <li>• 530 mm (20.87 inch)</li> <li>• 830 mm (32.68 inch)</li> <li>• 2 000 mm (78.74 inch)</li> </ul>	<b>6ES7390-1AB60-0AA0</b> <b>6ES7390-1AE80-0AA0</b> <b>6ES7390-1AF30-0AA0</b> <b>6ES7390-1AJ30-0AA0</b> <b>6ES7390-1BC00-0AA0</b>	
<b>MMC memory</b> For data logging up to 32 MB, only for legal-for-trade applications R76, R51 and R107	<b>7MH4900-2AY21</b>	
<b>Remote display (optional)</b> The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTC via an RS 485 interface. (not suitable for belt scale mode) Siebert Industrieelektronik GmbH PO Box 1180 D-66565 Eppelborn Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: <a href="https://www.siebert-group.com/en/">https://www.siebert-group.com/en/</a> Detailed information is available from the manufacturer.		
<b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	<b>7MH5001-0AA20</b>	
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel.	<b>7MH5001-0AA00</b>	
<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	<b>7MH5001-0AA01</b>	
<b>Ex interface SIWAREX IS</b> For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. <ul style="list-style-type: none"> <li>• With short-circuit current &lt; 199 mA DC</li> <li>• With short-circuit current &lt; 137 mA DC</li> </ul>	<b>7MH4710-5BA</b>  <b>7MH4710-5CA</b>	
		<b>Cable (optional)</b> <b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY</b> For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. <ul style="list-style-type: none"> <li>• Sheath color: orange</li> <li>• For hazardous atmospheres. Sheath color: blue.</li> </ul>
		<b>Commissioning</b> <b>Commissioning charge for one belt scale with SIWAREX module</b> (Flat charge for travel and setup must be ordered separately) Scope: <ul style="list-style-type: none"> <li>• Recording of data</li> <li>• Checking of mechanical installation of the scale</li> <li>• Checking of electrical wiring and function</li> <li>• Dynamic adjustment of the scale</li> </ul> Requirements: <ul style="list-style-type: none"> <li>• Mechanical design functional</li> <li>• Modules electrically wired and tested</li> <li>• Calibration weights available</li> <li>• Free access to scale</li> </ul>
		<b>Flat charge for travel and setup in Germany</b>
		<b>7MH4702-8AG</b> <b>7MH4702-8AF</b>  <b>9LA1110-8SM50-0AA0</b>  <b>9LA1110-8RA10-0AA0</b>

# SIMATIC S7-300 Advanced Controllers

I/O modules

Function modules

## SIWAREX FTC

### Technical specifications

SIWAREX FTC	
<b>Use in automation systems</b>	
S7-300	Directly or via ET 200M
S7-1500	Through ET 200M
S7-400 (H)	Through ET 200M
PCS 7 (H)	Through ET 200M
<b>Communication interfaces</b>	
S7	Through backplane bus
RS 232	For SIWATOOL or printer connection
RS 485	For remote display or digital load cell
<b>Module parameterization</b>	
	Using SIMATIC S7
	Using SIWATOOL FTC software (RS 232)
<b>Measuring properties</b>	
Accuracy according to EN 45501	$3 \times 6\,000 d \geq 0.5 \mu\text{V/e}$
Internal resolution	+/- 8 million parts
Internal/external updating rate	400/100 Hz
<b>Several parameterizable digital filters</b>	Critically damped, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter
<b>Weighing functions</b>	<ul style="list-style-type: none"> <li>• Non automatic weighing instrument, force measurement</li> <li>• Belt scale</li> <li>• Loss-in-weight scale</li> <li>• Solids flowmeters</li> </ul>
<b>Load cells</b>	Strain gauges in 4-wire or 6-wire system
3 characteristic value ranges	1, 2 or 4 mV/V
<b>Load cell powering</b>	
Supply voltage $U_S$ (rated value)	10.3 V DC
Max. supply current	184 mA
Permissible load cell resistance	
• $R_{Lmin}$	> 56 $\Omega$
	> 87 $\Omega$ with Ex interface
• $R_{Lmax}$	$\leq 4\,010 \Omega$

SIWAREX FTC	
<b>Max. distance of load cells</b>	
When using the recommended cable:	
Standard	1 000 m (3 280 ft)
In hazardous area <sup>1)</sup>	
• For gases of group IIC	300 m (984 ft)
• For gases of group IIB	1 000 m (3 280 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
<b>Ex approvals zone 2 and safety</b>	ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	500 mA
Current consumption on backplane bus	Typ. 55 mA
<b>Inputs/outputs</b>	
Digital inputs	7, electrically isolated
Digital outputs	8, electrically isolated
Counter input	Up to 10 kHz
Analog output	
• Current range	0/4 ... 20 mA
• Updating rate	100 Hz
<b>Degree of protection according to EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b>	
$T_{min}$ (IND) ... $T_{max}$ (IND) (operating temperature)	
• Horizontal installation	-10 ... 60 °C (14 ... 140 °F)
• Vertical installation	-10 ... 40 °C (14 ... 104 °F)
<b>EMC requirements</b>	EN 61326, EN 45501, NAMUR NE21, Part 1
<b>Dimensions</b>	80 × 125 × 130 mm (3.15 × 4.92 × 5.12 inch)
<b>Weight</b>	600 g (0.44 lb)

<sup>1)</sup> For further details, see Ex interface, type SIWAREX IS.



**Overview**

- Single-channel, intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 definable comparison values
- Integrated digital outputs for output of the response on reaching the comparison value
- Operating modes:
  - Continuous counting
  - Single counting
  - Periodic counting
- Special functions:
  - Set counter
  - Latch counter
- Start/stop counter by gate function

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS S7-300 FM 350-1 counter module**

With 1 channel, max. 500 kHz;  
for incremental encoder

*For industrial applications with  
extended ambient conditions*

Extended temperature range and  
exposure to media

**6AG1350-1AH03-2AE0****Accessories**

*Mandatory*

**Front connector**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

*Consumables*

**Bus connectors**

1 unit (spare part)

**6ES7390-0AA00-0AA0****Shield connection element**

80 mm wide, with 2 rows for  
4 shield connection clamps each

**6ES7390-5AA00-0AA0****Shield connection clamps**

2 units

For 1 cable,  
diameter 3 mm to 8 mm

**6ES7390-5BA00-0AA0**

For 1 cable,  
diameter 4 mm to 13 mm

**6ES7390-5CA00-0AA0****Article No.****Label cover**

10 units (spare part), for modules  
with 20-pin front connector

**6ES7392-2XY00-0AA0****Labeling strips**

10 units (spare part), for modules  
with 20-pin front connector

**6ES7392-2XX00-0AA0****Slot number plates****6ES7912-0AA00-0AA0**

*Documentation*

**SIMATIC Manual Collection**

Electronic manuals on DVD,  
multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC Distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC-based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection  
update service for 1 year**

Current Manual Collection DVD and  
the three subsequent updates

**6ES7998-8XC01-8YE2**

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 function modules

**SIPLUS S7-300 FM 350-1****Technical specifications**

Article number	<b>6AG1350-1AH03-2AE0</b>
Based on	<b>6ES7350-1AH03-0AE0</b> SIPLUS S7-300 FM350-1
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1350-1AH03-2AE0</b>
Based on	<b>6ES7350-1AH03-0AE0</b> SIPLUS S7-300 FM350-1
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

## Overview



- 8-channel intelligent counter module for universal counting and measuring tasks
- For the direct connection of 24 V incremental encoders, directional encoders, initiators or NAMUR encoders
- Comparison function with predefined comparison values (number depending on operating mode)
- Integrated digital outputs for output of the response on reaching the comparison value
- Operating modes:
  - Continuous / single / periodic counting
  - Frequency and speed control
  - Period measurement
  - Dosing

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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## Ordering data

## Article No.

## Article No.

**SIPLUS S7-300 FM 350-2 counter module**

With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; includes configuration package and electronic documentation on CD

Exposure to media

**6AG1350-2AH01-4AE0**

**Accessories***Mandatory***Front connector**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**  
**6ES7392-1BM01-1AB0**

*Consumables***Bus connectors**

1 unit (spare part)

**6ES7390-0AA00-0AA0**

**Shield connection clamps**

2 units

For 2 cables, diameter 2 mm to 6 mm

**6ES7390-5AB00-0AA0**

For 1 cable, diameter 3 mm to 8 mm

**6ES7390-5BA00-0AA0**

For 1 cable, diameter 4 mm to 13 mm

**6ES7390-5CA00-0AA0**

**Label cover**

10 units (spare part), for modules with 40-pin front connector

**6ES7392-2XY10-0AA0**

**Labeling strips**

10 units (spare part), for modules with 40-pin front connector

**6ES7392-2XX10-0AA0**

**Slot number plates**

**6ES7912-0AA00-0AA0**

*Documentation***SIMATIC Manual Collection**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0**

**SIMATIC Manual Collection update service for 1 year**

Current Manual Collection DVD and the three subsequent updates

**6ES7998-8XC01-8YE2**

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 function modules

**SIPLUS S7-300 FM 350-2****Technical specifications**

Article number	<b>6AG1350-2AH01-4AE0</b>
Based on	<b>6ES7350-2AH01-0AE0</b> SIPLUS S7-300 FM350-2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C; = Tmin
• max.	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1350-2AH01-4AE0</b>
Based on	<b>6ES7350-2AH01-0AE0</b> SIPLUS S7-300 FM350-2
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

## Overview

**SIPLUS SIWAREX U electronic weighing system**

SIPLUS SIWAREX U is a flexible weighing module for all simple weighing and force measuring tasks. The compact module can be integrated into SIPLUS automation systems without any problems.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS SIWAREX U electronic weighing system**

<b>Article No.</b>	<b>6AG1 950-2AA01-4AA0</b>
<b>Article No. based on</b>	<b>7MH4 950-2AA01</b>
Range of ambient temperature	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning when condensation present

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**Ordering data****Article No.****Article No.****SIPLUS SIWAREX U**

Electronic weighing system for SIPLUS S7 and ET 200M, incl. bus connector

Exposure to media

**6AG1950-2AA01-4AA0**

**Accessories**

*Mandatory*

**Front connector**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**

**6ES7392-1BJ00-1AB0**

*Consumables*

**Bus connectors**

1 unit (spare part)

**6ES7390-0AA00-0AA0**

**Shield connection clamps**

2 units

For 2 cables, diameter 2 mm to 6 mm

**6ES7390-5AB00-0AA0**

For 1 cable, diameter 3 mm to 8 mm

**6ES7390-5BA00-0AA0**

For 1 cable, diameter 4 mm to 13 mm

**6ES7390-5CA00-0AA0**

**Labeling strips**

10 units (spare part)

**6ES7392-2XX00-0AA0**

**Label cover**

10 units (spare part)

**6ES7392-2XY00-0AA0**

**Slot number plates**

**6ES7912-0AA00-0AA0**

**SIWAREX JB junction box, aluminum housing**

For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes

**7MH5001-0AA20**

**SIWAREX JB junction box, stainless steel housing**

For connecting up to 4 load cells in parallel

**7MH5001-0AA00**

**SIWAREX JB junction box, stainless steel housing (ATEX)**

For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).

**7MH5001-0AA01**

**Ex interface, type SIWAREX IS**

With ATEX approval, but without UL and FM approvals, for intrinsically safe connection of load cells

Incl. Equipment Manual

Suitable for SIWAREX U, CS, MS, FTA, FTC and CF weighing modules

Approved for use in the EU

- With short-circuit current < 199 mA DC
- With short-circuit current < 137 mA DC

**7MH4710-5BA**

**7MH4710-5CA**

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 function modules

**SIPLUS SIWAREX U**

Ordering data	Article No.	Article No.
<b>Cables (optional)</b>		
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, orange sheath</b> For connecting SIWAREX U, CS, MS, FTA, FTC and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JB's; for fixed laying, occasional bending permitted, 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)	<b>7MH4702-8AG</b>	<i>Configuration software</i> <b>SIWATOOL V4 &amp; V7</b> Service and commissioning software for SIWAREX weighing modules <b>7MH4900-1AK01</b>
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, blue sheath</b> For connecting the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)	<b>7MH4702-8AF</b>	<b>SIWAREX U configuration package for PCS 7, version 8.0</b> Suitable for 7MH4950-xAA01 <ul style="list-style-type: none"> <li>• Function block for the CFC chart</li> <li>• Faceplate</li> <li>• Manual</li> </ul> <b>7MH4950-3AK62</b>
		<b>SIWAREX PCS 7 AddOn Library for PCS 7 V8.x and V9.0</b> <ul style="list-style-type: none"> <li>• Supports PROFINET</li> </ul> APL faceplates and function blocks for: <ul style="list-style-type: none"> <li>• SIWAREX U</li> <li>• SIWAREX FTA</li> <li>• SIWAREX FTC_B (belt scales)</li> <li>• SIWAREX WP321</li> </ul> Classic faceplate and function block for: <ul style="list-style-type: none"> <li>• SIWAREX FTC_L (Loss-in-weight)</li> </ul>
		<i>Documentation</i> <b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC <b>6ES7998-8XC01-8YE0</b>
		<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates <b>6ES7998-8XC01-8YE2</b>

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## Overview



SIPLUS SIWAREX FTA (Flexible Technology, Automatic Weighing Instrument) is a versatile and flexible weighing module for industrial use. It can be used in both non-automatic and automatic weighing operation, for example the production of mixtures, and for filling, loading, monitoring and bag filling.

It has the corresponding scale approvals and is also suitable for legal-for-trade weighing systems.

The SIPLUS SIWAREX FTA function module is integrated in SIMATIC S7/PCS7 and uses the features of this modern automation system, such as integrated communication, diagnostics and configuration tools.

## Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information has been added.

SIPLUS SIWAREX FTA	
<b>Article No.</b>	<b>6AG1900-2AA01-4AA0</b>
<b>Article No. based on</b>	<b>7MH4900-2AA01</b>
Ambient temperature range	-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply, except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning under condensation conditions.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold, fungal and dry rot spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!

## Ordering data

## SIPLUS SIWAREX FTA

## Article No.

6AG1900-2AA01-4AA0

Weighing electronics with official calibration capability for (automatic) scales for S7-300 and ET 200M EU type approval 3 x 6000 d  
Application areas: Proportioning, filling, bagging, loading.  
Notice: Observe approval conditions for applications with verification obligations. We recommend using our calibration set and contacting our SIWAREX hotline.

Exposure to media

## Accessories

## Mandatory

## MMC memory

7MH4900-2AY21

For data recording up to 32 MB, only for R76, R51 and R107 applications with calibration capability

## Front connector

40-pin

- With screw connections
- With spring-loaded contacts

6ES7392-1AM00-0AA0  
6ES7392-1BM01-1AB0

## Article No.

## Consumables

## Bus connectors

6ES7390-0AA00-0AA0

1 unit (spare part)

## Shield connection clamps

2 units; one shield connection clamp each is required for the weighing instrument connection, RS 485 interface and RS 232 interface

For 1 cable, diameter 4 mm to 13 mm

6ES7390-5CA00-0AA0

## Shield connection element

6ES7390-5AA00-0AA0

Sufficient for one SIWAREX FTA module

## SIWAREX JB junction box, aluminum housing

7MH5001-0AA20

For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes

## SIWAREX JB junction box, stainless steel housing

7MH5001-0AA00

For connecting up to 4 load cells in parallel.

## SIWAREX JB junction box, stainless steel housing (ATEX)

7MH5001-0AA01

For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 function modules

**SIPLUS SIWAREX FTA****Ordering data****Article No.****Article No.****Ex interface, type SIWAREX IS**

For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of the load cells must be checked separately.

- With short-circuit current < 199 mA DC
- With short-circuit current < 137 mA DC

**7MH4710-5BA****7MH4710-5CA****Cables (optional)****Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, orange sheath**

For connecting SIWAREX electronic weighing systems to junction boxes (JB), extension boxes (EB) and Ex interface or between two JB's. For permanent installation. Occasional bending is permitted.

Outer diameter:  
approx. 10.8 mm (0.43 inch)  
Permissible ambient temperature  
-40 ... +80 °C (-40 ... +176 °F)

Sold by the meter

Sheath color: orange

**7MH4702-8AG**

For hazardous areas.  
Sheath color: blue

**7MH4702-8AF***Configuration software***SIWATOOL V4 & V7**

Service and commissioning software for SIWAREX weighing modules

**7MH4900-1AK01****SIWAREX PCS 7 AddOn Library for PCS 7 V8.x and V9.0**

- Supports PROFINET

APL faceplates and function blocks for:

- SIWAREX U
- SIWAREX FTA
- SIWAREX FTC\_B (belt scales)
- SIWAREX WP321

Classic faceplate and function block for:

- SIWAREX FTC\_L (loss in weight)

**7MH4900-1AK61****Calibration set for SIWAREX FTA**

For verification of up to 5 scales, comprising:

- 3 x inscription foil for labeling
- 1 x protective foil
- Guidelines for verification, verification certificates and approvals, adaptable label, SIWAREX FTA Manual on CD-ROM

**7MH4900-2AY10****SIWATOOL connection cable**

From SIWAREX FTA with serial PC interface, for 9-pin PC interfaces (RS 232)

- 2 m long (6.56 ft)
- 5 m long (16.40 ft)

**7MH4702-8CA****7MH4702-8CB***Documentation***SIWAREX FTA Manual**

Available in a range of languages

Free download from the Internet at:

<http://www.siemens.com/weighing/documentation>

**SIWAREX FTA "Getting started"**

Sample software shows beginners how to program the scales in STEP 7.

Free download on the Internet at:

<http://www.siemens.com/weighing/documentation>

**SIMATIC Manual Collection****6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC Distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC-based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection update service for 1 year****6ES7998-8XC01-8YE2**

Current Manual Collection DVD and the three subsequent updates



## Overview



- The economical complete solution for serial communication via point-to-point links.
- 3 versions with different transmission interfaces:
  - RS 232C (V.24)
  - 20 mA (TTY)
  - RS 422/RS 485 (X.27)
- Implemented protocols:
  - ASCII
  - 3964 (R) (not for RS 485)
  - Printer driver
- Simple parameterization via a parameterization tool integrated into STEP 7

## Ordering data

## Article No.

<b>CP 340 communications module</b> With one RS 232 C (V.24) interface	<b>6ES7340-1AH02-0AE0</b>
<b>RS 232 connecting cable</b> For linking to SIMATIC S7	
5 m	<b>6ES7902-1AB00-0AA0</b>
10 m	<b>6ES7902-1AC00-0AA0</b>
15 m	<b>6ES7902-1AD00-0AA0</b>
<b>CP 340 communications module</b> With one 20 mA (TTY) interface	<b>6ES7340-1BH02-0AE0</b>
<b>20 mA (TTY) connecting cable</b> For linking to SIMATIC S7	
5 m	<b>6ES7902-2AB00-0AA0</b>
10 m	<b>6ES7902-2AC00-0AA0</b>
50 m	<b>6ES7902-2AG00-0AA0</b>
<b>CP 340 communications module</b> With one RS 422/485 (X.27) interface	<b>6ES7340-1CH02-0AE0</b>
<b>RS 422/485 connecting cable</b> For linking to SIMATIC S7	
5 m	<b>6ES7902-3AB00-0AA0</b>
10 m	<b>6ES7902-3AC00-0AA0</b>
50 m	<b>6ES7902-3AG00-0AA0</b>

## Technical specifications

Article number	<b>6ES7340-1AH02-0AE0</b> CP340 w. RS232C interface(V.24)	<b>6ES7340-1BH02-0AE0</b> CP340 w. 20MA interface(TTY)	<b>6ES7340-1CH02-0AE0</b> CP340 w. RS422/485 interface
<b>General information</b>			
Product type designation	CP 340	CP 340	CP 340
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	No; Power supply via backplane bus 5V	No; Power supply via backplane bus 5V	No; Power supply via backplane bus 5V
<b>Input current</b>			
from backplane bus 5 V DC, max.	165 mA	190 mA	165 mA
<b>Power loss</b>			
Power loss, typ.	0.6 W	0.85 W	0.6 W
<b>Interfaces</b>			
Interfaces/bus type	RS 232C (V.24)	20 mA (TTY)	
Number of interfaces	1; Isolated	1; Isolated	1; Isolated
Transmission rate, min.	2.4 kbit/s	2.4 kbit/s	2.4 kbit/s
Transmission rate, max.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s
<b>Point-to-point connection</b>			
• Cable length, max.	15 m	1 000 m; 100 m active, 1 000 m pas-sive	1 200 m
• supported printers	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined
• Connector type	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
<b>Integrated protocol driver</b>			
- 3964 (R)	Yes	Yes	Yes
- ASCII	Yes	Yes	Yes
- RK 512	No	No	No
- customer-specific drivers reloadable	No	No	No
<b>Telegram length, max.</b>			
- 3964 (R)	1 024 byte	1 024 byte	1 024 byte
- ASCII	1 024 byte	1 024 byte	1 024 byte

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Communication

**CP 340****Technical specifications**

Article number	<b>6ES7340-1AH02-0AE0</b> CP340 w. RS232C interface(V.24)	<b>6ES7340-1BH02-0AE0</b> CP340 w. 20MA interface(TTY)	<b>6ES7340-1CH02-0AE0</b> CP340 w. RS422/485 interface
<b>Transmission rate, 20 mA (TTY)</b>			
- with 3964 (R) protocol, max.		19.2 kbit/s	
- with ASCII protocol, max.		9.6 kbit/s	
- with printer driver, max.		9.6 kbit/s	
<b>Transmission rate, RS 422/485</b>			
- with 3964 (R) protocol, max.			19.2 kbit/s
- with ASCII protocol, max.			9.6 kbit/s
- with printer driver, max.			9.6 kbit/s
<b>Transmission speed, RS 232</b>			
- with 3964 (R) protocol, max.	19.2 kbit/s		
- with ASCII protocol, max.	9.6 kbit/s		
- with printer driver, max.	9.6 kbit/s		
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Ambient temperature during storage/transportation</b>			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
<b>Software</b>			
<b>Block</b>			
• FB length in RAM, max.	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving
<b>Connection method</b>			
Design of electrical connection for supply voltage	Over backplane bus	Over backplane bus	Over backplane bus
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	300 g	300 g	300 g

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## Overview



- For quick, high-performance serial data exchange via point-to-point coupling
- 3 versions with different transmission physics:
  - RS 232C (V.24),
  - 20 mA (TTY),
  - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512
- The following protocols can also be loaded: Modbus RTU
- Simple parameter assignment using tool integrated in STEP 7

## Ordering data

## Article No.

**CP 341 communications module** **6ES7341-1AH02-0AE0**

With one RS 232 C (V.24) interface

**RS 232 connecting cable**

For linking to SIMATIC S7

5 m

**6ES7902-1AB00-0AA0**

10 m

**6ES7902-1AC00-0AA0**

15 m

**6ES7902-1AD00-0AA0**

**CP 341 communications module** **6ES7341-1BH02-0AE0**

With one 20 mA (TTY) interface

**20 mA (TTY) connecting cable**

For linking to SIMATIC S7

5 m

**6ES7902-2AB00-0AA0**

10 m

**6ES7902-2AC00-0AA0**

50 m

**6ES7902-2AG00-0AA0**

**CP 341 communications module** **6ES7341-1CH02-0AE0**

With one RS 422/485 (X.27) interface

**RS 422/485 connecting cable**

For linking to SIMATIC S7

5 m

**6ES7902-3AB00-0AA0**

10 m

**6ES7902-3AC00-0AA0**

50 m

**6ES7902-3AG00-0AA0**

**Loadable drivers for CP 341**

Modbus master (RTU format)

- Single license
- Single license, without software or documentation

**6ES7870-1AA01-0YA0**

**6ES7870-1AA01-0YA1**

Modbus slave (RTU format)

- Single license
- Single license, without software or documentation

**6ES7870-1AB01-0YA0**

**6ES7870-1AB01-0YA1**

## Technical specifications

Article number	<b>6ES7341-1AH02-0AE0</b> CP 341 RS232C (V.24)	<b>6ES7341-1BH02-0AE0</b> CP341 20mA-Interface (TTY)	<b>6ES7341-1CH02-0AE0</b> CP341 RS422/485-Interface
<b>General information</b>			
Product type designation	CP 341	CP 341	CP 341
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
<b>Input current</b>			
from supply voltage L+, max.	100 mA	100 mA	100 mA
from backplane bus 5 V DC, max.	70 mA	70 mA	70 mA
<b>Power loss</b>			
Power loss, typ.	1.6 W	1.6 W	1.6 W
<b>Interfaces</b>			
Interfaces/bus type	RS 232C (V.24)	20 mA (TTY)	
Number of interfaces	1; Isolated	1; Isolated	1; Isolated
Transmission rate, min.	0.3 kbit/s	0.3 kbit/s	0.3 kbit/s
Transmission rate, max.	115.2 kbit/s	19.2 kbit/s	115.2 kbit/s

## SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CP 341

## Technical specifications

Article number	6ES7341-1AH02-0AE0 CP 341 RS232C (V.24)	6ES7341-1BH02-0AE0 CP341 20mA-Interface (TTY)	6ES7341-1CH02-0AE0 CP341 RS422/485-Interface
<b>Point-to-point connection</b>			
• Cable length, max.	15 m	1 000 m	1 200 m
• supported printers	Serial printers	Serial printers	Serial printers
• Connector type	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
<b>Integrated protocol driver</b>			
- 3964 (R)	Yes	Yes	Yes; not with RS 485
- ASCII	Yes	Yes	Yes
- RK 512	Yes	Yes	Yes; not with RS 485
<b>Telegram length, max.</b>			
- 3964 (R)	4 096 byte	4 096 byte	4 096 byte
- ASCII	4 096 byte	4 096 byte	4 096 byte
- RK 512	4 096 byte	4 096 byte	4 096 byte
<b>Transmission rate, 20 mA (TTY)</b>			
- with 3964 (R) protocol, max.		19.2 kbit/s	
- with ASCII protocol, max.		19.2 kbit/s	
- with printer driver, max.		19.2 kbit/s	
- with RK 512 protocol, max.		19.2 kbit/s	
<b>Transmission rate, RS 422/485</b>			
- with 3964 (R) protocol, max.			115.2 kbit/s
- with ASCII protocol, max.			115.2 kbit/s
- with printer driver, max.			115.2 kbit/s
- with RK 512 protocol, max.			115.2 kbit/s
<b>Transmission speed, RS 232</b>			
- with 3964 (R) protocol, max.	115.2 kbit/s		
- with ASCII protocol, max.	115.2 kbit/s		
- with printer driver, max.	115.2 kbit/s		
- with RK 512 protocol, max.	115.2 kbit/s		
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Ambient temperature during storage/transportation</b>			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
<b>Software</b>			
<b>Block</b>			
• FB length in RAM, max.	6 100 byte; Data communication, sending and receiving	6 100 byte; Data communication, sending and receiving	6 100 byte; Data communication, sending and receiving
<b>Connection method</b>			
Design of electrical connection for supply voltage	3 screw-type terminals: L+, M, GND	3 screw-type terminals: L+, M, GND	3 screw-type terminals: L+, M, GND
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	300 g	300 g	300 g

**Overview**

- Drivers for Modbus protocol with RTU message format; communication as master or slave
- Downloadable onto CP 341 and CP 441-2 (6ES7 441-2AA05-0AE0)

**Ordering data****Modbus Master V3.1**

Task:  
Communication via Modbus protocol with RTU format, SIMATIC S7 as master

Requirement:  
CP 341 or CP 441-2;  
STEP 7 V4.02 and higher

Delivery package:  
Driver program/documentation,  
English, German, French

Single license

**6ES7870-1AA01-0YA0**

Single license, without software and documentation

**6ES7870-1AA01-0YA1****Modbus Slave V3.1**

Task:  
Communication via Modbus protocol with RTU format, SIMATIC S7 as slave

Requirement:  
CP 341 or CP 441-2;  
STEP 7 V4.02 and higher

Delivery package:  
Driver program/documentation,  
English, German, French

Single license

**6ES7870-1AB01-0YA0**

Single license, without software and documentation

**6ES7870-1AB01-0YA1****Article No.****SIMATIC Manual Collection**

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection  
update service for 1 year**

Current "Manual Collection" DVD  
and the three subsequent updates

**6ES7998-8XC01-8YE2**

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## Loadable drivers for CP 441-2 and CP 341

### Technical specifications

Parameterization software	Loadable drivers for CP 441-2 and CP 341
Type of license	Simple license, copy license
Target system	SIMATIC CP 341, SIMATIC CP 441-2

#### Technical specifications

#### Modbus Master

- Modbus protocol with RTU format
- Master/slave coupling: SIMATIC S7 is master
- Function codes implemented: 01, 02, 03, 04, 05, 06, 07, 08, 11, 12, 15, 16
- No V.24 control and signal lines
- CRC polynomial:  $x^{16} + x^{15} + x^2 + 1$
- Interfaces: TTY (20 mA); V.24 (RS 232 C); X.27 (RS 422/485) 2-wire or 4-wire
- Receive mailbox specified on BRCV
- Character delay time 3.5 characters or multiple thereof
- Broadcast message possible
- Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)
- Character frame
- With/without RS 485 operation for 2-wire connections
- With/without modem operation (ignore smudge characters)
- Response monitoring time 100 ms to 25.5 s in steps of 100 ms
- Factor for the character delay time 1-10
- Default setting of receive line when using the X.27 interface module

Adjustable parameters

Adjustable parameters

#### Modbus slave

- Modbus protocol with RTU format
- Master/slave coupling: SIMATIC S7 is slave
- Function codes implemented: 01, 02, 03, 04, 05, 06, 08, 15, 16
- No V.24 control and signal line
- CRC polynomial:  $x^{16} + x^{15} + x^2 + 1$
- Interfaces: TTY (20 mA), V.24 (RS 232C), X.27 (RS 422/485) 2-wire or 4-wire
- Communications FB 180, instance DB 180 (use of a multi-instance)
- Conversion of the Modbus data address to S7 data areas. Data areas which can be processed: DB, bit memories, outputs, inputs, timers, counters
- Character delay time 3.5 characters or multiple thereof
- Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)
- Character frame
- Slave address of CP (1 to 255)
- With/without RS 485 operation for 2-wire connection
- With/without modem operation (ignore smudge characters)
- Factor for the character delay time 1-10
- Number of work DB (for FB processing)
- Enabling of memory areas for writing by the master
- Default setting of receive line when using the X.27 interface module
- Conversion of Modbus addresses to S7 data areas

**Overview**

The CP 343-2P communications processor is the AS-Interface master for the SIMATIC S7-300 and the ET 200M distributed I/O station, with user-friendly parameterizing options.

The CP 343-2 is the basic version of the module.

The CP 343-2P / CP 343-2 has the following characteristics:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- Status displays of operating states and indication of the readiness for operation of connected slaves by means of LEDs in the front panel
- Fault indications (including AS-Interface voltage fault, configuration fault) by means of LEDs in the front panel.
- Compact enclosure in the design of the SIMATIC S7-300
- Suitable for AS-Interface with 30-V voltage and AS-i Power24V (from product version 2/firmware version 3.1)
- Additionally for CP 343-2P: Supports the configuration of the AS-Interface-network with STEP 7 V5.2 and higher

**Design**

The CP 343-2P / CP 343-2 is connected like an I/O module to the S7-300. It has:

- Two terminal connections for connecting the AS-Interface cable directly.
- LEDs in the front panel for indicating the operating state and functional readiness of all connected and active slaves
- Pushbuttons for switching over the master operating state and for adopting the existing ACTUAL configuration of the AS-i slave as the TARGET configuration

**Function**

The CP 343-2P / CP 343-2 supports all specified functions of the extended AS-Interface Specification V3.0.

The CP 343-2P / CP 343-2 each occupy 16 bytes in the I/O address area of the SIMATIC S7-300. The digital I/O data of the standard slaves and A slaves is saved in this area. The digital I/O data of the B slaves and the analog I/O data can be accessed with the S7 system functions for read/write data records.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

For more information, see

<https://support.industry.siemens.com/cs/ww/en/view/51678777>.

**Notes on security**

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see

<http://www.siemens.com/industrialsecurity>.

**Configuration**

All connected AS-Interface slaves are configured at the press of a button. No further configuration of the CP is required.

**Additionally for CP 343-2P**

The CP 343-2P also supports configuring of the AS-Interface network with STEP 7 V5.2 and higher. Specifying the AS-i configuration in HW-Config facilitates the setting of slave parameters and documentation of the plant. Uploading the ACTUAL configuration of an already configured AS-Interface network is also supported. The saved configuration cannot be overwritten at the press of a button and is therefore tamper-proof.

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CP 343-2P/CP 343-2

### Benefits

- Shorter start-up times through simple configuration at the press of a button
- Design of flexible machine-related structures using the ET 200M distributed I/O system
- Enables diagnostics of the AS-Interface network
- Well suited also for complex applications thanks to connection options for 62 slaves and integral analog value processing
- Reduction of standstill and servicing times in the event of a fault thanks to the LED indicators:
  - Status of the AS-Interface network
  - Slaves connected and their readiness for operation
  - Monitoring of the AS-Interface voltage
- Lower costs for stock keeping and spare parts inventory because the CP can be used for the SIMATIC S7-300 and also for the ET 200M
- Additionally for CP 343-2P: Improved plant documentation and support for service assignments thanks to a description of the AS-Interface configuration in the STEP 7 project
- Simple operation with AS-Interface power supply unit (see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/8200165?tree=CatalogTree>) possible without restrictions
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. An S22.5 AS-i data decoupling module (e.g. 3RK1901-1DE12-1AA0) is required for the decoupling, see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10057533?tree=CatalogTree>.

### Application

The CP 343-2P / CP 343-2 is the AS-Interface master connection for the SIMATIC S7-300 and the ET 200M.

Through connection to AS-Interface it is possible to access max. 248 DI / 248 DQ per CP, using 62 A/B slaves with 4 DI / 4 DQ each.

With the integrated analog value processing, it is easy to transmit analog signals. Up to 62 analog slaves with an A/B address (each with up to two channels) or up to 31 analog slaves with a standard address (each with up to four channels) are possible per CP.

The CP 343-2P is the further development of the CP 343-2 and contains its entire functionality. An existing STEP 7 user program for a CP 343-2 can thus be used without restrictions with a CP 343-2P. It is only in STEP 7 HW-Config that the two modules are configured differently, with the CP 343-2P offering additional options. This is why the CP 343-2P is recommended.

### Ordering data

### Article No.

#### CP 343-2P

#### communications processor

- Device version with expanded configuration options for connection of SIMATIC S7-300 and ET 200M to AS-Interface
- Configuration of the AS-i network using the SET key or STEP 7
- Without front connector
- Corresponds to AS-Interface Specification V3.0
- Dimensions (W x H x D / mm): 40 x 125 x 120

6GK7343-2AH11-0XA0

#### CP 343-2

#### communications processor

- Basic version for connection of SIMATIC S7-300 and ET 200M to AS-Interface
- Configuration of the AS-i network using the SET key
- Without front connector
- Corresponds to AS-Interface Specification V3.0
- Dimensions (W x H x D / mm): 40 x 125 x 120

6GK7343-2AH01-0XA0

#### Accessories

#### Front connector, 20-pin

- With screw-type terminals
- With spring-loaded terminals

6ES7392-1AJ00-0AA0

6ES7392-1BJ00-0AA0

#### AS-Interface addressing unit V3.0

- For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0
- For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves)
- With input/output test function and many other commissioning functions
- Battery operation with four type AA batteries (IEC LR6, NEDA 15)
- Degree of protection IP40
- Dimensions (W x H x D / mm): 84 x 195 x 35
- Scope of supply:
  - Addressing unit with four batteries
  - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m

3RK1904-2AB02

### More information

#### More information

Manuals, see

<https://support.industry.siemens.com/cs/ww/en/ps/15754/man>

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/61892138>.

AS-Interface function block library for SIMATIC PCS 7 for easy connection of AS-Interface to PCS 7, see <https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10046725?tree=CatalogTree>.



## Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

- PROFIBUS DP master or slave with electrical interface for connecting the SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a programming device

## Ordering data

## Article No.

**CP 342-5 communications processor** **6GK7342-5DA03-0XE0**

Communications processor for electrical connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s, with electronic manual on CD-ROM

**Accessories****PROFIBUS FastConnect RS 485 connection plug**

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s

- Without programming device interface **6ES7972-0BA52-0XA0**
- With programming device interface **6ES7972-0BB52-0XA0**

**PROFIBUS bus connector IP20**

With connection to PPI, MPI, PROFIBUS

- Without programming device interface **6ES7972-0BA12-0XA0**
- With programming device interface **6ES7972-0BB12-0XA0**

**PROFIBUS FC Standard Cable**

2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter

**6XV1830-0EH10****PROFIBUS bus terminal 12M**

Bus terminal for connection of PROFIBUS nodes at up to 12 Mbps with connecting cable

**6GK1500-0AA10****SIMATIC S7-300 DM 370**

Dummy module; used for module replacement

**6ES7370-0AA01-0AA0**

## Technical specifications

Article number	<b>6GK7342-5DA03-0XE0</b>
product type designation	CP 342-5
<b>transfer rate</b>	
transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	4-pole terminal block

Article number	<b>6GK7342-5DA03-0XE0</b>
product type designation	CP 342-5
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	15 %
consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
• from external supply voltage at DC at 24 V typical	0.25 A
power loss [W]	6.75 W

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

CP 342-5

## Technical specifications

Article number	<b>6GK7342-5DA03-0XE0</b>
product type designation	CP 342-5
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 single width
width	40 mm
height	125 mm
depth	120 mm
net weight	0.3 kg
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	4
<b>performance data</b>	
<b>open communication</b>	
number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
data volume	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

Article number	<b>6GK7342-5DA03-0XE0</b>
product type designation	CP 342-5
<b>performance data PROFIBUS DP</b>	
service as DP master	
• DPV0	Yes
number of DP slaves	
• on DP master operable	124
data volume	
• of the address range of the inputs as DP master total	2 160 byte
• of the address range of the outputs as DP master total	2 160 byte
• of the address range of the inputs per DP slave	244 byte
• of the address range of the outputs per DP slave	244 byte
• of the address range of the diagnostic data per DP slave	240 byte
service as DP slave	
• DPV0	Yes
data volume	
• of the address range of the inputs as DP slave total	240 byte
• of the address range of the outputs as DP slave total	240 byte
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	
• without DP maximum	32
• with DP maximum	28
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	No
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 V5.1 SP2 or higher / STEP 7 Professional V12 (TIA Portal) or higher
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

- PROFIBUS DP master or slave with optical interface for connecting the SIMATIC S7-300 to PROFIBUS at up to 12 Mbps (including 45.45 Kbps)
- Direct connection to the optical PROFIBUS network via the integrated fiber-optic interface for plastic and PCF fiber-optic cables
- Communication services:
  - PROFIBUS DP
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a programming device

## Ordering data

## Article No.

**CP 342-5 FO communications processor****6GK7342-5DF00-0XE0**

Communication processor for optical connection of SIMATIC S7-300 to PROFIBUS to 12 Mbps with electronic manual on CD-ROM

**Accessories****PROFIBUS Plastic Fiber Optic, Simplex Connector/Polishing Set****6GK1901-0FB00-0AA0**

100 simplex connectors and 5 polishing sets for assembling PROFIBUS plastic fiber optic cables for the optical PROFIBUS DP

**PROFIBUS Plastic Fiber Optic, stripping tool set****6GK1905-6PA10**

Tools for removing the outer sheath and core sheath of plastic fiber optic cables

## Technical specifications

Article number	<b>6GK7342-5DF00-0XE0</b>
product type designation	CP 342-5 FO
<b>transfer rate</b>	
transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	0
number of electrical connections	
• for power supply	1
number of optical interfaces at the 1st interface acc. to PROFIBUS	2
design of the optical interface at the 1st interface acc. to PROFIBUS	Duplex socket
type of electrical connection	
• for power supply	4-pole terminal block

Article number	<b>6GK7342-5DF00-0XE0</b>
product type designation	CP 342-5 FO
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
supply voltage	24 V
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	15 %
consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
• from external supply voltage at DC at 24 V typical	0.25 A
power loss [W]	6 W

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CP 342-5 FO

### Technical specifications

Article number	<b>6GK7342-5DF00-0XE0</b>
product type designation	CP 342-5 FO
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module
width	40 mm
height	125 mm
depth	120 mm
net weight	0.3 kg
fastening method	
• S7-300 rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	4
wire length	
• for PCF FOC maximum	300 m
• for POF FOC maximum	50 m
<b>performance data open communication</b>	
number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
data volume	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

Article number	<b>6GK7342-5DF00-0XE0</b>
product type designation	CP 342-5 FO
<b>performance data PROFIBUS DP</b>	
service as DP master	
• DPV0	Yes
number of DP slaves	
• on DP master operable	124
data volume	
• of the address range of the inputs as DP master total	2 160 byte
• of the address range of the outputs as DP master total	2 160 byte
• of the address range of the inputs per DP slave	244 byte
• of the address range of the outputs per DP slave	244 byte
• of the address range of the diagnostic data per DP slave	240 byte
service as DP slave	
• DPV0	Yes
data volume	
• of the address range of the inputs as DP slave total	240 byte
• of the address range of the outputs as DP slave total	240 byte
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	
• without DP maximum	32
• with DP maximum	28
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	No
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 V5.1 SP2 or higher / STEP 7 Professional V12 (TIA Portal) or higher
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
		●	●	●	

Connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)

- Communication services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
  - PROFIBUS FMS
- Easy configuration and programming over PROFIBUS
- Can be easily integrated into the S7-300 system
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a programming device

## Ordering data

## Article No.

**CP 343-5 communications processor**
**6GK7343-5FA01-0XE0**

Communications processor for connection of S7-300 to PROFIBUS, FMS, open communication, PG/OP and S7 communication; with electronic manual on CD-ROM

**Accessories**
**STEP 7 Version 5.7**

Target system:  
SIMATIC S7-300/-400, SIMATIC C7

**Requirements:**

Windows 10 Professional/Enterprise, Windows Server 2016, Windows Server 2019

**Type of delivery:**

English, German, French, Spanish, Italian; including license key on USB flash drive, with electronic documentation

Floating license on DVD

**6ES7810-4CC12-0YA5**

Floating license, download<sup>1)</sup>; software, license key and documentation as download; consignee email address required for delivery

**6ES7810-4CE12-0YB5**

Rental license for 50 hours; software and documentation on DVD, license key on USB flash

**6ES7810-4CC12-0YA6**

Rental license for 50 hours, download<sup>1)</sup>; software, license key and documentation as download; consignee email address required for delivery

**6ES7810-4CE12-0YB6**

Upgrade floating license V5.3...5.6 to V5.7; on DVD

**6ES7810-4CC12-0YE5**

Upgrade floating license V5.3...V5.6 to V5.7, download<sup>1)</sup>; software, license key and documentation as download; consignee email address required for delivery

**6ES7810-4CE12-0YE5**

Trial license STEP 7 V5.7; on DVD, runs for 21 days

**6ES7810-4CC12-0YA7**
**PROFIBUS FastConnect RS485 bus connection plug**

With 90° cable outlet; insulation displacement technology, max. transfer rate 12 Mbit/s (1 unit)

- Without programming device interface
- With programming device interface

**6ES7972-0BA52-0XA0**
**6ES7972-0BB52-0XA0**
**PROFIBUS bus connector IP20**

With connection to PPI, MPI, PROFIBUS

- Without programming device interface
- With programming device interface

**6ES7972-0BA12-0XA0**
**6ES7972-0BB12-0XA0**
**PROFIBUS bus terminal 12M**
**6GK1500-0AA10**

Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable

**SIMATIC S7-300 DM 370**
**6ES7370-0AA01-0AA0**

Dummy module; used for module replacement

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

CP 343-5

## Technical specifications

Article number	<b>6GK7343-5FA01-0XE0</b>
product type designation	CP 343-5
<b>transfer rate</b>	
transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	4-pole terminal block
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
supply voltage	24 V
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	15 %
consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
• from external supply voltage at DC at 24 V typical	0.25 A
power loss [W]	5 W
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Article number	<b>6GK7343-5FA01-0XE0</b>
product type designation	CP 343-5
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 single width
width	40 mm
height	125 mm
depth	120 mm
net weight	0.3 kg
fastening method	
• S7-300 rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	4
<b>performance data open communication</b>	
number of possible connections for open communication by means of SEND/RECEIVE blocks maximum data volume	16
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte
<b>performance data FMS functions</b>	
number of possible connections for FMS connection maximum	16
data volume of the variables	
• for READ job maximum	237 byte
• for WRITE and REPORT job maximum	233 byte
number of variables	
• configurable from server to FMS partner	256
• loadable from server to FMS partner	256
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	48
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	No
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	STEP 7 V5.1 SP3 or higher and NCM S7 for PROFIBUS
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●			●	●

Communications processor for connecting a SIMATIC S7-300 to Industrial Ethernet networks, also as PROFINET IO Device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication

## Ordering data

## Article No.

**CP 343-1 Lean communications processor****6GK7343-1CX10-0XE0**

For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO Device, MRP, integrated 2-port switch ERTEC, comprehensive diagnostics facilities, module replacement without PG, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM

**Accessories****IE FC RJ45 Plug 145**

RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB30-0AA0**  
**6GK1901-1BB30-0AB0**  
**6GK1901-1BB30-0AE0**

**IE FC TP Standard Cable GP 2 x 2 (Type A)****6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m

**IE FC Stripping Tool****6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**Compact Switch Module CSM 377****6GK7377-1AA00-0AA0**

Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CP 343-1 Lean

### Technical specifications

Article number	<b>6GK7343-1CX10-0XE0</b>
product type designation	CP 343-1 Lean
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>interfaces</b>	
number of interfaces	2
acc. to Industrial Ethernet	
number of electrical connections	
• at the 1st interface	2
acc. to Industrial Ethernet	
• for power supply	1
type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at the 1st interface	RJ45 port
acc. to Industrial Ethernet	
type of electrical connection	
• for power supply	2-pole plugable terminal block
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
supply voltage	24 V
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	15 %
consumed current	
• from backplane bus at DC at 5 V typical	0.2 A
• from external supply voltage at DC at 24 V typical	0.16 A
• from external supply voltage at DC at 24 V maximum	0.2 A
power loss [W]	5.8 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Article number	<b>6GK7343-1CX10-0XE0</b>
product type designation	CP 343-1 Lean
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 single width
width	40 mm
height	125 mm
depth	120 mm
net weight	0.22 kg
fastening method	
• S7-300 rail mounting	Yes
<b>performance data open communication</b>	
number of possible connections for open communication by means of SEND/RECEIVE blocks maximum data volume	8
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
number of Multicast stations	8
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	4
service	
• of SIMATIC communication as server	Yes
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	12
<b>performance data PROFINET communication as PN IO controller</b>	
product function PROFINET IO controller	No

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## Technical specifications

Article number	<b>6GK7343-1CX10-0XE0</b>
product type designation	CP 343-1 Lean
<b>performance data</b>	
<b>PROFINET communication as PN IO device</b>	
product function PROFINET IO device	Yes
data volume	
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for output variables as PROFINET IO device maximum	512 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for output variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
number of submodules per PROFINET IO-Device	32
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	Yes
<b>product functions management, configuration, engineering</b>	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 V5.4 or higher / STEP 7 Professional V11 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/ location designation	Yes

Article number	<b>6GK7343-1CX10-0XE0</b>
product type designation	CP 343-1 Lean
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes
<b>product functions switch</b>	
product feature switch	Yes
product function	
• switch-managed	No
• with IRT PROFINET IO switch	No
• configuration with STEP 7	Yes
<b>product functions redundancy</b>	
product function	
• ring redundancy	Yes
• redundancy manager	No
protocol is supported	Yes
Media Redundancy Protocol (MRP)	
<b>product functions security</b>	
product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>product functions time</b>	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
<b>standards, specifications, approvals</b>	
<b>hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CP 343-1

### Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●			●	●

Communications processor for connecting a SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet networks, also as PROFINET IO Controller or IO Device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication

### Ordering data

#### CP 343-1 communications processor

For connection of SIMATIC S7-300 to Industrial Ethernet over ISO and TCP/IP; PROFINET IO Controller or PROFINET IO Device, MRP, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through IP access list, initialization over LAN 10/100 Mbps; with electronic manual on DVD

#### Accessories

##### IE FC RJ45 plug 180 2 x 2

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPUs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

##### IE FC RJ45 plug 145

RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

### Article No.

6GK7343-1EX30-0XE0

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

6GK1901-1BB30-0AA0  
6GK1901-1BB30-0AB0  
6GK1901-1BB30-0AE0

### Article No.

#### IE FC TP Standard Cable GP 2 x 2 (Type A)

4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

#### IE FC Stripping Tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

#### Compact Switch Module CSM 377

Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three further nodes to Industrial Ethernet operating at 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM

#### SCALANCE X204-2 Industrial Ethernet switch

Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports

6XV1840-2AH10

6GK1901-1GA00

6GK7377-1AA00-0AA0

6GK5204-2BB10-2AA3

#### Technical specifications

Article number	<b>6GK7343-1EX30-0XE0</b>
product type designation	CP 343-1
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	2
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
• for power supply	1
type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
type of electrical connection	
• for power supply	2-pole plugable terminal block
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
supply voltage	24 V
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	15 %
consumed current	
• from backplane bus at DC at 5 V typical	0.2 A
• from external supply voltage at DC at 24 V typical	0.16 A
• from external supply voltage at DC at 24 V maximum	0.2 A
power loss [W]	5.8 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Article number	<b>6GK7343-1EX30-0XE0</b>
product type designation	CP 343-1
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 single width
width	40 mm
height	125 mm
depth	120 mm
net weight	0.22 kg
fastening method	
• S7-300 rail mounting	Yes
<b>performance data open communication</b>	
number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
data volume	
• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
number of Multicast stations	16
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	32
<b>performance data PROFINET communication as PN IO controller</b>	
number of PN IO devices on PROFINET IO controller operable total	32
number of external PN IO lines with PROFINET per rack	1
data volume	
• as user data for input variables as PROFINET IO controller maximum	1 Kibyte
• as user data for output variables as PROFINET IO controller maximum	1 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CP 343-1

### Technical specifications

Article number	<b>6GK7343-1EX30-0XE0</b>
product type designation	CP 343-1
<b>performance data PROFINET communication as PN IO device</b>	
product function PROFINET IO device	Yes
data volume	
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for output variables as PROFINET IO device maximum	512 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for output variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
number of submodules per PROFINET IO-Device	32
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	Yes
<b>product functions management, configuration, engineering</b>	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 V5.4 SP2 or higher / STEP 7 Professional V11 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/ location designation	Yes

Article number	<b>6GK7343-1EX30-0XE0</b>
product type designation	CP 343-1
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes
<b>product functions switch</b>	
product feature switch	Yes
product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• configuration with STEP 7	Yes
<b>product functions redundancy</b>	
product function	
• ring redundancy	Yes
• redundancy manager	No
protocol is supported	Yes
Media Redundancy Protocol (MRP)	
<b>product functions security</b>	
product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>product functions time</b>	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●	●	●	●

Communications processor for connecting the SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet networks, also as PROFINET IO controller and IO device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication
- Security functionality, firewall and VPN

In addition, the CP 343-1 Advanced provides email functions and allows users to create their own Web pages - ideal support for maintenance and quality assurance. The Internet functions such as FTP even allow connection to the most diverse PC-based systems. This CP is therefore the bridge between the field level and the management level for the S7-300. The CP 343-1 Advanced connects seamlessly to the security structures of the office and IT world.

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## Ordering data

## Article No.

## Article No.

**CP 343-1 Advanced communications processor**

For connecting the SIMATIC S7-300 CPU to Industrial Ethernet;  
1 x 10/100/1 000 Mbps;  
2 x 10/100 Mbps (IE SWITCH);  
RJ 45 ports; TCP; UDP; ISO;  
PROFINET IO-Controller and Device, S7 communication (client + server); open communication (SEND/RECEIVE); S7 routing; IP configuration via DHCP/block; extended web diagnostics; time synchronization; IP Access Control List; IP routing; FTP; email; PROFINET CBA; C-PLUG

- With Security (Firewall + VPN) and PROFlenergy (Controller + Device)

6GK7343-1GX31-0XE0

**Accessories****IE FC RJ45 plug 180 2 x 2**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

**IE FC RJ45 plug 145**

RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB30-0AA0  
6GK1901-1BB30-0AB0  
6GK1901-1BB30-0AE0

**IE FC RJ45 plug 4 x 2**

RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB11-2AA0  
6GK1901-1BB11-2AB0  
6GK1901-1BB11-2AE0

**IE FC TP Standard Cable GP 2 x 2 (Type A)**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

6XV1840-2AH10

**IE FC TP Standard Cable GP 4 x 2**

8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

- AWG22, for connection to IE FC RJ45 Modular Outlet
- AWG24, for connection to IE FC RJ45 plug 4 x 2

6XV1870-2E  
6XV1878-2A

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CP 343-1 Advanced

### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>IE FC Stripping Tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>	<b>SCALANCE X204-2 Industrial Ethernet switch</b> Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>
<b>Compact Switch Module CSM 377</b> Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three further nodes to Industrial Ethernet operating at 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM	<b>6GK7377-1AA00-0AA0</b>	<b>SCALANCE X308-2 Industrial Ethernet switch</b> 2 x 1000 Mbps SC ports, optical (multimode, glass), up to 750 m, 1 x 10/100/1000 Mbps RJ45 port, electrical 7 x 10/100 Mbps RJ45 ports, electrical	<b>6GK5308-2FL10-2AA3</b>

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### Technical specifications

Article number	6GK7343-1GX31-0XE0	Article number	6GK7343-1GX31-0XE0
product type designation	CP 343-1 Advanced	product type designation	CP 343-1 Advanced
<b>transfer rate</b>		<b>ambient conditions</b>	
transfer rate		ambient temperature	
• at the 1st interface	10 ... 1 000 Mbit/s	• for vertical installation during operation	0 ... 40 °C
• at the 2nd interface	10 ... 100 Mbit/s	• for horizontally arranged busbars during operation	0 ... 60 °C
<b>interfaces</b>		• during storage	-40 ... +70 °C
number of interface acc. to Industrial Ethernet	3	• during transport	-40 ... +70 °C
number of electrical connections		relative humidity	
• at the 1st interface acc. to Industrial Ethernet	1	• at 25 °C without condensation during operation maximum	95 %
• at the 2nd interface acc. to Industrial Ethernet	2	protection class IP	IP20
• for power supply	1	<b>design, dimensions and weights</b>	
type of electrical connection		module format	Compact module
• at the 1st interface acc. to Industrial Ethernet	RJ45 port	width	80 mm
• at the 2nd interface acc. to Industrial Ethernet	RJ45 port	height	125 mm
type of electrical connection		depth	120 mm
• for power supply	2-pole plugable terminal block	net weight	0.8 kg
design of the removable storage		fastening method	
• C-PLUG	Yes	• S7-300 rail mounting	Yes
<b>supply voltage, current consumption, power loss</b>		<b>performance data</b>	
type of voltage of the supply voltage	DC	<b>open communication</b>	
supply voltage 1 from backplane bus	5 V	number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
supply voltage external	24 V	data volume	
supply voltage external at DC rated value	24 V	• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
relative positive tolerance at DC at 24 V	20 %	• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
relative negative tolerance at DC at 24 V	15 %	• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
consumed current		• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
• from backplane bus at DC at 5 V typical	0.14 A	number of Multicast stations	16
• from external supply voltage at DC at 24 V typical	0.48 A		
• from external supply voltage at DC at 24 V maximum	0.62 A		
power loss [W]	14.7 W		

#### Technical specifications

Article number	<b>6GK7343-1GX31-0XE0</b>
product type designation	CP 343-1 Advanced
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	48
<b>performance data IT functions</b>	
number of possible connections	
• as client by means of FTP maximum	10
• as server by means of FTP maximum	2
number of possible connections	
• as server by means of HTTP maximum	4
• as email client maximum	1
data volume as user data for email maximum	8 Kibyte
storage capacity of the user memory	
• as flash memory file system	28 Mibyte
• as RAM	30 Mibyte
number of possible write cycles of the flash memory cells	100 000
<b>performance data PROFINET communication as PN IO controller</b>	
product function PROFINET IO controller	Yes
number of PN IO devices on PROFINET IO controller operable total	128
number of PN IO IRT devices on PROFINET IO controller operable	128
number of external PN IO lines with PROFINET per rack	1
data volume	
• as user data for input variables as PROFINET IO controller maximum	4 Kibyte
• as user data for output variables as PROFINET IO controller maximum	4 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte

Article number	<b>6GK7343-1GX31-0XE0</b>
product type designation	CP 343-1 Advanced
<b>performance data PROFINET communication as PN IO device</b>	
product function PROFINET IO device	Yes
data volume	
• as user data for input variables as PROFINET IO device maximum	1 024 byte
• as user data for output variables as PROFINET IO device maximum	1 024 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for output variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
number of submodules per PROFINET IO-Device	32
<b>performance data PROFINET CBA</b>	
number of remote connection partners with PROFINET CBA	64
number of connections with PROFINET CBA total	1 000
data volume	
• as user data for digital inputs with PROFINET CBA maximum	8 Kibyte
• as user data for digital outputs with PROFINET CBA maximum	8 Kibyte
• as user data for arrays and data types in the case of acyclic transmission with PROFINET CBA maximum	8 Kibyte
• as user data for arrays and data types with PROFINET CBA with cyclical transfer maximum	250 byte
• as user data for arrays and data types with PROFINET CBA in the case of local interconnection maximum	2 400 byte
<b>performance data PROFINET CBA remote interconnection with acyclic transfer</b>	
update time of the remote interconnections in the case of acyclic transmission with PROFINET CBA	100 ms
number of remote connections to input variables in the case of acyclic transmission with PROFINET CBA maximum	128
number of remote connections to output variables in the case of acyclic transmission with PROFINET CBA maximum	128
data volume	
• as user data for remote interconnections with input variables in the case of acyclic transmission with PROFINET CBA	8 Kibyte
• as user data for remote interconnections with output variables in the case of acyclic transmission with PROFINET CBA	8 Kibyte

## SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CP 343-1 Advanced

## Technical specifications

Article number	<b>6GK7343-1GX31-0XE0</b>
product type designation	CP 343-1 Advanced
<b>performance data PROFINET CBA remote interconnection with cyclic transfer</b>	
update time of the remote interconnections with PROFINET CBA with cyclical transfer	8 ms
number of remote connections to input variables with PROFINET CBA with cyclical transfer maximum	200
number of remote connections to output variables with PROFINET CBA with cyclical transfer maximum	200
data volume	
• as user data for remote interconnections with input variables with PROFINET CBA with cyclical transfer maximum	2 000 byte
• as user data for remote interconnections with output variables with PROFINET CBA with cyclical transfer maximum	2 000 byte
<b>performance data PROFINET CBA HMI variables via PROFINET acyclic</b>	
number of connectable HMI stations for HMI variables in the case of acyclic transmission with PROFINET CBA	3
update time of the HMI variables in the case of acyclic transmission with PROFINET CBA	500 ms
number of HMI variables in the case of acyclic transmission with PROFINET CBA maximum	200
data volume as user data for HMI variables in the case of acyclic transmission with PROFINET CBA maximum	8 Kibyte
<b>performance data PROFINET CBA device-internal interconnections</b>	
number of internal connections with PROFINET CBA maximum	256
data volume of the internal connections with PROFINET CBA maximum	2 400 byte
<b>performance data PROFINET CBA interconnections to constants</b>	
number of connections with constants with PROFINET CBA maximum	200
data volume as user data for interconnections with constants with PROFINET CBA maximum	4 096 byte
<b>performance data PROFINET CBA PROFIBUS proxy functionality</b>	
product function with PROFINET CBA PROFIBUS proxy functionality	No
<b>performance data telecontrol</b>	
protocol is supported	
• TCP/IP	Yes

Article number	<b>6GK7343-1GX31-0XE0</b>
product type designation	CP 343-1 Advanced
<b>product functions management, configuration, engineering</b>	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP7 V5.5 SP2 HF1 or higher / STEP 7 Professional V12 (TIA Portal) or higher
• for PROFINET CBA required identification & maintenance function	SIMATIC iMap V3.0 SP4 and higher
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes
<b>product functions switch</b>	
product feature switch	Yes
product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• configuration with STEP 7	Yes
<b>product functions redundancy</b>	
product function	
• ring redundancy	Yes
• redundancy manager	Yes
protocol is supported	Yes
Media Redundancy Protocol (MRP)	
<b>product functions security</b>	
firewall version	stateful inspection
product function with VPN connection	IPSec
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1
number of possible connections with VPN connection	32
product function	
• password protection for Web applications	Yes
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	Yes
• switch-off of non-required services	Yes
• blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>product functions time</b>	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



- Unmanaged switch for connecting a SIMATIC S7-300 with integral PROFINET interface or an Industrial Ethernet CP or SIMATIC ET 200M to an Industrial Ethernet in an electrical line, tree or star structure
- As many as three additional nodes can be connected
- As an unmanaged switch, the CSM 377 is used for integrating small machines into existing automation networks or for the stand-alone operation of the machines
- Simple, space-saving attachment to SIMATIC S7-300 DIN rail due to design as single-width module in SIMATIC S7-300 format
- Low-cost solution for implementing small, local Ethernet networks
- Rugged, industry-standard node connections with PROFINET-compliant RJ45 plug connectors that latch onto the enclosure to offer additional strain and bending relief

## Ordering data

## Article No.

**Compact Switch Module CSM 377**

Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply; diagnostics on LEDs; S7-300 module including electronic manual on CD-ROM

**6GK7377-1AA00-0AA0****Accessories****IE FC TP Standard Cable GP 2 x 2 (Type A)**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45/ IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

**6XV1840-2AH10****IE FC RJ45 plug 180 2 x 2**

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

**IE FC Stripping Tool**

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**6GK1901-1GA00**

## Technical specifications

Article number	<b>6GK7377-1AA00-0AA0</b>
product type designation	SCALANCE CSM 377
<b>transfer rate</b>	
transfer rate	10 Mbit/s, 100 Mbit/s
<b>interfaces for communication integrated</b>	
number of electrical connections	
• for network components or terminal equipment	4
number of 100 Mbit/s SC ports	
• for multimode	0
number of 1000 Mbit/s LC ports	
• for multimode	0
• for single mode (LD)	0
<b>interfaces other</b>	
number of electrical connections	
• for power supply	1
type of electrical connection	
• for power supply	2-pole terminal block

Article number	<b>6GK7377-1AA00-0AA0</b>
product type designation	SCALANCE CSM 377
<b>supply voltage, current consumption, power loss</b>	
type of voltage 1 of the supply voltage	DC
• supply voltage 1 rated value	24 V
• power loss [W] 1 rated value	1.6 W
• supply voltage 1 rated value	19.2 ... 28.8 V
• consumed current 1 maximum	0.07 A
• type of electrical connection 1 for power supply	2-pole terminal block
• product component 1 fusing at power supply input	Yes

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## CSM 377 unmanaged

### Technical specifications

Article number	<b>6GK7377-1AA00-0AA0</b>
product type designation	SCALANCE CSM 377
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
design	SIMATIC S7-300 device design
width	40 mm
height	125 mm
depth	118 mm
net weight	0.2 kg
fastening method	
• 35 mm top hat DIN rail mounting	No
• wall mounting	No
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	No
<b>product functions management, configuration, engineering</b>	
product function	
• multiport mirroring	No
product function switch-managed	No
<b>product functions redundancy</b>	
product function	
• Parallel Redundancy Protocol (PRP)/operation in the PRP-network	Yes
• Parallel Redundancy Protocol (PRP)/Redundant Network Access (RNA)	No

Article number	<b>6GK7377-1AA00-0AA0</b>
product type designation	SCALANCE CSM 377
<b>standards, specifications, approvals</b>	
standard	
• for FM	FM3611: Class 1, Division 2, Group A, B, C, D / T...; CL.1, Zone 2, GP. IIC, T.: Ta
• for safety from CSA and UL	UL 508, CSA C22.2 No. 142
• for emitted interference	EN 61000-6-4:2001
• for interference immunity	EN 61000-6-2:2001
MTBF	144 y
<b>standards, specifications, approvals CE</b>	
certificate of suitability CE marking	Yes
<b>standards, specifications, approvals hazardous environments</b>	
standard for hazardous zone	EN 60079-15, II 3 G Ex nA II T...; KEMA 06 ATEX 0021 X
• from CSA and UL	UL 1604 and UL 2279-15 (Hazardous Location)
certificate of suitability	
• CCC for hazardous zone according to GB standard	Yes
<b>standards, specifications, approvals other</b>	
certificate of suitability	EN 61000-6-2:2001, EN 61000-6-4:2001
• C-Tick	Yes
• KC approval	No
<b>standards, specifications, approvals marine classification</b>	
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• French marine classification society (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No

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**Overview**

- SINAUT communications module TIM for SIMATIC S7-300 for use in a wide area network (WAN)
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via mobile wireless routers or wireless devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Frame buffer for seamless recording of data
- Simple configuration and operation without specialist IT knowledge

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**Ordering data****TIM 3V-IE communications module**

With an RS 232 interface for SINAUT communication via a conventional WAN or an IP-based network (WAN or LAN)

**Article No.****6NH7800-3BA00****SINAUT Engineering Software V5.5 + SP3**

On DVD, comprising

- SINAUT Engineering Software V5.5 for the PG
- SINAUT TD7 block library
- Electronic manual in German and English

**Article No.****6NH7997-0CA55-0AA0****Engineering Software STEP 7 Professional V17**

- SIMATIC STEP 7 Professional V17 floating license
- Upgrade SIMATIC STEP 7 Basic V11 ... V16 → V17 floating license

**Article No.****6ES7822-1AA07-0YA5****Article No.****6ES7822-0AA07-0YE5****Accessories****IE FC TP Standard Cable GP 2 x 2 (Type A)**

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval  
Sold by the meter;  
Max. delivery unit 1 000 m, minimum order quantity 20 m

**Article No.****6XV1840-2AH10****Article No.****IE FC RJ45 plug 180**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**Article No.****6GK1901-1BB10-2AA0****6GK1901-1BB10-2AB0****6GK1901-1BB10-2AE0****IE FC Stripping Tool**

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**Article No.****6GK1901-1GA00****Connecting cable**

For connecting a TIM (RS232) with the GSM modem MD720; also suitable for third-party modems or wireless devices with standard RS232 interface; Cable length 2.5 m

**Article No.****6NH7701-5AN****Connecting cable**

With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); Cable length 2.5 m

**Article No.****6NH7701-4BN****Connecting cable**

For connecting two TIM modules via their RS 232 interface without modems ("null modem"); cable length 6 m

**Article No.****6NH7701-0AR**

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## TIM 3V-IE (for S7-300)

### Technical specifications

Article number	<b>6NH7800-3BA00</b>
product type designation	TIM 3V-IE
<b>transfer rate</b>	
transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
type of electrical connection	
• at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole plugable terminal block
design of the removable storage	
• C-PLUG	No
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	20.4 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	20.4 ... 28.8 V
relative symmetrical tolerance at DC	
• at 5 V	5 %
relative positive tolerance at DC at 24 V	5 %
relative negative tolerance at DC at 24 V	5 %
consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.2 A
power loss [W]	5.8 W
product extension optional backup battery	No

Article number	<b>6NH7800-3BA00</b>
product type designation	TIM 3V-IE
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 single width
width	40 mm
height	125 mm
depth	120 mm
net weight	0.25 kg
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	1
• note	Number of TIM per S7-300
wire length	
• with RS 232 interface maximum	6 m
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	8
• with PG connections maximum	2
• with OP connections maximum	8
service	
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	12

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#### Technical specifications

Article number	<b>6NH7800-3BA00</b>
product type designation	TIM 3V-IE
<b>performance data telecontrol</b>	
suitability for use	
• node station	No
• substation	Yes
• TIM control center	No
• note	RS232 and Industrial Ethernet can not be operated in parallel
protocol is supported	
• DNP3	No
• SINAUT ST1 protocol	Yes
• SINAUT ST7 protocol	Yes
product function data buffering if connection is aborted	Yes; 16,000 data messages
storage capacity	
• of S7 CPU work memory for TD7onCPU mode data blocks on CPU required	20 Kibyte
• of S7 CPU work memory for TD7onTIM mode data blocks on TIM required	0 Kibyte
• note	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case
product feature buffered message frame memory	No
transmission format	
• for SINAUT ST1 protocol with polling 11 bit	Yes
• for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit	Yes
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST1 protocol	Polling, polling with time slot procedure
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure
• with dial-up network with SINAUT ST1 protocol	spontaneous
• with dial-up network with SINAUT ST7 protocol	spontaneous
hamming distance	
• for SINAUT ST1 protocol	4
• for SINAUT ST7 protocol	4

Article number	<b>6NH7800-3BA00</b>
product type designation	TIM 3V-IE
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	SINAUT ST7 ES
• for CPU configuring required SINAUT TD7 block library for CPU	Yes
• for PG configuring required SINAUT ST7 configuration software for PG	Yes
storage location of TIM configuration data	on the TIM
<b>product functions security</b>	
operating mode Virtual Private Network (VPN)	Yes; VPN operation as MSC client with MSC protocol and password protection only possible in conjunction with GPRS modem with MSC capability
type of authentication with Virtual Private Network PSK	Yes
product function	
• password protection for VPN	Yes
• MSC client via GPRS modem with MSC capability	Yes
protocol	
• is supported MSC protocol	No
key length for MSC with Virtual Private Network	128 bit
number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	0
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## TIM 3V-IE Advanced (for S7-300)

### Overview



- SINAUT communications module TIM for SIMATIC S7-300 for use in wide area network (WAN) as station, node station, and control center
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via mobile wireless routers or wireless devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

### Ordering data

#### TIM 3V-IE Advanced communications module

With an RS 232 interface and an RJ45 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)

#### Accessories

#### SINAUT Engineering Software V5.5 + SP3

On DVD, comprising

- SINAUT S7 Engineering Software V5.5 + SP3 for the PG
- SINAUT TD7 block library
- Electronic manual in German and English

#### SINAUT S7 Engineering Software Update from Version V5.0x to V5.5

SINAUT Engineering Software V5.5 upgrade; for owners of SINAUT Engineering Software Version V5.0 or higher

#### Engineering Software STEP 7 Professional V17

- SIMATIC STEP 7 Professional V17 floating license
- Upgrade SIMATIC STEP 7 Basic V11 ... V16 → V17 floating license

#### IE FC TP Standard Cable GP 2 x 2 (Type A)

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval  
Sold by the meter;  
Max. delivery unit 1 000 m, minimum order quantity 20 m

### Article No.

6NH7800-3CA00

6NH7997-0CA55-0AA0

6NH7997-0CA55-0GA0

6ES7822-1AA07-0YA5

6ES7822-0AA07-0YE5

6XV1840-2AH10

### Article No.

#### IE FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

#### IE FC Stripping Tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

#### Connecting cable

For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; Cable length 2.5 m

6NH7701-5AN

#### Connecting cable

With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); Cable length 2.5 m

6NH7701-4BN

#### Connecting cable

For connecting two TIM modules via their RS 232 interface without modems ("null modem"). Cable length 6 m

6NH7701-0AR

#### Technical specifications

Article number	<b>6NH7800-3CA00</b>
product type designation	TIM 3V-IE Advanced
<b>transfer rate</b>	
transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections • for external data transmission acc. to RS 232	1
• for power supply	1
type of electrical connection • of Industrial Ethernet interface	RJ45 port
type of electrical connection • at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole plugable terminal block
design of the removable storage • C-PLUG	No
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	20.4 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	20.4 ... 28.8 V
relative symmetrical tolerance at DC • at 5 V	5 %
relative positive tolerance at DC at 24 V	5 %
relative negative tolerance at DC at 24 V	5 %
consumed current • from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.2 A
power loss [W]	5.8 W
product extension optional backup battery	No

Article number	<b>6NH7800-3CA00</b>
product type designation	TIM 3V-IE Advanced
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 single width
width	40 mm
height	125 mm
depth	120 mm
net weight	0.25 kg
<b>product features, product functions, product components general</b>	
number of units • note	Number of TIMs per S7-300: multiple, number depends on the connection resources of the S7-300 CPU
wire length • with RS 232 interface maximum	6 m
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	24
• with PG connections maximum	4
• with OP connections maximum	20
service • SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	24

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## TIM 3V-IE Advanced (for S7-300)

### Technical specifications

Article number	<b>6NH7800-3CA00</b>
product type designation	TIM 3V-IE Advanced
<b>performance data telecontrol</b>	
suitability for use	
• node station	Yes
• substation	Yes
• TIM control center	Yes
• note	RS232 and Industrial Ethernet can be operated in parallel
protocol is supported	
• DNP3	No
• SINAUT ST1 protocol	Yes
• SINAUT ST7 protocol	Yes
product function data buffering if connection is aborted	Yes; 32,000 data messages
storage capacity	
• of S7 CPU work memory for TD7onCPU mode data blocks on CPU required	20 Kibyte
• of S7 CPU work memory for TD7onTIM mode data blocks on TIM required	0 Kibyte
• note	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case
product feature buffered message frame memory	No
transmission format	
• for SINAUT ST1 protocol with polling 11 bit	Yes
• for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit	Yes
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST1 protocol	Polling, polling with time slot procedure
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure
• with dial-up network with SINAUT ST1 protocol	spontaneous
• with dial-up network with SINAUT ST7 protocol	spontaneous
hamming distance	
• for SINAUT ST1 protocol	4
• for SINAUT ST7 protocol	4

Article number	<b>6NH7800-3CA00</b>
product type designation	TIM 3V-IE Advanced
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	SINAUT ST7 ES
• for CPU configuring required SINAUT TD7 block library for CPU	Yes
• for PG configuring required SINAUT ST7 configuration software for PG	Yes
storage location of TIM configuration data	on the TIM
<b>product functions security</b>	
operating mode Virtual Private Network (VPN)	Yes
type of authentication with Virtual Private Network PSK	Yes
product function	
• password protection for VPN	Yes
• MSC client via GPRS modem with MSC capability	Yes
protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
key length for MSC with Virtual Private Network	128 bit
number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	0
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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## Overview



- SINAUT communications module TIM with four interfaces for SIMATIC S7-300 or as self-contained unit for the S7-400 for use in the wide area network (WAN)
- For universal use in a SINAUT station, node station and control center
- Internet communication via integrated MSC-VPN tunnel with direct connection to DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via mobile wireless routers or wireless devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>TIM 4R-IE communications module</b> With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)	6NH7800-4BA00	<b>IE FC RJ45 plug 180</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface	
<b>Accessories</b> <b>SINAUT Engineering Software V5.5 + SP3</b> On DVD, comprising <ul style="list-style-type: none"> <li>• SINAUT ST7 Engineering Software V5.5 + SP3 for the PG</li> <li>• SINAUT TD7 block library</li> <li>• Electronic manual in German and English</li> </ul>	6NH7997-0CA55-0AA0	<ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0
<b>SINAUT ST7 Engineering Software Update from Version V5.0x to V5.5</b> SINAUT Engineering Software V5.5 upgrade; for owners of SINAUT Engineering Software Version V5.0 or higher	6NH7997-0CA55-0GA0	<b>IE FC Stripping Tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00
<b>Engineering Software STEP 7 Professional V17</b> <ul style="list-style-type: none"> <li>• SIMATIC STEP 7 Professional V17 floating license</li> <li>• Upgrade SIMATIC STEP 7 Basic V11 ... V16 → V17 floating license</li> </ul>	6ES7822-1AA07-0YA5 6ES7822-0AA07-0YE5	<b>Connecting cable</b> For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; Cable length 2.5 m	6NH7701-5AN
<b>Backup battery</b> 3.6 V/2.3 Ah for TIM 4R-IE	6ES7971-0BA00	<b>Connecting cable</b> With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); Cable length 2.5 m	6NH7701-4BN
<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval Sold by the meter; Max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-2AH10	<b>Connecting cable</b> For connecting two TIM modules via their RS 232 interface without modems ("null modem"). Cable length 6 m	6NH7701-0AR
		<b>SITOP compact 24 V/0.6 A</b> Single-phase power supply with wide-range input 85 ... 264 V AC/110 ... 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	6EP1331-5BA00

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## TIM 4R-IE (for S7-300/-400/PC)

### Technical specifications

Article number	<b>6NH7800-4BA00</b>
product type designation	TIM 4R-IE
<b>transfer rate</b>	
transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
<b>interfaces</b>	
number of interfaces	2
acc. to Industrial Ethernet	
number of electrical connections	
• for external data transmission	2
acc. to RS 232	
• for power supply	1
type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
type of electrical connection	
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• at interface 2 for external data transmission	9-pole D-sub connector, RS232 can be switched to RS485
• for power supply	2-pole pluggable terminal block
design of the removable storage	
• C-PLUG	Yes
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	20.4 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	20.4 ... 28.8 V
consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.17 A
power loss [W]	4.6 W
product extension optional backup battery	Yes
type of battery	Lithium AA / 3.6 V / 2.3 Ah
backup current	
• typical	100 µA
• maximum	160 µA

Article number	<b>6NH7800-4BA00</b>
product type designation	TIM 4R-IE
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 double width
width	80 mm
height	125 mm
depth	120 mm
net weight	0.4 kg
<b>product features, product functions, product components general</b>	
number of units	
• note	Number of TIM 4R-IE per S7-300/S7-400: multiple, number depends on the connection resources of the CPU
wire length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	64
• with PG connections maximum	2
• with OP connections maximum	62
service	
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	128

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#### Technical specifications

Article number	<b>6NH7800-4BA00</b>
product type designation	TIM 4R-IE
<b>performance data telecontrol</b>	
suitability for use	
• node station	Yes
• substation	Yes
• TIM control center	Yes
protocol is supported	
• DNP3	No
• SINAUT ST1 protocol	Yes
• SINAUT ST7 protocol	Yes
product function data buffering if connection is aborted	Yes; 56,000 data messages
storage capacity	
• of S7 CPU work memory for TD7onCPU mode data blocks on CPU required	20 Kibyte
• of S7 CPU work memory for TD7onTIM mode data blocks on TIM required	0 Kibyte
• note	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case
product feature buffered message frame memory	Yes
transmission format	
• for SINAUT ST1 protocol with polling 11 bit	Yes
• for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit	Yes
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST1 protocol	Polling, polling with time slot procedure
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure
• with dial-up network with SINAUT ST1 protocol	spontaneous
• with dial-up network with SINAUT ST7 protocol	spontaneous
hamming distance	
• for SINAUT ST1 protocol	4
• for SINAUT ST7 protocol	4

Article number	<b>6NH7800-4BA00</b>
product type designation	TIM 4R-IE
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	SINAUT ST7 ES
• for CPU configuring required SINAUT TD7 block library for CPU	Yes
• for PG configuring required SINAUT ST7 configuration software for PG	Yes
storage location of TIM configuration data	on internal TIM flash memory, or on TIM in optional C-PLUG, or on MMC of the S7-300 CPU if TIM installed in S7-300 controller
<b>product functions security</b>	
operating mode Virtual Private Network (VPN)	Yes
type of authentication with Virtual Private Network PSK	Yes
product function	
• password protection for VPN	Yes
• MSC client via GPRS modem with MSC capability	Yes
protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
key length for MSC with Virtual Private Network	128 bit
number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	128
<b>product functions time</b>	
product component hardware real time clock	Yes
product feature hardware real time clock w. battery backup	Yes
accuracy of the hardware real time clock per day maximum	4 s
time synchronization	
• from NTP-server	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

## SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

### TIM 3V-IE DNP3 (for S7-300)

#### Overview



In a station for the S7-CPU, the communications module TIM 3V-IE DNP3 (TeleControl Interface Module) handles the data exchange with the assigned master system SIMATIC PCS 7 TeleControl V8.0 using the open DNP3 protocol. The module additionally supports master and node functionality.

- With the S7-300 housing, the module can be fully integrated into the S7-300 system
- The module has an RS232 interface for the connection of an external modem for data transmission via a conventional WAN or the connection of a Modbus RTU slave to an S7-300 system
- The RJ45 port is used for data transmission via IP-based networks

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#### Ordering data

#### Article No.

##### TIM 3V-IE DNP3 communications module

With an RS 232 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)

6NH7803-3BA00-0AA0

##### SINAUT Engineering Software V5.5 + SP3

On DVD, comprising

- SINAUT ST7 Engineering Software V5.5 for the PG
- SINAUT TD7 block library
- Electronic manual in German and English

6NH7997-0CA55-0AA0

##### SINAUT ST7 Engineering Software Update from Version V5.0x to V5.5

SINAUT Engineering Software V5.5 upgrade; for owners of SINAUT Engineering Software Version V5.0 or higher

6NH7997-0CA55-0GA0

#### Accessories

##### IE FC TP Standard Cable GP 2 x 2 (Type A)

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval  
Sold by the meter;  
Max. delivery unit 1 000 m, minimum order quantity 20 m

6XV1840-2AH10

#### Article No.

##### IE FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

##### IE FC Stripping Tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

##### Connecting cable

For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; Cable length 2.5 m

6NH7701-5AN

##### Connecting cable

With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); Cable length 2.5 m

6NH7701-4BN

##### Connecting cable

For connecting two TIM modules via their RS 232 interface without modems ("null modem"). Cable length 6 m

6NH7701-0AR

#### Technical specifications

Article number	<b>6NH7803-3BA00-0AA0</b>
product type designation	TIM 3V-IE DNP3
<b>transfer rate</b>	
transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	9 600 ... 38 400 bit/s
<b>interfaces</b>	
number of interfaces	1
acc. to Industrial Ethernet	
number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
type of electrical connection	
• at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole pluggable terminal block
design of the removable storage	
• C-PLUG	No
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	20.4 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	20.4 ... 28.8 V
consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.2 A
power loss [W]	5.8 W
product extension optional backup battery	No
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Article number	<b>6NH7803-3BA00-0AA0</b>
product type designation	TIM 3V-IE DNP3
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 single width
width	40 mm
height	125 mm
depth	120 mm
net weight	0.25 kg
<b>product features, product functions, product components general</b>	
number of units	
• note	Number of TIMs per S7-300: 1
wire length	
• with RS 232 interface maximum	6 m
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	3; only via LAN
• with PG connections maximum	2
• with OP connections maximum	1
service	
• PG/OP communication	Yes
<b>performance data telecontrol</b>	
suitability for use	
• node station	Yes
• substation	Yes
• TIM control center	Yes
protocol is supported	
• DNP3	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	No
• Modbus RTU	Yes
product function data buffering if connection is aborted	Yes; 64,000 data points with one master
number of DNP3 masters	
• for Ethernet maximum	8
• with RS 232 interface maximum	1
number of Modbus RTU slaves maximum	1
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	SINAUT ST7 ES
storage location of TIM configuration data	on the CPU or TIM
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## TIM 4R-IE DNP3 (for S7-300/-400)

### Overview



In a station for the S7-CPU, the communication module TIM 4R-IE DNP3 (TeleControl Interface Module) handles the data exchange with the assigned SIMATIC PCS7 TeleControl V8.0 master system using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the double-width S7-300 housing, the module can be fully integrated into the S7-300 system
- Can be connected as a stand-alone module to a SIMATIC S7-400 and SIMATIC S7-400 H System
- Two RS 232/RS 485 interfaces support connection of an external modem for data transmission via a conventional WAN or of a Modbus RTU slave to an S7-300 system
- The module has two RJ45 interfaces for data transmission via IP-based networks
- By using physically separate connection paths, the module permits media redundancy without loss of data during the switchover

### Ordering data

### Article No.

#### TIM 4R-IE DNP3 communications module

With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)

6NH7803-4BA00-0AA0

#### Accessories

##### SINAUT Engineering Software V5.5 + SP3

On DVD, comprising

- SINAUT ST7 Engineering Software V5.5 + SP3 for the PG
- SINAUT TD7 block library
- Electronic manual in German and English

6NH7997-0CA55-0AA0

##### SINAUT ST7 Engineering Software Update from Version V5.0x to V5.5

SINAUT Engineering Software V5.5 upgrade; for owners of SINAUT Engineering Software Version V5.0 or higher

6NH7997-0CA55-0GA0

##### Backup battery

3.6 V/2.3 Ah for TIM 4R-IE DNP3

6ES7971-0BA00

##### IE FC TP Standard Cable GP 2 x 2 (Type A)

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

6XV1840-2AH10

### Article No.

#### IE FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

#### IE FC Stripping Tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

#### Connecting cable

For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; Cable length 2.5 m

6NH7701-5AN

#### Connecting cable

With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); Cable length 2.5 m

6NH7701-4BN

#### Connecting cable

For connecting two TIM modules via their RS 232 interface without modems ("null modem"). Cable length 6 m

6NH7701-0AR

#### SITOP compact 24 V/0.6 A

Single-phase power supply with wide-range input 85 to 264 V AC/110 to 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design

6EP1331-5BA00

#### Technical specifications

Article number	<b>6NH7803-4BA00-0AA0</b>
product type designation	TIM 4R-IE DNP3
<b>transfer rate</b>	
transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	9 600 ... 115 200 bit/s
<b>interfaces</b>	
number of interfaces	2
acc. to Industrial Ethernet	
number of electrical connections	
• for external data transmission acc. to RS 232	2
• for power supply	1
type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
type of electrical connection	
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• at interface 2 for external data transmission	9-pole D-sub connector, RS232 can be switched to RS485
• for power supply	2-pole pluggable terminal block
design of the removable storage	
• C-PLUG	Yes
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	20.4 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	20.4 ... 28.8 V
consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.17 A
power loss [W]	4.6 W
product extension optional backup battery	Yes
type of battery	Lithium AA / 3.6 V / 2.3 Ah
backup current	
• typical	100 µA
• maximum	160 µA
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Article number	<b>6NH7803-4BA00-0AA0</b>
product type designation	TIM 4R-IE DNP3
<b>design, dimensions and weights</b>	
module format	Compact module S7-300 double width
width	80 mm
height	125 mm
depth	120 mm
net weight	0.4 kg
<b>product features, product functions, product components general</b>	
number of units	
• note	Number of TIMs per S7-300 / S7-400: 1
wire length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	5; only via LAN
• with PG connections maximum	2
• with OP connections maximum	1
service	
• PG/OP communication	Yes
<b>performance data telecontrol</b>	
suitability for use	
• node station	Yes
• substation	Yes
• TIM control center	Yes
protocol is supported	
• DNP3	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	No
• Modbus RTU	Yes
product function data buffering if connection is aborted	Yes; 200,000 data points with one master
number of DNP3 masters	
• for Ethernet maximum	8
• with RS 232 interface maximum	1
number of Modbus RTU slaves maximum	1
<b>product functions management, configuration, engineering</b>	
configuration software	
• required	SINAUT ST7 ES
storage location of TIM configuration data	on the CPU or TIM
<b>product functions time</b>	
product component hardware real time clock	Yes
product feature hardware real time clock w. battery backup	Yes
accuracy of the hardware real time clock per day maximum	4 s
time synchronization	
• from NTP-server	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

# SIMATIC S7-300 Advanced Controllers

I/O modules

Communication

## ASM 475

### Overview



The ASM 475 is a powerful communications module for connecting the MOBY D, SIMATIC RF200, RF300 and SIMATIC MV400, MV500 identification systems to the S7-300 and ET 200M.

### Ordering data

Ordering data	Article No.
<b>ASM 475 communications module</b> For SIMATIC S7-300 and ET 200M, parameterizable	<b>6GT2002-0GA10</b>
<b>Accessories</b>	
<b>Front connector (1 x per ASM 475)</b> <ul style="list-style-type: none"> <li>with screw terminals</li> <li>with spring-loaded terminals</li> </ul>	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1BJ00-0AA0</b>
<b>Shield connection element (80 mm wide for 2 x ASM 475)</b>	<b>6ES7390-5AA00-0AA0</b>
<b>Shield connection clamp (1 x per reader cable)</b>	<b>6ES7390-5BA00-0AA0</b>
<b>SIMATIC RF200 / RF300 / MV400 connecting cable</b> Pre-assembled, between ASM 475 and RF200 / RF300 / MV400, IP65, straight connector, PUR material, trailable, available in following lengths <sup>1)</sup> :	
2 m	<b>6GT2891-4EH20</b>
5 m	<b>6GT2891-4EH50</b>
<b>Extension cable</b> SIMATIC RF200 / RF300 / MV400, PUR material, trailable, straight connector	
2 m	<b>6GT2891-4FH20</b>
5 m	<b>6GT2891-4FH50</b>
10 m	<b>6GT2891-4FN10</b>
20 m	<b>6GT2891-4FN20</b>
50 m	<b>6GT2891-4FN50</b>

<sup>1)</sup> The connecting cables can be extended using RF300 connecting cables of type 6GT2891-4Fxxx. These connecting cables are available in the lengths 2 m, 5 m, 10 m, 20 m and 50 m.

### Technical specifications

Article number	<b>6GT2002-0GA10</b>
product type designation	ASM 475 communication module
<b>transfer rate</b>	
transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
<b>interfaces</b>	
design of the interface for point-to-point connection	RS422
number of readers connectable	2
type of electrical connection	
<ul style="list-style-type: none"> <li>of the backplane bus</li> <li>of the PROFIBUS interface</li> <li>of Industrial Ethernet interface</li> <li>for supply voltage</li> </ul>	S7-300 backplane bus (according to the head module) (according to the head module) Screw-type or spring-loaded terminals
design of the interface to the reader for communication	Screw-type or spring-loaded terminals
<b>mechanical data</b>	
material	Noryl
color	anthracite
<b>supply voltage, current consumption, power loss</b>	
supply voltage	
<ul style="list-style-type: none"> <li>at DC rated value</li> <li>at DC</li> </ul>	24 V 20 ... 30 V
consumed current at DC at 24 V	
<ul style="list-style-type: none"> <li>without connected devices typical</li> <li>with connected devices maximum</li> </ul>	0.1 A 1 A
<b>ambient conditions</b>	
ambient temperature	
<ul style="list-style-type: none"> <li>during operation</li> <li>during storage</li> <li>during transport</li> </ul>	0 ... 60 °C -40 ... +70 °C -40 ... +70 °C
protection class IP	IP20
shock resistance	According to IEC 61131-2
shock acceleration	150 m/s <sup>2</sup>
vibrational acceleration	10 m/s <sup>2</sup>
<b>design, dimensions and weights</b>	
width	40 mm
height	125 mm
depth	120 mm
net weight	0.2 kg
fastening method	S7-300 rack
wire length for RS 422 interface maximum	1 000 m



## Technical specifications

Article number	<b>6GT2002-0GA10</b>
product type designation	ASM 475 communication module
<b>product features, product functions, product components general</b>	
display version	4 LEDs per reader connection, 2 LEDs for device status
product function addressable transponder file handler	Yes
protocol is supported	
• S7 communication	Yes
<b>product functions management, configuration, engineering</b>	
type of parameterization	Object manager, GSD
type of programming	FB 45, FB 55, FC 56 (FC 45/55 with limited functionality)
type of computer-switched communication	acyclic communication

Article number	<b>6GT2002-0GA10</b>
product type designation	ASM 475 communication module
<b>standards, specifications, approvals</b>	
certificate of suitability	CE, FCC, UL/CSA
<b>accessories</b>	
accessories	Front connector with screw-type or spring-loaded terminals

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 communication

**SIPLUS S7-300 CP 340****Overview****Ordering data****Article No.****SIPLUS S7-300 CP 340 communications module**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

with 1 RS 232C (V.24) interface

**6AG1340-1AH02-2AE0**

with 1 RS 422/485 (X.27) interface

**6AG1340-1CH02-2AE0**

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- The low-cost, complete solution for serial communication over a point-to-point connection
- RS 232C (V.24) and RS 422/485 (X.27)
- Implemented protocols:
  - ASCII
  - 3964 (R) (not for RS 485)
  - Printer driver
- Simple parameterization using tool integrated in STEP 7

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1340-1AH02-2AE0</b>	<b>6AG1340-1CH02-2AE0</b>
Based on	<b>6ES7340-1AH02-0AE0</b> SIPLUS S7-300 CP340 RS232	<b>6ES7340-1CH02-0AE0</b> SIPLUS S7-300 CP340 RS422/485
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

**Technical specifications**

Article number	<b>6AG1340-1AH02-2AE0</b>	<b>6AG1340-1CH02-2AE0</b>
Based on	<b>6ES7340-1AH02-0AE0</b> SIPLUS S7-300 CP340 RS232	<b>6ES7340-1CH02-0AE0</b> SIPLUS S7-300 CP340 RS422/485
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 communication

**SIPLUS S7-300 CP 341****Overview**

- For fast, high-performance serial data exchange via point-to-point coupling
- Two versions with different physical transmission characteristics:
  - RS 232C (V.24),
  - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512, customized protocols (can be reloaded)
- Simple parameter assignment using tool integrated in STEP 7

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Ordering data****Article No.****SIPLUS S7-300 CP 341 communications processor**

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

with RS 232C interface (V.24)

**6AG1341-1AH02-7AE0**

with RS 422/485 (X.27) interface

**6AG1341-1CH02-7AE0****Accessories****Modbus Master V3.1****Task:**

Communication via Modbus protocol with RTU format, SIMATIC S7 as master

**Requirement:**

CP 341 or CP 441-2; STEP 7 V4.02 and higher

**Delivery package:**

Driver program/documentation, English, German, French

Single license

**6ES7870-1AA01-0YA0**

Single license, without software and documentation

**6ES7870-1AA01-0YA1****Modbus Slave V3.1****Task:**

Communication via Modbus protocol with RTU format, SIMATIC S7 as slave

**Requirement:**

CP 341 or CP 441-2; STEP 7 V4.02 and higher

**Delivery package:**

Driver program/documentation, English, German, French

Single license

**6ES7870-1AB01-0YA0**

Single license, without software and documentation

**6ES7870-1AB01-0YA1****Technical specifications**

Article number	<b>6AG1341-1AH02-7AE0</b>	<b>6AG1341-1CH02-7AE0</b>
Based on	<b>6ES7341-1AH02-0AE0</b> SIPLUS S7-300 CP341 RS232C	<b>6ES7341-1CH02-0AE0</b> SIPLUS S7-300 CP341 RS422/485
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Ambient temperature during storage/transportation</b>		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

**Technical specifications**

Article number	<b>6AG1341-1AH02-7AE0</b>	<b>6AG1341-1CH02-7AE0</b>
Based on	<b>6ES7341-1AH02-0AE0</b> SIPLUS S7-300 CP341 RS232C	<b>6ES7341-1CH02-0AE0</b> SIPLUS S7-300 CP341 RS422/485
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

# SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 communication

## SIPLUS CP 342-5

### Overview



DP-M	DP-S	FMS	PG/OP	S7/S5
●	●		●	●

- PROFIBUS DP master or slave with electrical interface for connecting the SIMATIC S7-300 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuring and programming via PROFIBUS
- Cross-network PG communication using S7 routing
- Modules can be replaced without a PG

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS CP 342-5 communications processor

(Extended temperature range and exposure to environmental substances)

Communications processor for electrical connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbps, with electronic manual on CD-ROM

Ambient temperature range  
-25 ... +70 °C

**6AG1342-5DA03-7XE0**

#### Accessories

See SIMATIC CP 342-5 communications processor, page 5/185

### Technical specifications

Article number	<b>6AG1342-5DA03-7XE0</b>
Based on product type designation	<b>6GK7342-5DA03-0XE0</b> SIPLUS NET CP 342-5
<b>ambient conditions</b>	
ambient temperature	
• during operation	-25 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity	
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
resistance to chemically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity acc. to EN 60721-3-6	Yes
resistance to mechanically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity acc. to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board acc. to EN 61086	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
type of test of the coating acc. to MIL-I-46058C	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	Yes; Conformal coating, class A
protection class IP	IP20

## Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●			●	●

- Connection for the SIMATIC S7-300 to Industrial Ethernet (not for SINUMERIK)
  - 2 x RJ45 interface for 10/100 Mbps full/half duplex connection (with autosensing for automatic switchover and autocrossover function)
  - Integrated 2-port real-time switch ERTEC
  - Multi-protocol operation with TCP and UDP transport protocol and PROFINET IO
  - Keep Alive function
- Communications services:
  - Open communication (TCP/IP and UDP)
  - PG/OP communication
  - S7 communication (server)
  - PROFINET IO device
- Multicast for UDP
- Remote programming and initial commissioning is possible over Industrial Ethernet
- IT communication
  - Web function
- Integration into network management through SNMP
- Configuration with STEP 7
- Cross-network PG/OP communication by means of S7 routing
- Diagnostics possibilities in STEP 7 and via web browser

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS CP 343-1 Lean communications processor**

For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO device, integral 2-port switch ERTEC, comprehensive diagnostics facilities, module replacement without programming device, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

**6AG1343-1CX10-2XE0****Accessories***Consumables***IE FC RJ45 plug 180**

(extended temperature range and exposure to media)

180° cable outlet

- 1 unit

**6AG1901-1BB10-7AA0****IE FC TP standard cable GP 2 x 2 (type A)**

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

**6XV1840-2AH10****IE FC stripping tool**

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**6GK1901-1GA00***Programming tools***STEP 7 Version 5.7**

See Chapter 12

**STEP 7 Professional V17**

See Chapter 12

**SOFTNET S7 for Industrial Ethernet**

See Industry Mall

Software for S7 and open communication, incl. OPC server, programming device/OP communication, and NCM PC/STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 communication

**SIPLUS S7-300 CP 343-1 Lean****Technical specifications**

Article number	<b>6AG1343-1CX10-2XE0</b>	Article number	<b>6AG1343-1CX10-2XE0</b>
Based on	<b>6GK7343-1CX10-0XE0</b>	Based on	<b>6GK7343-1CX10-0XE0</b>
product type designation	SIPLUS NET CP343-1 LEAN	product type designation	SIPLUS NET CP343-1 LEAN
<b>ambient conditions</b>		resistance to chemically active substances	
ambient temperature			
• for vertical installation during operation	-25 ... +40 °C	• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• for horizontally arranged busbars during operation	-25 ... +60 °C		Yes
• during storage	-40 ... +70 °C	• conformity acc. to EN 60721-3-6	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• during transport	-40 ... +70 °C		Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
installation altitude at height above sea level maximum	5 000 m	resistance to mechanically active substances	
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	• conformity acc. to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
relative humidity		• conformity acc. to EN 60721-3-6	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation		Yes; Class 2 for high availability
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets	coating for equipped printed circuit board acc. to EN 61086	Yes; Protection of the type 1
resistance to biologically active substances		type of coating protection against pollution according to EN 60664-3	Yes; Coating discoloration during service life possible
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request	type of test of the coating acc. to MIL-I-46058C	Yes; Conformal coating, class A
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	
		protection class IP	IP20



## Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●			●	●

- The connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - 2 x RJ45 interface for 10/100 Mbps full/half-duplex connection with autosensing/autonegotiation and autocrossover function
  - Integrated 2-port real-time switch ERTEC
  - Multi-protocol operation with ISO, TCP, UDP transport protocol and PROFINET IO
  - Adjustable keep-alive function

- Communications services:
  - Open communication (ISO, TCP/IP, and UDP)
  - PROFINET IO controller or PROFINET IO device
  - PG/OP communication: Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing)
- Media redundancy (MRP); within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP (V2.2 or higher).
- Multicast for UDP
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- Access protection via configurable access list
- Remote programming and commissioning via Industrial Ethernet
- Configuration with STEP 7
- Automatic setting of CPU clock setting over Ethernet with NTP or SIMATIC procedure
- Web diagnostics
- Integration in network management systems via SNMP (MIB2 diagnostics information)
- Diagnostics possibilities in STEP 7 and via web browser

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

## Article No.

**SIPLUS S7-300 CP 343-1 communications processor**

For connection of SIMATIC S7-300 to Industrial Ethernet over ISO and TCP/IP; PROFINET IO controller or PROFINET IO device, MRP, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through IP access list, initialization over LAN 10/100 Mbps; with electronic manual on DVD

*For industrial applications with extended ambient conditions*

Extended temperature range and exposure to media

**6AG1343-1EX30-7XE0**

**Accessories***Consumables***IE FC RJ45 plug 180**

(extended temperature range and exposure to media)

180° cable outlet

- 1 unit

**6AG1901-1BB10-7AA0**

**C-PLUG**

Removable data storage medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot, -40 ... +70 °C, exposure to media

**6AG1900-0AB00-7AA0**

**IE FC TP standard cable GP 2 x 2 (type A)**

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

**6XV1840-2AH10**

**IE FC stripping tool**

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**6GK1901-1GA00**

# SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 communication

## SIPLUS S7-300 CP 343-1

### Ordering data

### Article No.

### Article No.

*Communication  
within the application*

#### SIPLUS SCALANCE XC-200 Industrial Ethernet Switches

Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager; incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM

Extended temperature range and exposure to media

Switches with PROFINET delivery state

- **SIPLUS SCALANCE XC206-2 (ST/BFOC)**  
with six RJ45 ports 10/100 Mbps and two ST/BFOC ports 100 Mbps

**6AG1206-2BB00-7AC2**

*Programming tools*

**STEP 7 Version 5.7**

See Chapter 12

**STEP 7 Professional V17**

See Chapter 12

**SOFTNET S7 for  
Industrial Ethernet**

See Industry Mall

Software for S7 and open communication, incl. OPC server, programming device/OP communication, and NCM PC/STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A

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### Technical specifications

Article number	<b>6AG1343-1EX30-7XE0</b>
Based on	<b>6GK7343-1EX30-0XE0</b>
product type designation	SIPLUS NET CP 343-1
<b>ambient conditions</b>	
ambient temperature	
• during operation	-25 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity	
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)

Article number	<b>6AG1343-1EX30-7XE0</b>
Based on	<b>6GK7343-1EX30-0XE0</b>
product type designation	SIPLUS NET CP 343-1
resistance to chemically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity acc. to EN 60721-3-6	Yes
resistance to mechanically active substances	
• conformity acc. to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity acc. to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board acc. to EN 61086	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
type of test of the coating acc. to MIL-I-46058C	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	Yes; Conformal coating, class A
protection class IP	IP20

## Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●	●	●	●

- The connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - Multi-protocol operation with TCP and UDP transport protocol
  - Adjustable keep-alive function
- Two separate interfaces (integrated network separation):
  - Gigabit interface with one RJ45 port with 10/100/1 000 Mbps, full/half-duplex with auto-sensing capability
  - PROFINET interface with two RJ45 ports with 10/100 Mbps full/half-duplex with auto-sensing and auto-crossover functionality via integrated 2-port switch
- Communications services via both interfaces:
  - Open communication (TCP/IP and UDP): Multicast with UDP, including routing between both interfaces
  - PG/OP communication:
    - Cross-network by means of S7 routing
    - S7 communication (client, server, multiplexing) including routing between both interfaces
  - IT communication:
    - HTTP communication supports access to process data via own web pages;
    - e-mail client function, sending of e-mails directly from user program;
    - FTP communication supports program-controlled FTP client communication;
    - access to data blocks through FTP server

- Communications services via PROFINET interfaces:
  - PROFINET IO controller and IO device with real-time properties (RT and IRT)<sup>1)</sup>
  - PROFINET CBA
  - IP address assignment via DHCP, simple PC tool or via program block (e.g. for HMI)
  - Configuration with STEP 7
- Media redundancy (MRP); within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP (V2.2 or higher).
- Access protection by means of configurable IP access list
- Module replacement without programming device; all information is stored on the C-PLUG (also file system for IT functions)
- Extensive diagnostic functions for all modules in the rack
- IT communication
  - Web function
  - E-mail function
  - FTP
- Integration into network management systems through the support of SNMP V1 MIB-II

- <sup>1)</sup> possible combinations in parallel operation:
- IO controller with IRT and IO device with RT
  - IO controller with RT and IO device with IRT

### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

## SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 communication

## SIPLUS S7-300 CP 343-1 Advanced

## Ordering data

## Article No.

## Article No.

**SIPLUS S7-300 CP 343-1  
Advanced communications  
processor**

for connecting the SIMATIC S7-300 to Industrial Ethernet, PROFINET IO controller and IO device with RT and IRT, MRP, PROFINET CBA, TCP/IP and UDP, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE with or without RFC 1006, diagnostics extensions, multicast, web server, HTML diagnostics, FTP server, FTP client, email client, CPU clock set via SIMATIC procedure and NTP, access control via IP access list, SNMP, DHCP, initialization over LAN 10/100 Mbps; with electronic manual on DVD; C-PLUG included

*For industrial applications with extended ambient conditions*

Exposure to media

**6AG1343-1GX31-4XE0****Accessories***Consumables***IE FC RJ45 plug 180**

(extended temperature range and exposure to media)

180° cable outlet

- 1 unit

**6AG1901-1BB10-7AA0****C-PLUG****6AG1900-0AB00-7AA0**

Removable data storage medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot, -40 ... +70 °C, exposure to media

**IE FC TP standard cable GP 2 x 2  
(type A)****6XV1840-2AH10**

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

**IE FC TP standard cable GP 4 x 2**

8-wire, shielded TP installation cable for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

- AWG22, for connection to IE FC RJ45 modular outlet
- AWG24, for connecting to IE FC RJ45 Plug 4 x 2, IE FC M12 Plug PRO 4 x 2

**6XV1870-2E****6XV1878-2A****IE FC stripping tool****6GK1901-1GA00**

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

*Communication within the application*

**SIPLUS SCALANCE XC-200  
Industrial Ethernet Switches**

Industrial Ethernet switches with integrated SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager; incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM

Extended temperature range and exposure to media

Switches with PROFINET delivery state

- **SIPLUS SCALANCE XC206-2 (ST/BFOC)** with six RJ45 ports 10/100 Mbps and two ST/BFOC ports 100 Mbps

**6AG1206-2BB00-7AC2**

*Programming tools*

**STEP 7 Version 5.7**

See Chapter 12

**STEP 7 Professional V17**

See Chapter 12

**SOFTNET S7 for  
Industrial Ethernet**

See Industry Mall

Software for S7 and open communication, incl. OPC server, programming device/OP communication, and NCM PC/STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A

**SIMATIC iMap**

See Chapter 12

## Technical specifications

Article number	6AG1343-1GX31-4XE0	Article number	6AG1343-1GX31-4XE0
Based on	6GK7343-1GX31-0XE0	Based on	6GK7343-1GX31-0XE0
product type designation	SIPLUS NET CP343-1 ADVANCED	product type designation	SIPLUS NET CP343-1 ADVANCED
<b>ambient conditions</b>		resistance to chemically active substances	
ambient temperature		• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• for vertical installation during operation	0 ... 40 °C		Yes
• for horizontally arranged busbars during operation	0 ... 60 °C	• conformity acc. to EN 60721-3-6	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• during storage	-40 ... +70 °C		Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• during transport	-40 ... +70 °C	resistance to mechanically active substances	Yes; Class 2 for high availability
installation altitude at height above sea level maximum	5 000 m	• conformity acc. to EN 60721-3-3	Yes; Protection of the type 1
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	• conformity acc. to EN 60721-3-6	Yes; Coating discoloration during service life possible
relative humidity		coating for equipped printed circuit board acc. to EN 61086	Yes; Conformal coating, class A
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation	type of coating protection against pollution according to EN 60664-3	
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets	type of test of the coating acc. to MIL-I-46058C	
resistance to biologically active substances		product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request	protection class IP	IP20
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)		

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 communication

**SIPLUS TIM 3V-IE for WAN and Ethernet****Overview**

- SINAUT communication module SIPLUS TIM for SIMATIC S7-300 for use in a wide area network (WAN)
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data
- Simple configuration and operation without specialist IT knowledge

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS ST7 TIM 3V-IE communication module****6AG1800-3BA00-7AA0**

With an RS 232 interface for SINAUT communication via a conventional WAN or an IP-based network (WAN or LAN)

**Accessories***Consumables***IE FC TP standard cable GP 2 x 2 (Type A)****6XV1840-2AH10**

4-wire, shielded TP installation cable for connection to IE  
FC outlet RJ45/IE FC RJ45 plug;  
PROFINET-compliant;  
with UL approval;  
sold by the meter;  
max. delivery unit 1000 m,  
minimum order quantity 20 m

**IE FC RJ45 plug 180**

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables;  
with 180° cable outlet;  
for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit,  
-40 ... +70 °C, exposure to media

**6AG1901-1BB10-7AA0****IE FC stripping tool****6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables

## Technical specifications

Article number	6AG1800-3BA00-7AA0	Article number	6AG1800-3BA00-7AA0
Based on	6NH7800-3BA00	Based on	6NH7800-3BA00
product type designation	SIPLUS SINAUT ST7, TIM 3V-IE	product type designation	SIPLUS SINAUT ST7, TIM 3V-IE
<b>ambient conditions</b>		resistance to chemically active substances	
ambient temperature		• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• during operation	-25 ... +70 °C		Yes
• during storage	-40 ... +70 °C	• conformity acc. to EN 60721-3-6	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• during transport	-40 ... +70 °C		Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
installation altitude at height above sea level maximum	5 000 m	coating for equipped printed circuit board acc. to EN 61086	Yes; Class 2 for high availability
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
relative humidity		type of test of the coating acc. to MIL-I-46058C	Yes; Coating discoloration during service life possible
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation	product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	Yes; Conformal coating, class A
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets	protection class IP	IP20
resistance to biologically active substances			
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request		
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)		

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 communication

**SIPLUS TIM 4R-IE for WAN and Ethernet****Overview**

- SINAUT communication module SIPLUS TIM with four interfaces for SIMATIC S7-300 or as a self-contained device for S7-400 for use in a wide area network (WAN)
- For universal use in a SINAUT station, node station and control center
- Internet communication via integrated MSC-VPN tunnel with direct connection to DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS ST7 TIM 4R-IE communication module****6AG1800-4BA00-7AA0**

With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)

**Accessories***Consumables***IE FC TP standard cable GP 2 x 2 (Type A)****6XV1840-2AH10**

4-wire, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

**IE FC RJ45 plug 180**

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit; -40 ... +70 °C, exposure to media

**6AG1901-1BB10-7AA0****IE FC stripping tool****6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables



## Technical specifications

Article number	6AG1800-4BA00-7AA0	Article number	6AG1800-4BA00-7AA0
Based on	6NH7800-4BA00	Based on	6NH7800-4BA00
product type designation	SIPLUS SINAUT ST7, TIM 4R-IE	product type designation	SIPLUS SINAUT ST7, TIM 4R-IE
<b>ambient conditions</b>		resistance to chemically active substances	
ambient temperature		• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• during operation	-25 ... +70 °C		Yes
• during storage	-40 ... +70 °C	• conformity acc. to EN 60721-3-6	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• during transport	-40 ... +70 °C		Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
installation altitude at height above sea level maximum	5 000 m	resistance to mechanically active substances	
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	• conformity acc. to EN 60721-3-6	Yes; Class 2 for high availability
relative humidity		coating for equipped printed circuit board acc. to EN 61086	Yes; Protection of the type 1
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/ frost (no commissioning when condensation is present), horizontal installation	type of coating protection against pollution according to EN 60664-3	Yes; Coating discoloration during service life possible
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets	type of test of the coating acc. to MIL-I-46058C	Yes; Conformal coating, class A
resistance to biologically active substances		product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request	protection class IP	IP20
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)		

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 communication

**SIPLUS TIM 3V-IE DNP3****Overview**

In a station for the S7-CPU, the new SIPLUS communication module TIM 3V-IE DNP3 V3.0 (TeleControl Interface Module) handles the data exchange with the assigned master system SIMATIC PCS 7 TeleControl V8.0 using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the S7-300 housing, the module can be fully integrated into the S7-300 system
- The module has an RS232 interface for the connection of an external modem for data transmission via a conventional WAN or the connection of a Modbus RTU slave to an S7-300 system
- The RJ45 port is used for data transmission via IP-based networks

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS TIM 3V-IE DNP3 communication module****6AG1803-3BA00-7AA0**

With an RS232 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)

**Accessories***Consumables***IE FC TP standard cable GP 2 x 2 (Type A)****6XV1840-2AH10**

4-wire, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

**IE FC RJ45 plug 180**

RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- -40 ... +70 °C, exposure to media

**6AG1901-1BB10-7AA0****IE FC stripping tool**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**6GK1901-1GA00**

## Technical specifications

Article number	6AG1803-3BA00-7AA0	Article number	6AG1803-3BA00-7AA0
Based on	6NH7803-3BA00-0AA0	Based on	6NH7803-3BA00-0AA0
product type designation	SIPLUS NET TIM 3V-IE DNP3	product type designation	SIPLUS NET TIM 3V-IE DNP3
<b>ambient conditions</b>		resistance to chemically active substances	
ambient temperature		• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• during operation	-25 ... +70 °C		Yes
• during storage	-40 ... +70 °C	• conformity acc. to EN 60721-3-6	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• during transport	-40 ... +70 °C		Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
installation altitude at height above sea level maximum	5 000 m	coating for equipped printed circuit board acc. to EN 61086	Yes; Class 2 for high availability
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
relative humidity		type of test of the coating acc. to MIL-I-46058C	Yes; Coating discoloration during service life possible
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/ frost (no commissioning when condensation is present), horizontal installation	product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	Yes; Conformal coating, class A
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets	protection class IP	IP20
resistance to biologically active substances			
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request		
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)		

**SIMATIC S7-300 Advanced Controllers**

I/O modules

SIPLUS S7-300 communication

**SIPLUS TIM 4R-IE DNP3****Overview**

In a station for the S7-CPU, the SIPLUS communication module TIM 4R-IE DNP3 (TeleControl Interface Module) handles the data exchange with the assigned SIMATIC PCS7 TeleControl V8.0 master system using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the double-width S7-300 housing, the module can be fully integrated into the S7-300 system
- Can be connected as a stand-alone module to a SIMATIC S7-400 and SIMATIC S7-400 H System
- Two RS232/RS485 interfaces support connection of an external modem for data transmission via a conventional WAN or of a Modbus RTU slave to an S7-300 system
- The module has two RJ45 interfaces for data transmission via IP-based networks
- By using physically separate connection paths, the module permits media redundancy without loss of data during the switchover

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS TIM 4R-IE DNP3 communication module****6AG1803-4BA00-7AA0**

With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)

**Accessories***Consumables***IE FC TP standard cable GP 2 x 2 (Type A)****6XV1840-2AH10**

4-wire, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

**IE FC RJ45 plug 180**

RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- -40 ... +70 °C, exposure to media

**6AG1901-1BB10-7AA0****IE FC stripping tool****6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables

## Technical specifications

Article number	6AG1803-4BA00-7AA0	Article number	6AG1803-4BA00-7AA0
Based on	6NH7803-4BA00-0AA0	Based on	6NH7803-4BA00-0AA0
product type designation	SIPLUS NET TIM 4R-IE DNP3	product type designation	SIPLUS NET TIM 4R-IE DNP3
<b>ambient conditions</b>		resistance to chemically active substances	
ambient temperature		• conformity acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• during operation	-25 ... +70 °C		Yes
• during storage	-40 ... +70 °C	• conformity acc. to EN 60721-3-6	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• during transport	-40 ... +70 °C		Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
installation altitude at height above sea level maximum	5 000 m	coating for equipped printed circuit board acc. to EN 61086	Yes; Class 2 for high availability
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
relative humidity		type of test of the coating acc. to MIL-I-46058C	Yes; Coating discoloration during service life possible
• with condensation acc. to IEC 60068-2-38 maximum	100 %; RH including condensation/ frost (no commissioning when condensation is present), horizontal installation	product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies acc. to IPC-CC-830A	Yes; Conformal coating, class A
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets	protection class IP	IP20
resistance to biologically active substances			
• conformity acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request		
• conformity acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)		

# SIMATIC S7-300 Advanced Controllers

I/O modules

Special modules

## SM 374 simulator

### Overview



- Simulator module for program testing during commissioning and ongoing operation
- For the simulation of sensor signals using switches
- For display of signal conditions on the outputs using LED
- Simulation of
  - 16 inputs or
  - 16 outputs or
  - 8 inputs and 8 outputs
- Function can be directly adjusted on the module using a screwdriver

### Technical specifications

Article number	<b>6ES7374-2XH01-0AA0</b> SM 374 Simulation unit 16E/16A
<b>General information</b>	
Product type designation	SM 374
<b>Input current</b>	
from backplane bus 5 V DC, max.	80 mA
<b>Power loss</b>	
Power loss, typ.	0.35 W
<b>Digital inputs</b>	
Number of digital inputs	16; Switch
<b>Digital outputs</b>	
Number of digital outputs	16; LEDs
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
• between the channels and backplane bus	No
<b>Potential separation digital outputs</b>	
• between the channels and backplane bus	No
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	190 g

### Ordering data

### Article No.

<b>SM 374 simulator module</b> incl. bus connectors, labeling strips	<b>6ES7374-2XH01-0AA0</b>
<b>Bus connectors</b> 1 unit, spare part	<b>6ES7390-0AA00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX00-0AA0</b>
<b>Label cover</b> 10 units (spare part)	<b>6ES7392-2XY00-0AA0</b>
<b>Labeling sheets for machine inscription</b> for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
petrol	<b>6ES7392-2AX00-0AA0</b>
light-beige	<b>6ES7392-2BX00-0AA0</b>
yellow	<b>6ES7392-2CX00-0AA0</b>
red	<b>6ES7392-2DX00-0AA0</b>

## Overview



- Dummy module for reserving slots for non-parameterized signal modules
- Structure and address allocation is retained when replaced with a signal module

## Technical specifications

Article number	<b>6ES7370-0AA01-0AA0</b> DM 370 DUMMY module
<b>General information</b>	
Product type designation	DM 370
<b>Input current</b>	
from backplane bus 5 V DC, max.	5 mA
<b>Power loss</b>	
Power loss, max.	0.03 W
<b>Digital inputs</b>	
Number of digital inputs	0
<b>Digital outputs</b>	
Number of digital outputs	0
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	180 g

## Ordering data

## Article No.

<b>DM 370 dummy module</b> incl. bus connectors, labeling strips	<b>6ES7370-0AA01-0AA0</b>
<b>Bus connectors</b> 1 unit, spare part	<b>6ES7390-0AA00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX00-0AA0</b>
<b>Label cover</b> 10 units (spare part)	<b>6ES7392-2XY00-0AA0</b>
<b>Labeling sheets for machine inscription</b> for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
petrol	<b>6ES7392-2AX00-0AA0</b>
light-beige	<b>6ES7392-2BX00-0AA0</b>
yellow	<b>6ES7392-2CX00-0AA0</b>
red	<b>6ES7392-2DX00-0AA0</b>

# SIMATIC S7-300 Advanced Controllers

I/O modules

SIPLUS S7-300 special modules

## SIPLUS S7-300 DM 370

### Overview



- Dummy module for reserving slots for unconfigured signal modules
- Retention of design and address assignment when replacing with a signal module

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

Article No.	Article No.
<b>SIMATIC S7-300 DM 370 dummy module</b> for use when replacing modules Extended temperature range and exposure to media	<b>6AG1370-0AA01-7AA0</b>
<b>Accessories</b> <i>Consumables</i>	
<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part) For modules with 20-pin front connector	<b>6ES7392-2XX00-0AA0</b>
<b>Label cover</b> 10 units (spare part) For modules with 20-pin front connector	<b>6ES7392-2XY00-0AA0</b>
<b>Labeling sheets for machine printing</b> For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	<b>6ES7392-2AX00-0AA0</b>
Light beige	<b>6ES7392-2BX00-0AA0</b>
Yellow	<b>6ES7392-2CX00-0AA0</b>
Red	<b>6ES7392-2DX00-0AA0</b>

### Technical specifications

Article number	<b>6AG1370-0AA01-7AA0</b>
Based on	<b>6ES7370-0AA01-0AA0</b> SIPLUS S7-300 Dummy module
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!



## Overview



- For the simple and user-friendly connection of sensors and actuators to the S7-300 I/O modules
- For maintaining the wiring when replacing modules ("permanent wiring")
- With mechanical coding to avoid errors when replacing modules

## Ordering data

## Article No.

**Front connectors**

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0  
6ES7392-1AJ00-1AB0

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BJ00-0AA0  
6ES7392-1BJ00-1AB0

40-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AM00-0AA0  
6ES7392-1AM00-1AB0

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BM01-0AA0  
6ES7392-1BM01-1AB0

**Front door, elevated design**

6ES7328-0AA00-7AA0

e.g. for 32 channel modules;  
enables connection of  
1.3 mm<sup>2</sup>/16 AWG wires

**Front door, higher version,  
for F-modules**

6ES7328-7AA10-0AA0

For F-modules; for connecting  
1.3 mm<sup>2</sup>/16 AWG wires; wiring  
diagram and labels in yellow

## SIMATIC S7-300 Advanced Controllers

I/O modules

Connection system

### System cabling for SIMATIC S7-300 and ET 200M

#### Overview



Wiring of SIMATIC S7 I/O modules with the sensors/actuators is a significant factor with respect to time/cost overhead, configuring, control cabinet installation, procurement and ease of service.

With SIMATIC TOP connect system cabling, it is simple and quick to establish a reliable connection for your SIMATIC S7-300 or ET 200M.

With the TIA Selection Tool, a mouse click is all that is required to configure the connection from the SIMATIC S7 module to the I/O. The program automatically checks for plausibility and generates a parts list for the selected connection components that can then be ordered in the Industry Mall.

More information can be found on the Internet at

<http://www.siemens.com/tia-selection-tool>

#### Design

Two cabling variants are available for a wide range of control cabinet concepts:

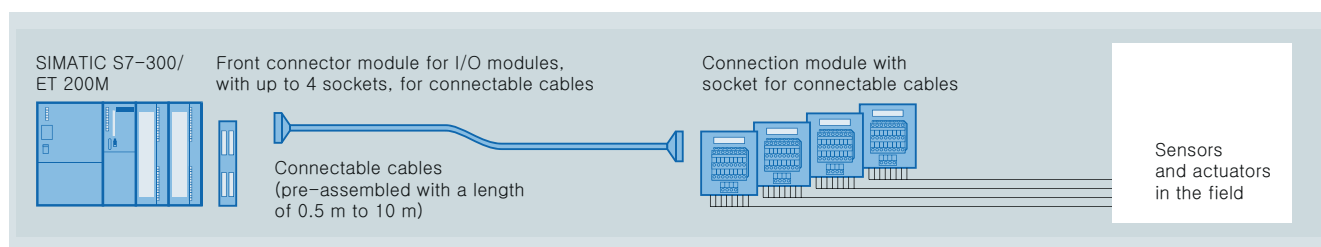
##### Fully modular connection

Each component is individually inserted.

The system consists of:

- Front connector module
- Connecting cable
- Terminal modules in the following versions: basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is minimized. Systematic connection of the SIMATIC system. The assembly work for the connecting cables is drastically reduced thanks to the use of pre-assembled cables sold by the meter.



SIMATIC TOP connect for S7-300/ET200M, fully modular connection

##### Flexible connection

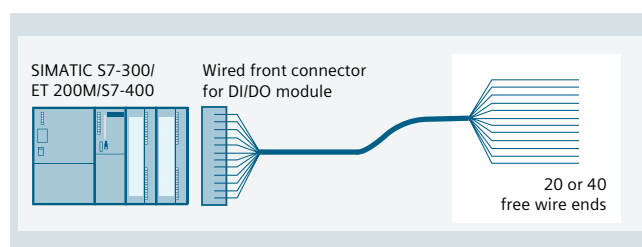
Consisting of:

- Front connector with screw-type or crimp connection
- Front connector with fixed single cores
- Single cores also available with UL/CSA-certified cores

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50% for assembly, since the single cores that have already been checked on the connector are fixed.

This eliminates the time-consuming assembly of up to 40 individual wires per module.



SIMATIC TOP connect for S7-300/ET200M, flexible connection

## Overview



The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-300 or ET 200M consists of modified front connectors, called front connector modules, preassembled connecting cables of various lengths, and terminal modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The terminal modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

## Benefits

- Front connector module, connecting cable and terminal module are easy to plug in
- Fast, low-cost wiring
- For digital and analog signals, supply voltage can be connected to the front plug-in module or terminal module
- Reduction in wiring errors, clear control cabinet wiring
- Distribution of digital signals by byte or quadruple byte
- Each component can be replaced individually
- Pre-assembled cables can be used in different lengths

## Design

### Front connector module

Modified front connectors, called front connector modules, are available for connecting to the module. These are plugged into the module to be wired instead of the front connector. Many different front connector module versions, for digital I/O modules, 24 V 2-ampère modules or analog I/O modules. The connecting cables are plugged into these front connector modules.

### Connecting cable

There are different versions of the connecting cable.

As a pre-assembled 16-pin or 50-pin round cable (shielded or unshielded) it is available in lengths up to 10 m.

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The connecting cable connects the front connector module with the terminal module.

### Terminal module

The system has both digital and analog terminal modules for connecting the I/O signals. These are snapped onto the DIN rail. The terminal modules with basic or signal functionality are available in 1-byte or 4-byte versions.

Terminal modules are available for two different connection methods: with push-in or screw-type terminals. The potential can be fed in at the terminal module or at the front connector module.

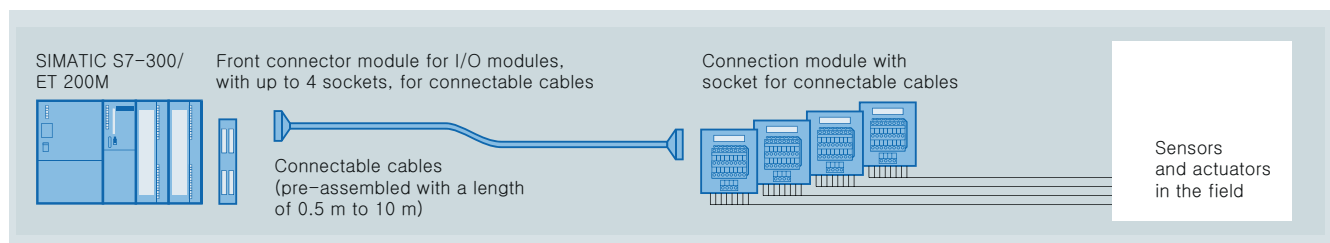
If other voltage or power levels are required in the field, the terminal module for TPRo or TPOo output signals is used. For the TPRo terminal module, relays are used for the implementation. For the TPOo terminal module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC or 110 V AC input signals have to be transmitted to the controller in the field, a terminal module with relay TPRi is available that simply converts the 230/110 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

### Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay terminal module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency.

### Shield plate

The shield plate is latched onto the terminal module for 3-core initiators or optionally onto the terminal module for analog signals and then snapped onto the DIN rail with the terminal module. With the shield connection clamps, optimal shield connection is achieved between the shielded round-sheath ribbon cable or the shielded field cables and the grounded DIN rail.



SIMATIC TOP connect for S7-300/ ET200 M, fully modular connection

# SIMATIC S7-300 Advanced Controllers

I/O modules

Connection system

## System cabling for SIMATIC S7-300 and ET 200M > Fully modular connection

### Technical specifications Front connector

#### Technical data of front connector module

Rated operating voltage	24 VDC
Max. permissible operating voltage	60 V DC
Max. permissible continuous current • per connector pin	1 A
Max. permissible summation current	4 A/byte
Permissible ambient temperature	0 to +60°C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Air gaps and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2

#### Wiring rules for front connector modules

#### Front connector module SIMATIC TOP connect, connection for potential infeed

	Spring connection	Screw connection
<b>Modules up to 4 connections</b>		
Connectable cable cross-sections	No	
• solid cables	0,25 to 1.5 mm <sup>2</sup>	
• flexible cables with/without wire end ferrule		
Number of wires per connection	1 or a combination of 2 conductors up to 1.5 mm <sup>2</sup> (total) in a common wire end ferrule	
Max. diameter of the cable insulation	3.1 mm	
Stripping length of the cables		
• without insulating collar	6 mm	
• with insulating collar	-	
Wire-end ferrules in acc. with DIN 46228		
• without insulating collar	Form A; 5 to 7 mm long	
• with insulating collar 0.25 to 1.0 mm <sup>2</sup>	-	
• with insulating collar 1.5 mm <sup>2</sup>	-	
Blade width of the screwdriver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

#### Front connector module SIMATIC TOP connect, connection for potential infeed

	Spring connection	Screw connection
<b>Modules up to 8 connections</b>		
Connectable cable cross-sections	No	
• solid cables	0.25 to 0.75 mm <sup>2</sup>	
• flexible cables with/without wire end ferrule		
Number of cables per connection	1 or a combination of 2 wires up to 0.75 mm <sup>2</sup> (total) in a common wire end ferrule	
Max. diameter of the cable insulation	2.0 mm	
Stripping length of the cables		
• without insulating collar	6 mm	
• with insulating collar	-	
Wire-end ferrules in acc. with DIN 46228		
• without insulating collar	Form A; 5 to 7 mm long	
• with insulating collar 0.25 to 1.0 mm <sup>2</sup>	-	
• with insulating collar 1.5 mm <sup>2</sup>	-	
Blade width of the screwdriver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

### Technical specifications Connecting cable

#### Technical specifications of connecting cable from SIMATIC S7 to connection module

Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. total current	4 A/byte
Operating temperature	0 to +60 °C
Outer diameter of pre-assembled round cable in mm unshielded/shielded (16-pole)	Approx. 6.5/7.0

**Ordering data**  
**Front connector modules <sup>1)</sup>**

Ordering data	Article No.
<b>Front connector module (compact CPU 312C)</b> Power supply via • Screw terminals	6ES7921-3AK20-0AA0
<b>Front connector module (compact CPU 313C/314C-2PtP/314C-2DP), slot X1</b> Power supply via • Screw terminals	6ES7921-3AM20-0AA0
<b>Front connector module (digital 2 x 8 I/O)</b> Power supply via • Spring-loaded terminals • Screw terminals	6ES7921-3AA00-0AA0 6ES7921-3AB00-0AA0
<b>Front connector module (digital 4 x 8 I/O)</b> Power supply via • Spring-loaded terminals • Screw terminals	6ES7921-3AA20-0AA0 6ES7921-3AB20-0AA0

Ordering data	Article No.
<b>Front connector module (1 x 8 outputs) for 2-ampere digital outputs</b> Power supply via • Spring-loaded terminals • Screw terminals	6ES7921-3AC00-0AA0 6ES7921-3AD00-0AA0
<b>Front connector module 20-pin (analog)</b> Power supply via • Spring-loaded terminals • Screw terminals	6ES7921-3AF00-0AA0 6ES7921-3AG00-0AA0
<b>Front connector module 40-pin (analog)</b> Power supply via • Spring-loaded terminals • Screw terminals	6ES7921-3AF20-0AA0 6ES7921-3AG20-0AA0

<sup>1)</sup> The terminal assignments of these front connector modules are unambiguous, so dimension drawings can be omitted. The dimension drawings for these front connector modules can be found under "Wiring of S7-300 analog modules" in the Industry Mall.

**Connecting cables**

Connecting cables for SIMATIC S7-300	Article No.
<b>Pre-assembled round cable</b> 16-pin, 0.14 mm <sup>2</sup>	
Unshielded	
• 0.5 m	6ES7923-0BA50-0CB0
• 1.0 m	6ES7923-0BB00-0CB0
• 1.5 m	6ES7923-0BB50-0CB0
• 2.0 m	6ES7923-0BC00-0CB0
• 2.5 m	6ES7923-0BC50-0CB0
• 3.0 m	6ES7923-0BD00-0CB0
• 4.0 m	6ES7923-0BE00-0CB0
• 5.0 m	6ES7923-0BF00-0CB0
• 6.5 m	6ES7923-0BG50-0CB0
• 8.0 m	6ES7923-0BJ00-0CB0
• 10.0 m	6ES7923-0CB00-0CB0
Shielded	
• 1.0 m	6ES7923-0BB00-0DB0
• 2.0 m	6ES7923-0BC00-0DB0
• 2.5 m	6ES7923-0BC50-0DB0
• 3.0 m	6ES7923-0BD00-0DB0
• 4.0 m	6ES7923-0BE00-0DB0
• 5.0 m	6ES7923-0BF00-0DB0
• 6.5 m	6ES7923-0BG50-0DB0
• 8.0 m	6ES7923-0BJ00-0DB0
• 10.0 m	6ES7923-0CB00-0DB0

Version 4 x 16 to 1 x 50-pin,  
0.14 mm<sup>2</sup>

Unshielded

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-5BA50-0EB0  
6ES7923-5BB00-0EB0  
6ES7923-5BB50-0EB0  
6ES7923-5BC00-0EB0  
6ES7923-5BC50-0EB0  
6ES7923-5BD00-0EB0  
6ES7923-5BE00-0EB0  
6ES7923-5BF00-0EB0  
6ES7923-5BG50-0EB0  
6ES7923-5BJ00-0EB0  
6ES7923-5CB00-0EB0

## SIMATIC S7-300 Advanced Controllers

I/O modules

Connection system

## System cabling for SIMATIC S7-300 and ET 200M &gt; Fully modular connection

## Ordering data

Article No.

Article No.

## Terminal modules

## Terminal module TP1

For 1-wire connection,  
for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0AA20-0AC0

6ES7924-0AA20-0AA0

6ES7924-0AA20-0BC0

6ES7924-0AA20-0BA0

For 1-wire connection,  
for 50-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-2AA20-0AC0

6ES7924-2AA20-0AA0

6ES7924-2AA20-0BC0

6ES7924-2AA20-0BA0

## Terminal module TP3

For 3-wire connection,  
for 16-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs
- Push-in terminals with LEDs and one isolating terminal per channel
- Screw-type terminals with LEDs and one isolating terminal per channel
- Push-in terminals with LEDs and fuse per channel
- Screw-type terminals with LEDs and one fuse per channel

6ES7924-0CA20-0AC0

6ES7924-0CA20-0AA0

6ES7924-0CA20-0BC0

6ES7924-0CA20-0BA0

6ES7924-0CH20-0BC0

6ES7924-0CH20-0BA0

6ES7924-0CL20-0BC0

6ES7924-0CL20-0BA0

For 3-wire connection,  
for 50-pin connecting cables

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-2CA20-0AC0

6ES7924-2CA20-0AA0

6ES7924-2CA20-0BC0

6ES7924-2CA20-0BA0

## Terminal module TPRo

Relay module for 8 outputs,  
relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BD20-0BC0

6ES7924-0BD20-0BA0

## Terminal module TPRI

Relay module for 8 outputs  
(110 V AC), relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BG20-0BC0

6ES7924-0BG20-0BA0

## Terminal module TPRI

Relay module for 8 outputs  
(230 V AC), relay as normally open contact

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BE20-0BC0

6ES7924-0BE20-0BA0

## Terminal module TPOo

Optocoupler module  
for 8 outputs (max. 24 V DC/4 A)

- Push-in terminals with LEDs
- Screw-type terminals with LEDs

6ES7924-0BF20-0BC0

6ES7924-0BF20-0BA0

## Terminal module for digital output modules 2 A

Terminal module TP2

- Push-in terminals without LEDs
- Screw-type terminals without LEDs

6ES7924-0BB20-0AC0

6ES7924-0BB20-0AA0

## Terminal module for analog modules

Terminal module TPA

- Push-in terminals without LEDs
- Screw-type terminals without LEDs

6ES7924-0CC21-0AC0

6ES7924-0CC21-0AA0

## Accessories

## ID labels for terminal modules in S7-1500 design

ID labels, insertable  
P. unit = 340 units

3RT1900-1SB20

## Shield plate for analog terminal module

P. unit = 4 units (for connection  
of 15-pin connecting cable)

6ES7928-1AA20-4AA0

## Shield connection clamp

For shield plate at SIMATIC end,  
P. unit = 10 units

6ES7590-5BA00-0AA0

For shield plate at field end,  
2 x 2 ... 6 mm

6ES7390-5AB00-0AA0

For shield plate at field end,  
3 ... 8 mm

6ES7390-5BA00-0AA0

For shield plate at field end,  
4 ... 13 mm

6ES7390-5CA00-0AA0

5

## Overview



Flexible connection enables fast, direct connection of the SIMATIC S7-300/ET 200 M input/output modules to the individual elements in the control cabinet.

Attached single cores reduce the wiring outlay.

Wire cross-sections of 0.5 mm<sup>2</sup> allow higher currents, too.

## Technical specifications

Front connector with single cores for 16 channels	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all wires, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	20
Core cross-section	0.5 mm <sup>2</sup> ; Cu
Bundle diameter in mm	approx. 15
Core color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw-type or crimp contacts
Front connector with single cores for 32 channels	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all wires, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	40
Core cross-section	0.5 mm <sup>2</sup> ; Cu
Bundle diameter in mm	approx. 17
Core color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)
Assembly	Screw-type or crimp contacts

## Ordering data

## Article No.

**Front connector with single wires for 16-channel digital modules SIMATIC S7-300, 20 x 0.5 mm<sup>2</sup>**
**Core type H05V-K**Screw version

Packaging unit: 1 unit

Length:

- 2.5 m
- 3.2 m
- 5 m
- Custom lengths

**6ES7922-3BC50-0AB0**  
**6ES7922-3BD20-0AB0**  
**6ES7922-3BF00-0AB0**  
 On request

Packaging unit: 5 units

Length:

- 2.5 m
- 3.2 m
- 5.0 m

**6ES7922-3BC50-5AB0**  
**6ES7922-3BD20-5AB0**  
**6ES7922-3BF00-5AB0**

Crimp version

Packaging unit: 1 unit

Length:

- 2.5 m
- 3.2 m
- 5.0 m
- Custom lengths

**6ES7922-3BC50-0AF0**  
**6ES7922-3BD20-0AF0**  
**6ES7922-3BF00-0AF0**  
 On request

**Core type UL/CSA-certified**Screw version

Packaging unit: 1 unit

Length:

- 3.2 m
- 5.0 m

**6ES7922-3BD20-0UB0**  
**6ES7922-3BF00-0UB0**

**Front connector with single wires for 32-channel digital modules SIMATIC S7-300, 40 x 0.5 mm<sup>2</sup>**
**Core type H05V-K**Screw version

Packaging unit: 1 unit

Length:

- 2.5 m
- 3.2 m
- 5.0 m
- Custom lengths

**6ES7922-3BC50-0AC0**  
**6ES7922-3BD20-0AC0**  
**6ES7922-3BF00-0AC0**  
 On request

Packaging unit: 5 units

Length:

- 2.5 m
- 3.2 m
- 5.0 m

**6ES7922-3BC50-5AC0**  
**6ES7922-3BD20-5AC0**  
**6ES7922-3BF00-5AC0**

Crimp version

Packaging unit: 1 unit

Length:

- 2.5 m
- 3.2 m
- 5.0 m
- Custom lengths

**6ES7922-3BC50-0AG0**  
**6ES7922-3BD20-0AG0**  
**6ES7922-3BF00-0AG0**  
 On request

**Core type UL/CSA-certified**Screw version

Packaging unit: 1 unit

Length:

- 3.2 m
- 5.0 m

**6ES7922-3BD20-0UC0**  
**6ES7922-3BF00-0UC0**

**SIMATIC S7-300 Advanced Controllers**

I/O modules

Connection system

**System cabling for SIMATIC S7-300 and ET 200M > Front connectors with crimp connections****Design*****The front connector is available in two versions:***The 20-pin front connector comprises:

- 20 crimp contact connections for the wiring
- Strain relief for the cables
- Unlocking button for unlatching the front connector when replacing the module
- Receptacle for coding element attachment; there are two coding elements with attachments on the module. The attachments latch into the front connector when inserted for the first time.

The 40-pin front connector comprises:

- 40 crimp contact connections for the wiring
- Strain relief for the cables
- Locking screw for fixing and detaching the front connector when the module is replaced
- Receptacle for coding element attachment; there is one two coding element with attachment on the module. The attachment latches into the front connector when inserted for the first time.

**Integration**Use of the 20-pole front connector with

- 16-channel signal modules
- Function modules
- CPU 312 IFM

Use of the 40-pole front connector with

- 32-channel signal modules
- Compact CPUs

**Ordering data****Article No.****Front connector 20-pin, crimp version without crimp contacts**

Packing unit 100 units

**6ES7921-3AH00-1AA0****Front connector 40-pin, crimp version without crimp contacts**

Packing unit 100 units

**6ES7921-3AH20-1AA0****Accessories****Crimp contacts for front connectors**

Packing unit 250 units

**6XX3070****Crimping tool**

For crimping the crimp contacts

**6XX3071****Unlocking tool for crimp contacts****6ES5497-4UC11**



# SIMATIC S7-300 Advanced Controllers

## Power supplies

1-phase, DC 24 V (for S7-300 and ET200M)

### Overview



The design and functionality of the SIMATIC PS307 single-phase load power supply (system and load current supply) with automatic range switching of the input voltage are an optimal match to the SIMATIC S7-300 PLC. The supply to the CPU is quickly established by means of the connecting comb that is supplied with the system and load current supply. It is also possible to provide a 24 V supply to other S7-300 system components, input/output circuits of the input/output modules and, if necessary, the sensors and actuators. Comprehensive certifications such as UL and GL enable universal use (does not apply to outdoor use).

### Ordering data

### Article No.

<b>PS307 load current supply, 2 A</b> incl. connecting comb Input: 120/230 V AC Output: 24 V DC/2 A	<b>6ES7307-1BA01-0AA0</b>
<b>SIMATIC S7-300 Outdoor, 2 A</b> Stabilized power supply PS305 Input: 24 ... 110 V DC Output: 24 V DC/2 A	<b>6ES7305-1BA80-0AA0</b>
<b>PS307 load current supply, 5 A</b> incl. connecting comb Input: 120/230 V AC Output: 24 V DC/5 A	<b>6ES7307-1EA01-0AA0</b>
<b>SIMATIC S7-300 Outdoor, 5 A</b> Stabilized power supply PS307 Input: 120/230 V AC Output: 24 V DC/5 A	<b>6ES7307-1EA80-0AA0</b>
<b>PS307 load current supply, 10 A</b> Input: 120/230 V AC Output: 24 V DC/10 A	<b>6ES7307-1KA02-0AA0</b>
<b>Accessories</b>	
<b>SIMATIC S7-300 mounting adapter</b> For snapping the new PS307 onto a 35 mm DIN rail (EN 60715) Spare part	<b>6EP1971-1BA00</b>
<b>SIMATIC S7-300 mounting adapter</b> For snapping the PS307 onto a 35 mm DIN rail	<b>6ES7390-6BA00-0AA0</b>

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### Technical specifications

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
<b>Input</b>					
Input	1-phase AC	DC voltage	1-phase AC	1-phase AC	1-phase AC
• Note	Automatic range selection		Automatic range selection	Set by means of selector switch on the device	Automatic range selection
supply voltage					
• 1 at AC rated value	120 V		120 V	120 V	120 V
• 2 at AC rated value	230 V		230 V	230 V	230 V
• at DC		24 ... 110 V			
input voltage					
• 1 at AC	85 ... 132 V		85 ... 132 V	93 ... 132 V	85 ... 132 V
• 2 at AC	170 ... 264 V		170 ... 264 V	187 ... 264 V	170 ... 264 V
• at DC		16.8 ... 138 V			
Wide-range input	No	Yes	No	No	No
Overvoltage resistance	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$	154 V; 0.1 s	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$
Mains buffering	at $V_{in} = 93/187 \text{ V}$	at $V_{in \text{ rated}}$	at $V_{in} = 93/187 \text{ V}$	at $V_{in} = 93/187 \text{ V}$	at $V_{in} = 93/187 \text{ V}$
Mains buffering at $I_{out \text{ rated}}, \text{ min.}$	20 ms; at $V_{in} = 93/187 \text{ V}$	10 ms; at $V_{in \text{ rated}}$	20 ms; at $V_{in} = 93/187 \text{ V}$	20 ms; at $V_{in} = 93/187 \text{ V}$	20 ms; at $V_{in} = 93/187 \text{ V}$
Rated line frequency 1	50 Hz		50 Hz	50 Hz	50 Hz
Rated line frequency 2	60 Hz		60 Hz	60 Hz	60 Hz
Rated line range	47 ... 63 Hz		47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
input current					
• at rated input voltage 120 V	0.9 A		2.3 A	2.1 A	4.2 A
• at rated input voltage 230 V	0.5 A		1.2 A	1.2 A	1.9 A
• at rated input voltage 24 V		2.4 A			
• at rated input voltage 110 V		0.6 A			

# SIMATIC S7-300 Advanced Controllers

## Power supplies

### 1-phase, DC 24 V (for S7-300 and ET200M)

#### Technical specifications

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
Switch-on current limiting (+25 °C), max.	22 A	20 A	20 A	45 A	55 A
duration of inrush current limiting at 25 °C					
• maximum	3 ms	10 ms	3 ms	3 ms	3 ms
$I^2t$ , max.	1 A <sup>2</sup> ·s	5 A <sup>2</sup> ·s	1.2 A <sup>2</sup> ·s	1.8 A <sup>2</sup> ·s	3.3 A <sup>2</sup> ·s
Built-in incoming fuse	T 1.6 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)	T 3,15 A/250 V (not accessible)	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 3 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic C, suitable for DC	Recommended miniature circuit breaker: from 6 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic C or from 6 A characteristic D	Recommended miniature circuit breaker: from 10 A characteristic C
<b>Output</b>					
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	24 V	24 V	24 V	24 V	24 V
• output voltage at output 1 at DC rated value	24 V	24 V	24 V	24 V	24 V
Total tolerance, static ±	3 %	3 %	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %	0.2 %	0.1 %	0.2 %	0.1 %
Static load balancing, approx.	0.2 %	0.4 %	0.5 %	0.4 %	0.5 %
Residual ripple peak-peak, max.	50 mV	150 mV	50 mV	150 mV	50 mV
Residual ripple peak-peak, typ.	5 mV	30 mV	10 mV	40 mV	15 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	150 mV	240 mV	150 mV	240 mV	150 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	20 mV	150 mV	20 mV	90 mV	60 mV
product function output voltage adjustable	No	No	No	No	No
Output voltage setting	-	-	-	-	-
Status display	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	2 s	3 s	2 s	3 s	2 s
Voltage rise, typ.	10 ms	5 ms	10 ms	100 ms	10 ms
Rated current value $I_{out}$ rated	2 A	2 A	5 A	5 A	10 A
Current range	0 ... 2 A	0 ... 3 A	0 ... 5 A	0 ... 5 A	0 ... 10 A
• Note		3 A up to +60°C at $V_{in} > 24$ V			
supplied active power typical	48 W	48 W	120 W	120 W	240 W
short-term overload current					
• on short-circuiting during the start-up typical	9 A	9 A	20 A	20 A	38 A
• at short-circuit during operation typical	9 A	9 A	20 A	20 A	38 A
duration of overloading capability for excess current					
• on short-circuiting during the start-up	90 ms	270 ms	100 ms	180 ms	80 ms
• at short-circuit during operation	90 ms	270 ms	100 ms	80 ms	80 ms
Parallel switching for enhanced performance	Yes	Yes	Yes	No	Yes
Numbers of parallel switchable units for enhanced performance	2	2			
<b>Efficiency</b>					
Efficiency at $V_{out}$ rated, $I_{out}$ rated, approx.	84 %	75 %	87 %	84 %	90 %
Power loss at $V_{out}$ rated, $I_{out}$ rated, approx.	9 W	16 W	18 W	23 W	27 W

### Technical specifications

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
<b>Closed-loop control</b>					
Dynamic mains compensation ( $V_{in rated} \pm 15\%$ ), max.	0.1 %	0.3 %	0.1 %	0.3 %	0.1 %
Dynamic load smoothing ( $I_{out}: 50/100/50\%$ ), $U_{out} \pm$ typ.	0.8 %	2.5 %	1 %	3 %	2 %
Load step setting time 50 to 100%, typ.	0.5 ms	2.5 ms	0.3 ms	0.2 ms	
Load step setting time 100 to 50%, typ.	0.5 ms	2.5 ms	0.3 ms	0.2 ms	
setting time maximum	1 ms	5 ms		5 ms	0.1 ms
<b>Protection and monitoring</b>					
Output overvoltage protection	Additional control loop, shutdown at < 28.8 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at < 28.8 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at < 28.8 V, automatic restart
Current limitation	2.2 ... 2.6 A	3.3 ... 3.9 A	5.5 ... 6.5 A	5.5 ... 6.5 A	11 ... 12 A
property of the output short-circuit proof	Yes	Yes	Yes	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
enduring short circuit current RMS value					
• maximum	2 A	2 A	7 A	5 A	12 A
Overload/short-circuit indicator	-	-			-
<b>Safety</b>					
Primary/secondary isolation	Yes	Yes	Yes	Yes	Yes
galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra low output voltage $V_{out}$ according to EN 60950-1 and EN 50178, creepage distances and clearances > 5 mm	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra low output voltage $V_{out}$ according to EN 60950-1 and EN 50178, creepage distances and clearances > 5 mm	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I	Class I	Class I
leakage current					
• maximum	3.5 mA		3.5 mA	3.5 mA	3.5 mA
• typical	0.5 mA		0.5 mA	0.3 mA	0.6 mA
Degree of protection (EN 60529)	IP20	IP20	IP20	IP20	IP20
<b>Approvals</b>					
CE mark	Yes	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	UL-Listed (UL 508), File E143289, CSA (CSA C22.2 No. 142)	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	UL-Listed (UL 508), File E143289, CSA (CSA C22.2 No. 142)	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	ATEX (EX) II 3G Ex nA II T4; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	-	ATEX (EX) II 3G Ex nA II T4; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	-	ATEX (EX) II 3G Ex nA II T4; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455
certificate of suitability NEC Class 2	No	No	No	No	No
FM approval	Class I, Div. 2, Group ABCD, T4	-	Class I, Div. 2, Group ABCD, T4	-	Class I, Div. 2, Group ABCD, T4
CB approval	No	No	No	No	No
certificate of suitability EAC approval	Yes	Yes	Yes	Yes	Yes
Marine approval	In S7-300 system	-	In S7-300 system	-	In S7-300 system
<b>EMC</b>					
Emitted interference	EN 55022 Class B	EN 55011 Class A	EN 55022 Class B	EN 55011 Class A	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable	EN 61000-3-2	-	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2

# SIMATIC S7-300 Advanced Controllers

## Power supplies

### 1-phase, DC 24 V (for S7-300 and ET200M)

#### Technical specifications

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
<b>environmental conditions</b>					
ambient temperature					
• during operation	0 ... 60 °C	-25 ... +70 °C	0 ... 60 °C	-25 ... +70 °C	0 ... 60 °C
- Note	with natural convection	with natural convection	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K5, transient condensation permitted	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K5, transient condensation permitted	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>					
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals
Connections					
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L+, M1, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	L+, M: 4 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-	-	-	-
width of the enclosure	40 mm	80 mm	60 mm	80 mm	80 mm
height of the enclosure	125 mm	125 mm	125 mm	125 mm	125 mm
depth of the enclosure	120 mm	120 mm	120 mm	120 mm	120 mm
required spacing					
• top	40 mm	50 mm	40 mm	50 mm	40 mm
• bottom	40 mm	50 mm	40 mm	50 mm	40 mm
• left	0 mm	0 mm	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm	0 mm	0 mm
Weight, approx.	0.4 kg	0.57 kg	0.6 kg	0.57 kg	0.8 kg
product feature of the enclosure housing can be lined up	Yes	Yes	Yes	Yes	Yes
Installation	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail
mechanical accessories	Mounting adapter for standard mounting rail (6EP1971-1BA00)	Mounting adapter for standard mounting rail (6ES7390-6BA00-0AA0)	Mounting adapter for standard mounting rail (6EP1971-1BA00)	Mounting adapter for standard mounting rail (6ES7390-6BA00-0AA0)	Mounting adapter for standard mounting rail (6EP1971-1BA00)
MTBF at 40 °C	2 320 078 h	964 506 h	2 480 589 h	2 231 610 h	1 504 280 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

# SIMATIC S7-300 Advanced Controllers

## SIPLUS power supplies

1-phase, 24 V DC (for S7-300 and ET200M)

### Overview



The design and functionality of the SIPLUS PS 305 and PS 307 1-phase load power supplies (system and load current supply) with automatic range switchover of the input voltage are an optimal match for the SIMATIC S7-300 in design and functionality. By means of the connecting comb that is supplied with the system and load current supply, the supply to the CPU is quickly established. It is also possible to provide a 24 V supply to other S7-300 system components, input/output circuits of the input/output modules and, if necessary, the sensors and actuators. Comprehensive certifications, such as UL, ATEX or GL facilitate universal use (does not apply to outdoor use).

### Note

SIPLUS extreme products are based on Siemens standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS power supplies

*For industrial applications with extended ambient conditions*

#### SIPLUS S7-300 PS 305

**6AG1305-1BA80-2AA0**

(Extended temperature range and exposure to media)

Input: 24 ... 110 V DC  
Output: 24 V DC/2 A

#### SIPLUS S7-300 PS 307 5 A

**6AG1307-1EA01-7AA0**

(Extended temperature range and exposure to media)

Incl. connection bracket  
120/230 V AC; 24 V DC  
Output current 5 A  
(dimensions 60 x 125 x 120)

#### SIPLUS S7-300 PS 307 10 A

**6AG1307-1KA02-7AA0**

(Extended temperature range and exposure to media)

Incl. connection bracket  
120/230 V AC; 24 V DC  
Output current 10 A  
(dimensions 80 x 125 x 120)

*For rolling stock railway applications*

#### SIPLUS S7-300 PS 305

**6AG1305-1BA80-2AA0**

(Extended temperature range and exposure to media)

Conforms to EN 50155

Input: 24 ... 110 V DC  
Output: 24 V DC/2 A

#### Accessories

#### SIMATIC S7-300 mounting adapter

**6EP1971-1BA00**

For snapping the PS 307 onto a 35 mm DIN rail (EN 60715)

#### Spare part

SIMATIC S7-300 mounting adapter; for snapping the PS 307 onto 35 mm standard rails

**6ES7390-6BA00-0AA0**

# SIMATIC S7-300 Advanced Controllers

## SIPLUS power supplies

### 1-phase, 24 V DC (for S7-300 and ET200M)

#### Technical specifications

Article number	<b>6AG1305-1BA80-2AA0</b>	<b>6AG1307-1EA01-7AA0</b>	<b>6AG1307-1KA02-7AA0</b>
Based on	<b>6ES7305-1BA80-0AA0</b> SIPLUS S7-300 PS 305 2 A (EN50155)	<b>6ES7307-1EA01-0AA0</b> SIPLUS PS307 AC 120/230V / DC 24 V/5 A	<b>6ES7307-1KA02-0AA0</b> SIPLUS_PS307_10A
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-25 °C; = Tmin 70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/UL hazardous use applies	-25 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	-25 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	2 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 75 V DC	2 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 75 V DC	2 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 75 V DC
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request  Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 3S4 incl. sand, dust, *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-5</li> <li>to chemically active substances according to EN 60721-3-5</li> <li>to mechanically active substances according to EN 60721-3-5</li> </ul>	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request  Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *  Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request  Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *  Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request  Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *  Yes; Class 5S3 incl. sand, dust; *
<b>Use on ships/at sea</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>			
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

# SIMATIC S7-300 Advanced Controllers

## Interface modules

### IM 360/361/365 interface modules

#### Overview



- For connection of the SIMATIC S7-300 rack in multi-tier configurations
- IM 365:  
For configuring central controllers and max. 1 expansion unit.  
Limited use of modules in the expansion unit (e.g. no CPs and FMs)
- IM 360/IM 361:  
For configuring central controllers and max. 3 expansion units.  
Unlimited selection of modules in the expansion unit

#### Ordering data

#### Article No.

##### IM 360 interface module

For expanding the S7-300 with max. 3 EUs; can be plugged into the CC

6ES7360-3AA01-0AA0

##### IM 361 interface module

For expanding the S7-300 with max. 3 EUs; can be plugged into the EU

6ES7361-3CA01-0AA0

##### Connecting cable

Between IM 360 and IM 361 or IM 361 and IM 361

1 m

6ES7368-3BB01-0AA0

2.5 m

6ES7368-3BC51-0AA0

5 m

6ES7368-3BF01-0AA0

10 m

6ES7368-3CB01-0AA0

##### IM 365 interface module

For expanding the S7-300 with max. 1 EU; 2 modules with permanent connecting cable (1 m)

6ES7365-0BA01-0AA0

##### SIMATIC Manual Collection

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC software, SIMATIC TDC

6ES7998-8XC01-8YE0

##### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7998-8XC01-8YE2

#### Technical specifications

Article number	6ES7360-3AA01-0AA0	6ES7361-3CA01-0AA0	6ES7365-0BA01-0AA0
	Interf. mod. IM360 in CC, with K-BUS	IM 361 Interface Module in ER, with K-Bus	Interf. mod. IM365, w/o K-BUS
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC		Yes	
<b>Input current</b>			
from supply voltage L+, max.		500 mA	
from backplane bus 5 V DC, max.	350 mA		100 mA
<b>Power loss</b>			
Power loss, typ.	2 W	5 W	0.5 W
<b>Hardware configuration</b>			
Number of interfaces per CPU, max.	1	3	1; 1 pair
<b>Dimensions</b>			
Width	40 mm	80 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	225 g	505 g	580 g

## SIMATIC S7-300 Advanced Controllers

### SIPLUS interface modules

#### SIPLUS S7-300 IM 365

#### Overview



- SIPLUS IM 365:  
For configuration of 1 central controller and max. 1 expansion unit

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

#### Ordering data

##### SIPLUS S7-300 IM 365 interface module

For expansion of S7-300 with max. 1 EU; 2 modules with permanent connecting cable (1 m)

Extended temperature range and exposure to media

#### Article No.

**6AG1365-0BA01-2AA0**

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#### Technical specifications

Article number	<b>6AG1365-0BA01-2AA0</b>
Based on	<b>6ES7365-0BA01-0AA0</b> SIPLUS S7-300 IM365
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa // (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1365-0BA01-2AA0</b>
Based on	<b>6ES7365-0BA01-0AA0</b> SIPLUS S7-300 IM365
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>	
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!



### Overview DIN rail



- The mechanical rack for SIMATIC S7-300
- For accommodating the modules
- Can be attached to walls

### Ordering data

### Article No.

#### DIN rail

160 mm	6ES7390-1AB60-0AA0
482 mm	6ES7390-1AE80-0AA0
530 mm	6ES7390-1AF30-0AA0
830 mm	6ES7390-1AJ30-0AA0
2000 mm	6ES7390-1BC00-0AA0

### Overview Labeling sheets

#### Labeling sheets

- Film sheets for the application-specific labeling of SIMATIC S7-300 I/O modules using standard laser printers
- Plain color films, tear-resistant, dirt-repellent
- Simple handling:
  - perforated label sheets in DIN A4 format for easy separation of the labeling strips.
  - the separated strips can be attached directly onto the I/O modules.
- Different colors to distinguish between different module types or preferred applications:  
The labeling sheets are available in the following colors: petrol, light-beige, red, and yellow. Yellow is reserved for fail-safe systems.

#### Label cover

- Petrol-colored film
- For sealing and fixing of custom labeling strips on normal paper
- Accessories, 10 units

### Ordering data

### Article No.

#### Label sheets

for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol	6ES7392-2AX00-0AA0
light-beige	6ES7392-2BX00-0AA0
yellow	6ES7392-2CX00-0AA0
red	6ES7392-2DX00-0AA0

for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol	6ES7392-2AX10-0AA0
light-beige	6ES7392-2BX10-0AA0
yellow	6ES7392-2CX10-0AA0
red	6ES7392-2DX10-0AA0

### Technical specifications

#### Labeling sheets for S7-300

Dimensions	DIN A4
Labeling strips per sheet, pre-perforated	10
Weight, approx.	0.1 kg

## SIMATIC S7-300 Advanced Controllers

### Notes

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## SIMATIC S7-400 Advanced Controllers



6/2

6/2

6/5

### Overview

SIMATIC S7-400

I/O modules

# SIMATIC S7-400 Advanced Controllers

## Overview

### SIMATIC S7-400

#### Overview

**SIMATIC S7-400:**  
**The powerful controller for system solutions in the manufacturing and process industries**

Within the controller family, the SIMATIC S7-400 is designed for system solutions in the manufacturing and process automation industry.

- The modularly designed S7-400H can be flexibly adapted to your requirements. The redundant configuration further increases system availability.
- An additional protective coating (conformal coating) on the circuit board optimally protects the modules against external influences and makes them durable.
- The S7-400H stands out thanks to its long-term availability.
- Safety engineering, SIMATIC F-systems and standard automation can be integrated into a single automation system.
- The configuration of the distributed I/O of the S7-400 can be modified during operation. In addition signal modules can be removed and inserted while live (hot swapping). This makes it very easy to expand the system or replace modules in the event of a fault.
- Storage of the entire project data, including symbols and comments, on the CPU simplifies service and maintenance calls.



SIMATIC S7-400, CPU	412-5H <sup>4)</sup>	414-5H <sup>4)</sup>	416-5H <sup>4)</sup>	417-5H <sup>4)</sup>
<b>Work memory</b>	1 MB	4 MB	16 MB	32 MB
<b>Processing times (ns)</b>				
Bit/word/ fixed point/floating point	31.25/31.25/ 31.25/62.5	18.75/18.75/ 18.75/37.5	12.5/12.5/ 12.5/25	7.5/7.5/ 7.5/15
<b>Timers/counters</b>	2048/2048	2048/2048	2048/2048	2048/2048
<b>Address ranges</b>				
Digital inputs/outputs	65536 each	65536 each	131072 each	131072 each
Analog inputs/outputs	4096 each	4096 each	8192 each	8192 each
<b>DP interfaces</b>				
Number of MPI/DP interfaces	1	1	1	1
Number of DP interfaces	1	1	1	1
Number of DP slaves per MPI/DP	32	32	32	32
Number of DP slaves per DP	64	96	125	125
Plug-in interface modules	—	—	—	—
Data set gateway	●	●	●	●
<b>PN interfaces</b>				
Number of PN interfaces	1 (2 ports)	1 (2 ports)	1 (2 ports)	1 (2 ports)
PROFINET IO	●	●	●	●
PROFINET with IRT	—	—	—	—
PROFINET CBA	—	—	—	—
TCP/IP	●	●	●	●
UDP	●	●	●	●
Web server	—	—	—	—
ISO-on-TCP (RFC 1006)	●	●	●	●
<b>Mounting dimensions</b>				
W x H x D (mm)	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219

— = cannot be used/not available  
 ● = can be used/available

<sup>4)</sup> also as SIPLUS extreme component for corrosive atmosphere/condensation

### Overview

- The S7-400 is especially suitable for data-intensive tasks in the process industry. High processing speeds and deterministic response times guarantee short machine cycle times on high-speed machines in the manufacturing industry. The high-speed backplane bus of S7-400 ensures efficient linking of central I/O modules.
- The S7-400 is used preferably to coordinate complete plants and to control lower-level devices/stations; this is guaranteed by the high communication power and the integral interfaces.
- The performance is scalable thanks to a graded range of CPUs; Interfaces for the PROFIBUS/PROFINET connection ensure optimal connectivity.
- To further increase ruggedness and durability in the harsh everyday industrial environment, the S7-400 has a "G3" conformal coating.



SIMATIC S7-400, CPU	412-1 / 412-2	412-2 PN <sup>4)</sup>	414-2 / 414-3	414-3 PN/DP <sup>4)</sup>	416-2 / 416-3 <sup>4)</sup>	416-3 PN/DP <sup>4)</sup>	417-4 <sup>4)</sup>
<b>Work memory</b>	512KB/ 1 <sup>1)</sup> MB	1 MB	2/4 <sup>2)</sup> MB	4 MB	8/16 <sup>3)</sup> MB	16 MB	32 MB
<b>Processing times (ns)</b>							
Bit/word/ fixed point/floating point	31.25/31.25/ 31.25/62.5	31.25/31.25/ 31.25/62.5	18.75/18.75/ 18.75/37.5	18.75/18.75/ 18.75/37.5	12.5/12.5/ 12.5/25	12.5/12.5/ 12.5/25	7.5/7.5/ 7.5/15
<b>Timers/counters</b>	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048
<b>Address range</b>							
Digital inputs/outputs	32768 each	32768 each	65536 each	65536 each	131072 each	131072 each	131072 each
Analog inputs/outputs	2048 each	2048 each	4096 each	4096 each	8192 each	8192 each	8192 each
<b>DP interfaces</b>							
Number of MPI/DP interfaces	1	1	1	1	1	1	1
Number of DP interfaces	— / 1 <sup>1)</sup>	—	1	—	1	1	1
Number of DP slaves per MPI/DP	32	32	32	32	32	32	32
Number of DP slaves per DP	64	—	96 each	125 each	125 each	125 each	125 each
Plug-in interface modules	—	—	— / 1 x DP <sup>2)</sup>	1 x DP	— / 1 x DP <sup>3)</sup>	1 x DP	2 x DP
Data set gateway	●	●	●	●	●	●	●
<b>PN interfaces</b>							
Number of PN interfaces	—	1 (2 ports)	—	1 (2 ports)	—	1 (2 ports)	—
PROFINET IO	—	●	—	●	—	●	—
PROFINET with IRT	—	●	—	●	—	●	—
PROFINET CBA	—	●	—	●	—	●	—
TCP/IP	—	●	—	●	—	●	—
UDP	—	●	—	●	—	●	—
Web server	—	●	—	●	—	●	—
ISO-on-TCP (RFC 1006)	—	●	—	●	—	●	—
<b>Mounting dimensions</b>							
W x H x D (mm)	25 x 290 x 219	25 x 290 x 219	25 x 290 x 219 50 x 290 x 219 <sup>2)</sup>	50 x 290 x 219	25 x 290 x 219 50 x 290 x 219 <sup>3)</sup>	50 x 290 x 219	50 x 290 x 219

— = cannot be used/not available  
● = can be used/available

<sup>1)</sup> CPU 412-2

<sup>2)</sup> CPU 414-3

<sup>3)</sup> CPU 416-3

<sup>4)</sup> also as SIPLUS extreme component for corrosive atmosphere/condensation

# SIMATIC S7-400 Advanced Controllers

## Overview

### SIMATIC S7-400

#### Overview

- Safety engineering and standard automation can be integrated into a single S7-400;.
- For demanding, safety-oriented automation in mechanical engineering with S7 Distributed Safety.
- Many S7-400 components are also available in a SIPLUS extreme version for extreme environmental conditions, e.g. for use where there is a corrosive atmosphere/condensation. For more detailed information, visit [www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

For more information, refer to:

[www.siemens.com/simatic-s7-400](http://www.siemens.com/simatic-s7-400)

Detailed information on SIMATIC S7-400, see *Catalog ST 400* in the Siemens Industry Online Support:

[www.siemens.com/industry-catalogs](http://www.siemens.com/industry-catalogs)



SIMATIC S7-400, CPU	414F-3 PN/DP	416F-2	416F-3 PN/DP
<b>Work memory</b>	4 MB	8 MB	16 MB
<b>Processing times (ns)</b>			
Bit/word/ fixed point/floating point	18.75/18.75/ 18.75/37.5	12.5/12.5/ 12.5/25	12.5/12.5/ 12.5/25
<b>Timers/counters</b>	2048/2048	2048/2048	2048/2048
<b>Address ranges</b>			
Digital inputs/outputs	65536 each	131072 each	131072 each
Analog inputs/outputs	4096 each	8192 each	8192 each
<b>DP interfaces</b>			
Number of MPI/DP interfaces	1	1	1
Number of DP interfaces	1	1	1
Number of DP slaves per MPI/DP	32	32	32
Number of DP slaves per DP	125 each	125	125 each
Plug-in interface modules	1 x DP	—	1 x DP
Data set gateway	●	●	●
<b>PN interfaces</b>			
Number of PN interfaces	1 (2 ports)	—	1 (2 ports)
PROFINET IO	●	—	●
PROFINET with IRT	●	—	●
PROFINET CBA	●	—	●
TCP/IP	●	—	●
UDP	●	—	●
Web server	●	—	●
ISO-on-TCP (RFC 1006)	●	—	●
<b>Mounting dimensions</b>			
W x H x D (mm)	50 x 290 x 219	25 x 290 x 219	50 x 290 x 219

— = cannot be used/not available

● = can be used/available

### Overview

#### Digital modules

##### SM 421 digital input module

Article No.



- Digital inputs for the SIMATIC S7-400
  - For connecting switches and 2-wire proximity switches (BEROs)
- Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: [www.siemens.com/industry-catalogs](http://www.siemens.com/industry-catalogs)

16 inputs, 24 V DC, with hardware/diagnostics interrupt

32 inputs, 24 V DC

32 inputs, 120 V UC

16 inputs, 120/230 V UC, inputs according to IEC 1131-2 Type 2

16 inputs, 24 to 60 V UC, with hardware/diagnostics interrupt

**6ES7421-7BH01-0AB0**

**6ES7421-1BL01-0AA0**

**6ES7421-1EL00-0AA0**

**6ES7421-1FH20-0AA0**

**6ES7421-7DH00-0AB0**

##### SM 422 digital output module

Article No.



- Digital outputs for the SIMATIC S7-400
  - For connecting solenoid valves, contactors, small-power motors, lamps and motor starters
- Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: [www.siemens.com/industry-catalogs](http://www.siemens.com/industry-catalogs)

16 outputs, 120/230 V AC, 2 A

6 outputs, relay contacts

16 outputs, 24 V DC, 2 A

32 outputs, 24 V DC, 0.5 A

32 outputs; 24 V DC, 0.5 A; with diagnostics

**6ES7422-1FH00-0AA0**

**6ES7422-1HH00-0AA0**

**6ES7422-1BH11-0AA0**

**6ES7422-1BL00-0AA0**

**6ES7422-7BL00-0AB0**

#### Analog modules

##### SM 431 analog input module

Article No.



- Analog inputs for the SIMATIC S7-400
  - For connecting voltage sensors and current sensors, thermocouples, resistors and resistance thermometers
  - Resolution 13 to 16 bit
- Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: [www.siemens.com/industry-catalogs](http://www.siemens.com/industry-catalogs)

16 inputs, non-floating, 13 bit

8 inputs, floating, 14 bit

8 inputs, floating, 13 bit

8 inputs, floating, 14 bit, with linearization

16 inputs, floating, 16 bit, hardware interrupt capability

8 inputs, floating, 16 bit, hardware interrupt capability, for thermocouples (I, U)

8 inputs, floating, 16 bit, hardware interrupt capability, for thermal resistors

**6ES7431-0HH00-0AB0**

**6ES7431-1KF20-0AB0**

**6ES7431-1KF00-0AB0**

**6ES7431-1KF10-0AB0**

**6ES7431-7QH00-0AB0**

**6ES7431-7KF00-0AB0**

**6ES7431-7KF10-0AB0**

##### SM 432 analog output module

Article No.



- Analog outputs for the SIMATIC S7-400
  - For connecting analog actuators
- Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: [www.siemens.com/industry-catalogs](http://www.siemens.com/industry-catalogs)

8 outputs, floating, 13 bit





**6ES7432-1HF00-0AB0**

# SIMATIC S7-400 Advanced Controllers

## Overview

### I/O modules

#### Overview

Function modules			
<b>FM 450-1 counter module</b>			
		Article No.	
	<ul style="list-style-type: none"> <li>Two-channel, intelligent counter module for simple counting tasks</li> <li>For direct connection of incremental encoders</li> <li>Comparison function with 2 definable comparison values</li> <li>Integrated digital outputs for outputting the reaction on reaching the comparison values</li> </ul> <p>Detailed information on SIMATIC S7-400, see <b>Catalog ST 400</b> in Siemens Industry Online Support: <a href="http://www.siemens.com/industry-catalogs">www.siemens.com/industry-catalogs</a></p>	With 2 channels, max. 500 kHz; for incremental encoders	<b>6ES7450-1AP01-0AEO</b>
<b>FM 451 positioning module</b>			
		Article No.	
	<p>The three-channel FM 451 positioning module takes over the adjustment of mechanical axes for rapid traverse/creep speed drives. The module is designed for positioning adjusting and tooling axes, preferably with standard motors, controlled via contactors or frequency converters.</p> <ul style="list-style-type: none"> <li>Three-channel positioning module for rapid traverse/creep speed drives</li> <li>4 digital outputs per channel for motor control</li> <li>Incremental or synchronous-serial position feedback</li> </ul> <p>Detailed information on SIMATIC S7-400, see <b>Catalog ST 400</b> in Siemens Industry Online Support: <a href="http://www.siemens.com/industry-catalogs">www.siemens.com/industry-catalogs</a></p>	For rapid traverse and creep speed drives	<b>6ES7451-3AL00-0AEO</b>
<b>FM 452 cam controller</b>			
		Article No.	
	<ul style="list-style-type: none"> <li>Very high-speed electronic cam controller</li> <li>Low-cost alternative to mechanical cam controllers</li> <li>32 cam tracks, 16 onboard digital outputs for direct output of actions</li> <li>Incremental or synchronous-serial position feedback</li> </ul> <p>Detailed information on SIMATIC S7-400, see <b>Catalog ST 400</b> in Siemens Industry Online Support: <a href="http://www.siemens.com/industry-catalogs">www.siemens.com/industry-catalogs</a></p>		<b>6ES7452-1AH00-0AEO</b>
<b>FM 453 positioning module</b>			
		Article No.	
	<p>The FM 453 is an intelligent, three-channel module designed for a wide range of positioning tasks using servo and/or stepper motors.</p> <ul style="list-style-type: none"> <li>It can be used for simple point-to-point positioning tasks as well as for complex traverse profiles with the most stringent demands for dynamic response, accuracy, and velocity.</li> <li>It is the ideal solution for positioning tasks in machines with high clock rates and for multi-axis machines.</li> <li>Up to 3 independent motors can be controlled</li> </ul> <p>Detailed information on SIMATIC S7-400, see <b>Catalog ST 400</b> in Siemens Industry Online Support: <a href="http://www.siemens.com/industry-catalogs">www.siemens.com/industry-catalogs</a></p>	with 3 channels/axes	<b>6ES7453-3AH00-0AEO</b>



### Overview

#### Function modules

#### FM 455 controller module

Article No.



The FM 455 controller module is the intelligent 16-channel controller module for universal control tasks. It can be used, for example, for temperature control, pressure control, flow control or level control.

- Convenient online self-optimization for temperature controls
- Ready-to-use controller structures
- 2 control algorithms
- 2 versions:
  - FM 455 C as continuous controller
  - FM 455 S as step or pulse controller
- With 16 analog outputs (FM 455 C) or 32 digital outputs (FM 455 S) for actuators

Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support:

[www.siemens.com/industry-catalogs](http://www.siemens.com/industry-catalogs)

With 16 analog outputs for 16 continuous controllers

**6ES7455-0VS00-0AE0**

With 32 digital outputs for 16 step or pulse controllers

**6ES7455-1VS00-0AE0**

## SIMATIC S7-400 Advanced Controllers

### Notes

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## Distributed Controllers



<b>7/2</b>	<b>based on ET 200SP</b>
7/2	<u>Standard CPUs</u>
7/2	CPU 1510SP-1 PN
7/6	CPU 1512SP-1 PN
7/10	<u>SIPLUS standard CPUs</u>
7/10	SIPLUS CPU 1510SP-1 PN
7/12	SIPLUS CPU 1512SP-1 PN
7/14	<u>Fail-safe CPUs</u>
7/14	CPU 1510SP F-1 PN
7/18	CPU 1512SP F-1 PN
7/22	<u>SIPLUS fail-safe CPUs</u>
7/22	SIPLUS CPU 1510SP F-1 PN
7/24	SIPLUS CPU 1512SP F-1 PN
7/26	<u>ET 200SP Open Controllers</u>
7/26	Standard CPUs
7/26	- CPU 1515SP PC2
7/30	Fail-safe CPUs
7/30	- CPU 1515SP PC2 F
7/34	Technology CPUs
7/34	- CPU 1515SP PC2 T
7/38	- CPU 1515SP PC2 TF
7/42	<u>SIPLUS ET 200SP Open Controllers</u>
7/42	SIPLUS standard CPUs
7/42	- SIPLUS CPU 1515SP PC2
7/44	SIPLUS fail-safe CPUs
7/44	- SIPLUS CPU 1515SP PC2 F
<b>7/46</b>	<b>based on ET 200Pro</b>
7/46	<u>Standard CPUs</u>
7/46	IM 154-8 PN/DP CPU
7/50	CPU 1513pro-2 PN
7/54	CPU 1516pro-2 PN
7/58	<u>Fail-safe CPUs</u>
7/58	IM 154-8 F PN/DP CPU
7/63	CPU 1513pro F-2 PN
7/67	CPU 1516pro F-2 PN

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1510SP-1 PN

#### Overview



- CPU 1510SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: Programming device/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as runtime option for easy connection of the SIMATIC ET 200SP to non-Siemens devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes

#### Note

SIMATIC Memory Card required for operation of the CPU. The BusAdapter is not included in scope of supply and is to be ordered separately.

#### Ordering data

#### Article No.

<b>CPU 1510SP-1 PN</b>	<b>6ES7510-1DJ01-0AB0</b>
100 KB work memory for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
<b>Accessories</b>	
<b>CM DP for ET 200SP CPU</b>	<b>6ES7545-5DA00-0AB0</b>
PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	
<b>SIMATIC Memory Card</b>	
4 MB	<b>6ES7954-8LC03-0AA0</b>
12 MB	<b>6ES7954-8LE03-0AA0</b>
24 MB	<b>6ES7954-8LF03-0AA0</b>
256 MB	<b>6ES7954-8LL03-0AA0</b>
2 GB	<b>6ES7954-8LP03-0AA0</b>
32 GB	<b>6ES7954-8LT03-0AA0</b>
<b>DIN rail, 35 mm</b>	
• Length 483 mm for 19" cabinets	<b>6ES710-8MA11</b>
• Length 530 mm for 600 mm cabinets	<b>6ES710-8MA21</b>
• Length 830 mm for 900 mm cabinets	<b>6ES710-8MA31</b>
• Length 2 m	<b>6ES710-8MA41</b>
<b>PE connection element for 2 000 mm DIN rail</b>	<b>6ES7590-5AA00-0AA0</b>
<b>BusAdapter BA 2xRJ45</b>	<b>6ES7193-6AR00-0AA0</b>
<b>BusAdapter BA 2xFC for increased vibration and EMC loads</b>	<b>6ES7193-6AF00-0AA0</b>
<b>BusAdapter BA 2xSCRJ</b>	<b>6ES7193-6AP00-0AA0</b>
<b>BusAdapter BA SCRJ/RJ45</b>	<b>6ES7193-6AP20-0AA0</b>
<b>BusAdapter BA SCRJ/FC</b>	<b>6ES7193-6AP40-0AA0</b>
<b>Equipment labeling plate</b>	<b>6ES7193-6LF30-0AW0</b>
10 sheets of 16 labels	
<b>Labeling strips</b>	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>

Ordering data	Article No.	Article No.
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		
<b>IE FC RJ45 plug 90</b> 90° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB20-2AA0</b> <b>6GK1901-1BB20-2AB0</b> <b>6GK1901-1BB20-2AE0</b>	
<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>	
<b>IE FC TP trailing cable 2 x 2 (type C)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>	
<b>IE FC TP marine cable 2 x 2 (type B)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>	
<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>	
<b>Manuals for ET 200SP distributed I/O system</b> ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>		
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC		<b>6ES7998-8XC01-8YE0</b>
<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates		<b>6ES7998-8XC01-8YE2</b>
<b>STEP 7 Professional V17</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) <ul style="list-style-type: none"> <li>Windows 10 Professional Version 1909, 2004, 20H2</li> <li>Windows 10 Enterprise Version 1909, 2004, 20H2</li> <li>Windows 10 IoT Enterprise 2016 LTSC</li> <li>Windows 10 IoT Enterprise 2019 LTSC</li> </ul> Windows Server (64-bit) <ul style="list-style-type: none"> <li>Windows Server 2016 Standard (full installation)</li> <li>Windows Server 2019 Standard (full installation)</li> </ul> Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V17, floating license STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup> Email address required for delivery		<b>6ES7822-1AA07-0YA5</b> <b>6ES7822-1AE07-0YA5</b>
<b>Spare parts</b>		
<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>With push-in terminals; 10 units</li> </ul>		<b>6ES7193-4JB00-0AA0</b>
<b>Cover for BusAdapter interface</b> 5 units		<b>6ES7591-3AA00-0AA0</b>
<b>Server module</b>		<b>6ES7193-6PA00-0AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1510SP-1 PN

#### Technical specifications

Article number	<b>6ES7510-1DJ01-0AB0</b> CPU 1510SP-1 PN, 100KB Prog./750KB Data
<b>General information</b>	
Product type designation	CPU 1510SP-1 PN
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V13 SP1 Update 4 (FW V1.8) or higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	100 kbyte
• integrated (for data)	750 kbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	72 ns
for word operations, typ.	86 ns
for fixed point arithmetic, typ.	115 ns
for floating point arithmetic, typ.	461 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Address space per module</b>	
• Address space per module, max.	288 byte; For input and output data respectively
<b>Address space per station</b>	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock

Article number	<b>6ES7510-1DJ01-0AB0</b> CPU 1510SP-1 PN, 100KB Prog./750KB Data
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
<b>PROFINET IO Controller Services</b>	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	64; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	64
- of which in line, max.	64
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

**Technical specifications**

Article number	<b>6ES7510-1DJ01-0AB0</b> CPU 1510SP-1 PN, 100KB Prog./750KB Data
<b>2. Interface</b>	
<b>Interface types</b>	
• RS 485	Yes; Via CM DP module
• Number of ports	1
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	<b>6ES7510-1DJ01-0AB0</b> CPU 1510SP-1 PN, 100KB Prog./750KB Data
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	100 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	310 g

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1512SP-1 PN

#### Overview



- CPU 1512SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes

#### Note

SIMATIC Memory Card required for operation of the CPU. BusAdapter is not included in scope of supply and is to be ordered separately.

#### Ordering data

#### Article No.

<b>CPU 1512SP-1 PN</b> 200 KB work memory for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	<b>6ES7512-1DK01-0AB0</b>
<b>Accessories</b>	
<b>CM DP for ET 200SP CPU</b> PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	<b>6ES7545-5DA00-0AB0</b>
<b>SIMATIC Memory Card</b>	
4 MB	<b>6ES7954-8LC03-0AA0</b>
12 MB	<b>6ES7954-8LE03-0AA0</b>
24 MB	<b>6ES7954-8LF03-0AA0</b>
256 MB	<b>6ES7954-8LL03-0AA0</b>
2 GB	<b>6ES7954-8LP03-0AA0</b>
32 GB	<b>6ES7954-8LT03-0AA0</b>
<b>DIN rail, 35 mm</b>	
• Length 483 mm for 19" cabinets	<b>6ES5710-8MA11</b>
• Length 530 mm for 600 mm cabinets	<b>6ES5710-8MA21</b>
• Length 830 mm for 900 mm cabinets	<b>6ES5710-8MA31</b>
• Length 2 m	<b>6ES5710-8MA41</b>
<b>PE connection element for 2 000 mm DIN rail</b>	<b>6ES7590-5AA00-0AA0</b>
<b>BusAdapter BA 2xRJ45</b>	<b>6ES7193-6AR00-0AA0</b>
<b>BusAdapter BA 2xFC for increased vibration and EMC loads</b>	<b>6ES7193-6AF00-0AA0</b>
<b>BusAdapter BA 2xSCRJ</b>	<b>6ES7193-6AP00-0AA0</b>
<b>BusAdapter BA SCRJ/RJ45</b>	<b>6ES7193-6AP20-0AA0</b>
<b>BusAdapter BA SCRJ/FC</b>	<b>6ES7193-6AP40-0AA0</b>
<b>BusAdapter BA 2xLC</b>	<b>6ES7193-6AG00-0AA0</b>
<b>BusAdapter BA LC/RJ45</b>	<b>6ES7193-6AG20-0AA0</b>
<b>BusAdapter BA LC/FC</b>	<b>6ES7193-6AG40-0AA0</b>
<b>Equipment labeling plate</b>	<b>6ES7193-6LF30-0AW0</b>
10 sheets of 16 labels	
<b>Labeling strips</b>	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>



Ordering data	Article No.	Article No.
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		
<b>IE FC RJ45 plug 90</b> 90° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB20-2AA0</b> <b>6GK1901-1BB20-2AB0</b> <b>6GK1901-1BB20-2AE0</b>	
<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>	
<b>IE FC TP trailing cable 2 x 2 (type C)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>	
<b>IE FC TP marine cable 2 x 2 (type B)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>	
<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>	
<b>Manuals for ET 200SP distributed I/O system</b> ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>		
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC		<b>6ES7998-8XC01-8YE0</b>
<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates		<b>6ES7998-8XC01-8YE2</b>
<b>STEP 7 Professional V17</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) <ul style="list-style-type: none"> <li>Windows 10 Professional Version 1909, 2004, 20H2</li> <li>Windows 10 Enterprise Version 1909, 2004, 20H2</li> <li>Windows 10 IoT Enterprise 2016 LTSB</li> <li>Windows 10 IoT Enterprise 2019 LTSC</li> </ul> Windows Server (64-bit) <ul style="list-style-type: none"> <li>Windows Server 2016 Standard (full installation)</li> <li>Windows Server 2019 Standard (full installation)</li> </ul> Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V17, floating license STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup> Email address required for delivery		<b>6ES7822-1AA07-0YA5</b> <b>6ES7822-1AE07-0YA5</b>
<b>Spare parts</b>		
<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>With push-in terminals; 10 units</li> </ul>		<b>6ES7193-4JB00-0AA0</b>
<b>Cover for BusAdapter interface</b> 5 units		<b>6ES7591-3AA00-0AA0</b>
<b>Server module</b>		<b>6ES7193-6PA00-0AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# Distributed Controllers

based on ET 200SP  
Standard CPUs

## CPU 1512SP-1 PN

### Technical specifications

Article number	<b>6ES7512-1DK01-0AB0</b> CPU 1512SP-1 PN, 200KB Prog./1MB Data
<b>General information</b>	
Product type designation	CPU 1512SP-1 PN
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V13 SP1 Update 4 (FW V1.8) or higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	200 kbyte
• integrated (for data)	1 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Address space per module</b>	
• Address space per module, max.	288 byte; For input and output data respectively
<b>Address space per station</b>	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock

Article number	<b>6ES7512-1DK01-0AB0</b> CPU 1512SP-1 PN, 200KB Prog./1MB Data
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC,
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
<b>PROFINET IO Controller Services</b>	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochro- nous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

**Technical specifications**

Article number	<b>6ES7512-1DK01-0AB0</b> CPU 1512SP-1 PN, 200KB Prog./1MB Data
<b>2. Interface</b>	
<b>Interface types</b>	
• RS 485	Yes; Via CM DP module
• Number of ports	1
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	<b>6ES7512-1DK01-0AB0</b> CPU 1512SP-1 PN, 200KB Prog./1MB Data
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	100 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	310 g

## Distributed Controllers

based on ET 200SP  
SIPLUS standard CPUs

### SIPLUS CPU 1510SP-1 PN

#### Overview



- SIPLUS CPU 1510SP-1 PN for SIPLUS ET 200SP based on SIPLUS-S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

#### Note

SIMATIC Memory Card required for operation of the CPU. The BusAdapter is not included in the scope of supply and is to be ordered separately. No BusAdapter can be inserted with the variant for the temperature range -40...+70 °C.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### SIPLUS CPU 1510SP-1 PN

(Extended temperature range and exposure to environmental substances)

Work memory 100 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC Memory Card required

Temperature range -40 ... +60 °C

**6AG1510-1DJ01-2AB0**

Temperature range -40 ... +70 °C; No BusAdapter can be inserted

**6AG1510-1DJ01-7AB0**

##### Accessories

##### BusAdapter BA 2xRJ45

**6AG1193-6AR00-7AA0**

(Extended temperature range and exposure to environmental substances)

##### BusAdapter BA 2xFC for increased vibration and EMC loads

**6AG1193-6AF00-7AA0**

(Extended temperature range and exposure to environmental substances)

##### IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

##### IE FC RJ45 plug 180

(Extended temperature range and exposure to environmental substances)

180° cable outlet

1 unit

**6AG1901-1BB10-7AA0**

##### SIPLUS Mounting Kit ET 200SP

**6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads.

Not approved for SIPLUS CPU 6AG1510-1DJ01-7AB0 and BusAdapter BA 2xRJ45

##### Other accessories

See SIMATIC ET 200SP CPU 1510SP-1 PN, page 7/2

**Technical specifications**

Article number	<b>6AG1510-1DJ01-2AB0</b>	<b>6AG1510-1DJ01-7AB0</b>
Based on	<b>6ES7510-1DJ01-0AB0</b> SIPLUS ET 200SP CPU 1510SP-1 PN	<b>6ES7510-1DJ01-0AB0</b> SIPLUS ET 200SP CPU 1510SP-1 PN
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in acc. with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Distributed Controllers

based on ET 200SP  
SIPLUS standard CPUs

### SIPLUS CPU 1512SP-1 PN

#### Overview



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- SIPLUS CPU 1512SP-1 PN for SIPLUS ET 200SP based on SIPLUS S7-1500 CPU 1513-1 PN
- For applications with medium requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

#### Note

SIMATIC Memory Card required for operation of the CPU. BusAdapter is not included in scope of supply and is to be ordered separately.

No BusAdapter can be inserted with the variant for the temperature range -40...+70 °C.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### SIPLUS CPU 1512SP-1 PN

(Extended temperature range and exposure to environmental substances)

Work memory 200 KB for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required

Temperature range -40 ... +60 °C

**6AG1512-1DK01-2AB0**

Temperature range -40 ... +70 °C; No BusAdapter can be inserted

**6AG1512-1DK01-7AB0**

##### Accessories

##### BusAdapter BA 2xRJ45

**6AG1193-6AR00-7AA0**

(Extended temperature range and exposure to environmental substances)

##### BusAdapter BA 2xFC for increased vibration and EMC loads

**6AG1193-6AF00-7AA0**

(Extended temperature range and exposure to environmental substances)

##### IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

##### IE FC RJ45 plug 180

180° cable outlet

1 unit

**6AG1901-1BB10-7AA0**

##### SIPLUS Mounting Kit ET 200SP

**6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads.

Not approved for SIPLUS CPU 6AG1512-1DK01-7AB0 and BusAdapter BA 2xRJ45

##### Other accessories

See SIMATIC ET 200SP, CPU 1512SP-1 PN, page 7/6

**Technical specifications**

Article number	<b>6AG1512-1DK01-2AB0</b> <b>6ES7512-1DK01-0AB0</b> SIPLUS ET 200SP CPU 1512SP-1 PN	<b>6AG1512-1DK01-7AB0</b> <b>6ES7512-1DK01-0AB0</b> SIPLUS ET 200SP CPU 1512SP-1 PN
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
• With condensation, tested in acc. with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1510SP F-1 PN

#### Overview



- CPU 1510SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: Programming device/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as runtime option for easy connection of the SIMATIC ET 200SP to non-Siemens devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

#### Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

#### Ordering data

#### Article No.

<b>CPU 1510SP F-1 PN</b>	<b>6ES7510-1SJ01-0AB0</b>
150 KB work memory for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
<b>Accessories</b>	
<b>CM DP for ET 200SP CPU</b>	<b>6ES7545-5DA00-0AB0</b>
PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	
<b>SIMATIC Memory Card</b>	
4 MB	<b>6ES7954-8LC03-0AA0</b>
12 MB	<b>6ES7954-8LE03-0AA0</b>
24 MB	<b>6ES7954-8LF03-0AA0</b>
256 MB	<b>6ES7954-8LL03-0AA0</b>
2 GB	<b>6ES7954-8LP03-0AA0</b>
32 GB	<b>6ES7954-8LT03-0AA0</b>
<b>DIN rail, 35 mm</b>	
• Length 483 mm for 19" cabinets	<b>6ES710-8MA11</b>
• Length 530 mm for 600 mm cabinets	<b>6ES710-8MA21</b>
• Length 830 mm for 900 mm cabinets	<b>6ES710-8MA31</b>
• Length 2 m	<b>6ES710-8MA41</b>
<b>PE connection element for 2 000 mm DIN rail</b>	<b>6ES7590-5AA00-0AA0</b>
<b>BusAdapter BA 2xRJ45</b>	<b>6ES7193-6AR00-0AA0</b>
<b>BusAdapter BA 2xFC for increased vibration and EMC loads</b>	<b>6ES7193-6AF00-0AA0</b>
<b>BusAdapter BA 2xSCRJ</b>	<b>6ES7193-6AP00-0AA0</b>
<b>BusAdapter BA SCRJ/RJ45</b>	<b>6ES7193-6AP20-0AA0</b>
<b>BusAdapter BA SCRJ/FC</b>	<b>6ES7193-6AP40-0AA0</b>
<b>Equipment labeling plate</b>	<b>6ES7193-6LF30-0AW0</b>
10 sheets of 16 labels	
<b>Labeling strips</b>	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>
<b>IE FC RJ45 plugs</b>	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
<b>IE FC RJ45 plug 90</b>	
90° cable outlet	
1 unit	<b>6GK1901-1BB20-2AA0</b>
10 units	<b>6GK1901-1BB20-2AB0</b>
50 units	<b>6GK1901-1BB20-2AE0</b>

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Ordering data	Article No.	Article No.
<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>	
<b>IE FC TP trailing cable 2 x 2 (type C)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>	
<b>IE FC TP marine cable 2 x 2 (type B)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>	
<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>	
<b>Manuals for ET 200SP distributed I/O system</b> ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>		
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>	
<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>	
		<b>STEP 7 Professional V17</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) <ul style="list-style-type: none"> <li>Windows 10 Professional Version 1909, 2004, 20H2</li> <li>Windows 10 Enterprise Version 1909, 2004, 20H2</li> <li>Windows 10 IoT Enterprise 2016 LTSC</li> <li>Windows 10 IoT Enterprise 2019 LTSC</li> </ul> Windows Server (64-bit) <ul style="list-style-type: none"> <li>Windows Server 2016 Standard (full installation)</li> <li>Windows Server 2019 Standard (full installation)</li> </ul> Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V17, floating license <b>6ES7822-1AA07-0YA5</b> STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup> <b>6ES7822-1AE07-0YA5</b> Email address required for delivery
		<b>STEP 7 Safety Advanced V17</b> Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V17 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case. Floating license for 1 user; license key on USB flash drive <b>6ES7833-1FA17-0YA5</b> Floating license for 1 user; license key for download <sup>1)</sup> ; Email address required for delivery <b>6ES7833-1FA17-0YH5</b>
		<b>Spare parts</b> <b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>With push-in terminals; 10 units</li> </ul> <b>6ES7193-4JB00-0AA0</b>
		<b>Cover for BusAdapter interface</b> 5 units <b>6ES7591-3AA00-0AA0</b>
		<b>Server module</b> <b>6ES7193-6PA00-0AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1510SP F-1 PN

#### Technical specifications

Article number	<b>6ES7510-1SJ01-0AB0</b> CPU1510SP F-1 PN, 150KB Prog./750KB Data
<b>General information</b>	
Product type designation	CPU 1510SP F-1 PN
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V13 SP1 Update 4 (FW V1.8) or higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	150 kbyte
• integrated (for data)	750 kbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	72 ns
for word operations, typ.	86 ns
for fixed point arithmetic, typ.	115 ns
for floating point arithmetic, typ.	461 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Address space per module</b>	
• Address space per module, max.	288 byte; For input and output data respectively
<b>Address space per station</b>	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock

Article number	<b>6ES7510-1SJ01-0AB0</b> CPU1510SP F-1 PN, 150KB Prog./750KB Data
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
<b>PROFINET IO Controller Services</b>	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	64; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	64
- of which in line, max.	64
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

**Technical specifications**

Article number	<b>6ES7510-1SJ01-0AB0</b> CPU1510SP F-1 PN, 150KB Prog./750KB Data
<b>2. Interface</b>	
<b>Interface types</b>	
• RS 485	Yes; Via CM DP module
• Number of ports	1
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	<b>6ES7510-1SJ01-0AB0</b> CPU1510SP F-1 PN, 150KB Prog./750KB Data
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	100 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	310 g

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1512SP F-1 PN

#### Overview



- CPU 1512SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- Supports PROFI-safe in centralized and distributed configuration
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: Programming device/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as runtime option for easy connection of the SIMATIC ET 200SP to non-Siemens devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

#### Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

#### Ordering data

#### Article No.

**CPU 1512SP F-1 PN** **6ES7512-1SK01-0AB0**

300 KB work memory for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required

#### Accessories

**CM DP for ET 200SP CPU** **6ES7545-5DA00-0AB0**

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

#### SIMATIC Memory Card

4 MB	<b>6ES7954-8LC03-0AA0</b>
12 MB	<b>6ES7954-8LE03-0AA0</b>
24 MB	<b>6ES7954-8LF03-0AA0</b>
256 MB	<b>6ES7954-8LL03-0AA0</b>
2 GB	<b>6ES7954-8LP03-0AA0</b>
32 GB	<b>6ES7954-8LT03-0AA0</b>

#### DIN rail, 35 mm

• Length 483 mm for 19" cabinets	<b>6ES710-8MA11</b>
• Length 530 mm for 600 mm cabinets	<b>6ES710-8MA21</b>
• Length 830 mm for 900 mm cabinets	<b>6ES710-8MA31</b>
• Length 2 m	<b>6ES710-8MA41</b>

**PE connection element for 2 000 mm DIN rail** **6ES7590-5AA00-0AA0**

**BusAdapter BA 2xRJ45** **6ES7193-6AR00-0AA0**

**BusAdapter BA 2xFC for increased vibration and EMC loads** **6ES7193-6AF00-0AA0**

**BusAdapter BA 2xSCRJ** **6ES7193-6AP00-0AA0**

**BusAdapter BA SCRJ/RJ45** **6ES7193-6AP20-0AA0**

**BusAdapter BA SCRJ/FC** **6ES7193-6AP40-0AA0**

**Equipment labeling plate** **6ES7193-6LF30-0AW0**

10 sheets of 16 labels

#### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer **6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer **6ES7193-6LR10-0AG0**

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer **6ES7193-6LA10-0AA0**

1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer **6ES7193-6LA10-0AG0**

#### IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

#### IE FC RJ45 plug 90

90° cable outlet	
1 unit	<b>6GK1901-1BB20-2AA0</b>
10 units	<b>6GK1901-1BB20-2AB0</b>
50 units	<b>6GK1901-1BB20-2AE0</b>

Ordering data	Article No.	Article No.
<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	
<b>IE FC TP standard cable GP 2x2</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>	
<b>IE FC TP trailing cable 2 x 2 (type C)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>	
<b>IE FC TP marine cable 2 x 2 (type B)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>	
<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>	
<b>Manuals for ET 200SP distributed I/O system</b> ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>		
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>	
<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>	
		<b>STEP 7 Professional V17</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 1909, 2004, 20H2 • Windows 10 Enterprise Version 1909, 2004, 20H2 • Windows 10 IoT Enterprise 2016 LTSC • Windows 10 IoT Enterprise 2019 LTSC Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V17, floating license <b>6ES7822-1AA07-0YA5</b> STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup> <b>6ES7822-1AE07-0YA5</b> Email address required for delivery
		<b>STEP 7 Safety Advanced V17</b> Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V17 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case. Floating license for 1 user; license key on USB flash drive <b>6ES7833-1FA17-0YA5</b> Floating license for 1 user; license key for download <sup>1)</sup> ; Email address required for delivery <b>6ES7833-1FA17-0YH5</b>
		<b>Spare parts</b> <b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units <b>6ES7193-4JB00-0AA0</b>
		<b>Cover for BusAdapter interface</b> 5 units <b>6ES7591-3AA00-0AA0</b>
		<b>Server module</b> <b>6ES7193-6PA00-0AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1512SP F-1 PN

#### Technical specifications

Article number	<b>6ES7512-1SK01-0AB0</b> CPU 1512SP F-1 PN, 300KB Prog./1MB Data
<b>General information</b>	
Product type designation	CPU 1512SP F-1 PN
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V13 SP1 Update 4 (FW V1.8) or higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	300 kbyte
• integrated (for data)	1 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Address space per module</b>	
• Address space per module, max.	288 byte; For input and output data respectively
<b>Address space per station</b>	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock

Article number	<b>6ES7512-1SK01-0AB0</b> CPU 1512SP F-1 PN, 300KB Prog./1MB Data
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
<b>PROFINET IO Controller Services</b>	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

## Technical specifications

Article number	<b>6ES7512-1SK01-0AB0</b> CPU 1512SP F-1 PN, 300KB Prog./1MB Data
<b>2. Interface</b>	
<b>Interface types</b>	
• RS 485	Yes; Via CM DP module
• Number of ports	1
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	<b>6ES7512-1SK01-0AB0</b> CPU 1512SP F-1 PN, 300KB Prog./1MB Data
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	100 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	310 g

## Distributed Controllers

based on ET 200SP  
SIPLUS fail-safe CPUs

### SIPLUS CPU 1510SP F-1 PN

#### Overview



- SIPLUS CPU 1510SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

#### Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### SIPLUS CPU 1510SP F-1 PN

6AG1510-1SJ01-2AB0

(Extended temperature range and exposure to environmental substances)

Work memory 150 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC Memory Card required

##### Accessories

##### SIPLUS BusAdapter BA 2xRJ45

6AG1193-6AR00-7AA0

##### SIPLUS BusAdapter BA 2xFC

6AG1193-6AF00-7AA0

##### IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

##### IE FC RJ45 plug 180

(Extended temperature range and exposure to environmental substances)

180° cable outlet

1 unit

6AG1901-1BB10-7AA0

##### SIPLUS Mounting Kit ET 200SP

6AG1193-6AA00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter BA 2xRJ45

##### Other accessories

See SIMATIC ET 200SP, CPU 1510 F-1 PN, page 7/14



**Technical specifications**

Article number	<b>6AG1510-1SJ01-2AB0</b>
Based on	<b>6ES7510-1SJ01-0AB0</b> SIPLUS ET 200SP CPU 1510SP F-1PN
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	<b>6AG1510-1SJ01-2AB0</b>
Based on	<b>6ES7510-1SJ01-0AB0</b> SIPLUS ET 200SP CPU 1510SP F-1PN
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Distributed Controllers

based on ET 200SP  
SIPLUS fail-safe CPUs

### SIPLUS CPU 1512SP F-1 PN

#### Overview



- SIPLUS CPU 1512SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

#### Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

#### Ordering data

#### Article No.

##### SIPLUS CPU 1512SP F-1 PN

(Extended temperature range and exposure to environmental substances)

Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required

Temperature range -25 ... +60 °C

**6AG1512-1SK01-2AB0**

Temperature range -40 ... +70 °C

**6AG1512-1SK01-7AB0**

##### Accessories

##### SIPLUS BusAdapter BA 2xRJ45

**6AG1193-6AR00-7AA0**

##### SIPLUS BusAdapter BA 2xFC

**6AG1193-6AF00-7AA0**

##### IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

##### IE FC RJ45 plug 180

(Extended temperature range and exposure to environmental substances)

180° cable outlet

1 unit

**6AG1901-1BB10-7AA0**

##### SIPLUS Mounting Kit ET 200SP

**6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter 2xBA RJ45

##### Other accessories

See SIMATIC ET 200SP, CPU 1512 F-1 PN, page 7/18

**Technical specifications**

Article number	<b>6AG1512-1SK01-2AB0</b>	<b>6AG1512-1SK01-7AB0</b>
Based on	<b>6ES7512-1SK01-0AB0</b> SIPLUS ET 200SP CPU 1512SP F-1PN	<b>6ES7512-1SK01-0AB0</b> SIPLUS ET 200SP CPU 1512SP F-1 PN
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-25 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust (with the exception of oil droplets in the air); *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

### Overview



ET 200SP Open Controller, CPU 1515SP PC2, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

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### Ordering data

#### SIMATIC ET 200SP Open Controller CPU 1515SP PC2 (+ HMI)

ET 200SP central module with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Software Controller (optionally with WinCC RT Advanced); 8 GB RAM, 128 GB CFast card

Type of delivery:  
German, English, Chinese, Italian, French, Spanish

- CPU 1515SP PC2

With pre-installed WinCC RT Advanced

- CPU 1515SP PC2 + HMI 128PT
- CPU 1515SP PC2 + HMI 512PT
- CPU 1515SP PC2 + HMI 2048PT

#### Accessories

**BusAdapter BA 2xRJ45** 6ES7193-6AR00-0AA0

**BusAdapter BA 2xFC** 6ES7193-6AF00-0AA0

**BusAdapter BA 2xSCRJ** 6ES7193-6AP00-0AA0

**BusAdapter BA SCRJ/RJ45** 6ES7193-6AP20-0AA0

**BusAdapter BA SCRJ/FC** 6ES7193-6AP40-0AA0

For increased vibration and EMC loads

**BusAdapter BA 2XLC** 6ES7193-6AG00-0AA0

**BusAdapter BA LC/RJ45** 6ES7193-6AG20-0AA0

**BusAdapter BA LC/FC** 6ES7193-6AG40-0AA0

**CM DP for ET 200SP CPU** 6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

**Server module** 6ES7193-6PA00-0AA0

Spare part

**Power supply connector** 6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

### Article No.

6ES7677-2DB42-0GB0

6ES7677-2DB42-0GK0

6ES7677-2DB42-0GL0

6ES7677-2DB42-0GM0

6ES7193-6AG00-0AA0

6ES7193-6AG20-0AA0

6ES7193-6AG40-0AA0

6ES7545-5DA00-0AB0

6ES7193-6PA00-0AA0

6ES7193-4JB00-0AA0

### Article No.

#### Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

#### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

#### STEP 7 Professional V17

Target system:  
SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

#### Requirement:

- Windows 10 (64-bit)
- Windows 10 Professional Version 1909, 2004, 20H2
  - Windows 10 Enterprise Version 1909, 2004, 20H2
  - Windows 10 IoT Enterprise 2016 LTSC
  - Windows 10 IoT Enterprise 2019 LTSC
- Windows Server (64-bit)
- Windows Server 2016 Standard (full installation)
  - Windows Server 2019 Standard (full installation)

Type of delivery:  
9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V17, floating license

6ES7822-1AA07-0YA5

STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>

6ES7822-1AE07-0YA5

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <https://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Technical specifications																																																																																																		
<b>SIMATIC ODK 1500S</b> Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; Single License; supplied on DVD Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; Single License; software download <sup>1)</sup> Email address required for delivery Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) <sup>1)</sup> Email address required for delivery Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as of V1.0; software download including license key (floating license) <sup>1)</sup> Email address required for delivery	<b>6ES7806-2CD02-0YA0</b>  <b>6ES7806-2CD02-0YG0</b>  <b>6ES7806-2CD03-0YA0</b>  <b>6ES7806-2CD03-0YG0</b>  <b>6ES7806-2CD03-0YK0</b>	<table border="1"> <tr> <td>Article number</td> <td><b>6ES7677-2DB42-0GB0</b> CPU1515SP PC2</td> </tr> <tr> <td colspan="2"><b>General information</b></td> </tr> <tr> <td>Product type designation</td> <td>CPU 1515SP PC2</td> </tr> <tr> <td colspan="2"><b>Engineering with</b></td> </tr> <tr> <td>• STEP 7 TIA Portal configurable/integrated from version</td> <td>V16</td> </tr> <tr> <td colspan="2"><b>Installed software</b></td> </tr> <tr> <td>• Visualization</td> <td>No</td> </tr> <tr> <td>• Control</td> <td>S7-1500 Software Controller CPU 1505SP</td> </tr> <tr> <td colspan="2"><b>Supply voltage</b></td> </tr> <tr> <td>Type of supply voltage</td> <td>24 V DC</td> </tr> <tr> <td colspan="2"><b>Processor</b></td> </tr> <tr> <td>Processor type</td> <td>Intel Atom E3940, 1.6 GHz, 4 cores</td> </tr> <tr> <td colspan="2"><b>Memory</b></td> </tr> <tr> <td>Type of memory</td> <td>DDR3L</td> </tr> <tr> <td>Main memory</td> <td>8 GB RAM</td> </tr> <tr> <td>CFast memory card</td> <td>Yes; 128 GB flash memory</td> </tr> <tr> <td colspan="2"><b>Work memory</b></td> </tr> <tr> <td>• integrated (for program)</td> <td>1 Mbyte</td> </tr> <tr> <td>• integrated (for data)</td> <td>5 Mbyte</td> </tr> <tr> <td>• integrated (for CPU function library of CPU Runtime)</td> <td>20 Mbyte</td> </tr> <tr> <td colspan="2"><b>Load memory</b></td> </tr> <tr> <td>• integrated (on PC mass storage)</td> <td>320 Mbyte</td> </tr> <tr> <td colspan="2"><b>CPU processing times</b></td> </tr> <tr> <td>for bit operations, typ.</td> <td>10 ns</td> </tr> <tr> <td>for word operations, typ.</td> <td>12 ns</td> </tr> <tr> <td>for fixed point arithmetic, typ.</td> <td>16 ns</td> </tr> <tr> <td>for floating point arithmetic, typ.</td> <td>64 ns</td> </tr> <tr> <td colspan="2"><b>Counters, timers and their retentivity</b></td> </tr> <tr> <td colspan="2"><b>S7 counter</b></td> </tr> <tr> <td>• Number</td> <td>2 048</td> </tr> <tr> <td colspan="2"><b>IEC counter</b></td> </tr> <tr> <td>• Number</td> <td>Any (only limited by the main memory)</td> </tr> <tr> <td colspan="2"><b>S7 times</b></td> </tr> <tr> <td>• Number</td> <td>2 048</td> </tr> <tr> <td colspan="2"><b>IEC timer</b></td> </tr> <tr> <td>• Number</td> <td>Any (only limited by the main memory)</td> </tr> <tr> <td colspan="2"><b>Data areas and their retentivity</b></td> </tr> <tr> <td colspan="2"><b>Flag</b></td> </tr> <tr> <td>• Size, max.</td> <td>16 kbyte</td> </tr> <tr> <td colspan="2"><b>Address area</b></td> </tr> <tr> <td colspan="2"><b>I/O address area</b></td> </tr> <tr> <td>• Inputs</td> <td>32 kbyte; All inputs are in the process image</td> </tr> <tr> <td>• Outputs</td> <td>32 kbyte; All outputs are in the process image</td> </tr> <tr> <td colspan="2"><b>Hardware configuration</b></td> </tr> <tr> <td>Integrated power supply</td> <td>Yes</td> </tr> <tr> <td colspan="2"><b>Time of day</b></td> </tr> <tr> <td colspan="2"><b>Clock</b></td> </tr> <tr> <td>• Type</td> <td>Hardware clock</td> </tr> <tr> <td>• Hardware clock (real-time)</td> <td>Yes; Resolution: 1 s</td> </tr> </table>	Article number	<b>6ES7677-2DB42-0GB0</b> CPU1515SP PC2	<b>General information</b>		Product type designation	CPU 1515SP PC2	<b>Engineering with</b>		• STEP 7 TIA Portal configurable/integrated from version	V16	<b>Installed software</b>		• Visualization	No	• Control	S7-1500 Software Controller CPU 1505SP	<b>Supply voltage</b>		Type of supply voltage	24 V DC	<b>Processor</b>		Processor type	Intel Atom E3940, 1.6 GHz, 4 cores	<b>Memory</b>		Type of memory	DDR3L	Main memory	8 GB RAM	CFast memory card	Yes; 128 GB flash memory	<b>Work memory</b>		• integrated (for program)	1 Mbyte	• integrated (for data)	5 Mbyte	• integrated (for CPU function library of CPU Runtime)	20 Mbyte	<b>Load memory</b>		• integrated (on PC mass storage)	320 Mbyte	<b>CPU processing times</b>		for bit operations, typ.	10 ns	for word operations, typ.	12 ns	for fixed point arithmetic, typ.	16 ns	for floating point arithmetic, typ.	64 ns	<b>Counters, timers and their retentivity</b>		<b>S7 counter</b>		• Number	2 048	<b>IEC counter</b>		• Number	Any (only limited by the main memory)	<b>S7 times</b>		• Number	2 048	<b>IEC timer</b>		• Number	Any (only limited by the main memory)	<b>Data areas and their retentivity</b>		<b>Flag</b>		• Size, max.	16 kbyte	<b>Address area</b>		<b>I/O address area</b>		• Inputs	32 kbyte; All inputs are in the process image	• Outputs	32 kbyte; All outputs are in the process image	<b>Hardware configuration</b>		Integrated power supply	Yes	<b>Time of day</b>		<b>Clock</b>		• Type	Hardware clock	• Hardware clock (real-time)	Yes; Resolution: 1 s
Article number	<b>6ES7677-2DB42-0GB0</b> CPU1515SP PC2																																																																																																			
<b>General information</b>																																																																																																				
Product type designation	CPU 1515SP PC2																																																																																																			
<b>Engineering with</b>																																																																																																				
• STEP 7 TIA Portal configurable/integrated from version	V16																																																																																																			
<b>Installed software</b>																																																																																																				
• Visualization	No																																																																																																			
• Control	S7-1500 Software Controller CPU 1505SP																																																																																																			
<b>Supply voltage</b>																																																																																																				
Type of supply voltage	24 V DC																																																																																																			
<b>Processor</b>																																																																																																				
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores																																																																																																			
<b>Memory</b>																																																																																																				
Type of memory	DDR3L																																																																																																			
Main memory	8 GB RAM																																																																																																			
CFast memory card	Yes; 128 GB flash memory																																																																																																			
<b>Work memory</b>																																																																																																				
• integrated (for program)	1 Mbyte																																																																																																			
• integrated (for data)	5 Mbyte																																																																																																			
• integrated (for CPU function library of CPU Runtime)	20 Mbyte																																																																																																			
<b>Load memory</b>																																																																																																				
• integrated (on PC mass storage)	320 Mbyte																																																																																																			
<b>CPU processing times</b>																																																																																																				
for bit operations, typ.	10 ns																																																																																																			
for word operations, typ.	12 ns																																																																																																			
for fixed point arithmetic, typ.	16 ns																																																																																																			
for floating point arithmetic, typ.	64 ns																																																																																																			
<b>Counters, timers and their retentivity</b>																																																																																																				
<b>S7 counter</b>																																																																																																				
• Number	2 048																																																																																																			
<b>IEC counter</b>																																																																																																				
• Number	Any (only limited by the main memory)																																																																																																			
<b>S7 times</b>																																																																																																				
• Number	2 048																																																																																																			
<b>IEC timer</b>																																																																																																				
• Number	Any (only limited by the main memory)																																																																																																			
<b>Data areas and their retentivity</b>																																																																																																				
<b>Flag</b>																																																																																																				
• Size, max.	16 kbyte																																																																																																			
<b>Address area</b>																																																																																																				
<b>I/O address area</b>																																																																																																				
• Inputs	32 kbyte; All inputs are in the process image																																																																																																			
• Outputs	32 kbyte; All outputs are in the process image																																																																																																			
<b>Hardware configuration</b>																																																																																																				
Integrated power supply	Yes																																																																																																			
<b>Time of day</b>																																																																																																				
<b>Clock</b>																																																																																																				
• Type	Hardware clock																																																																																																			
• Hardware clock (real-time)	Yes; Resolution: 1 s																																																																																																			
<b>WinCC Advanced V17</b> Engineering software in the TIA Portal; in 6 languages: de, en, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime • Floating license; software and documentation on DVD; license key on USB flash drive • Floating license; software, documentation and license key for download <sup>1)</sup> ; Email address required for delivery	<b>6AV2102-0AA07-0AA5</b>  <b>6AV2102-0AA07-0AH5</b>																																																																																																			

<sup>1)</sup> For up-to-date information and download availability, see: <https://www.siemens.com/tia-online-software-delivery>

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

### Technical specifications

Article number	<b>6ES7677-2DB42-0GB0</b> CPU1515SP PC2
<b>Interfaces</b>	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1
<b>Video interfaces</b>	
• Graphics interface	1x DisplayPort
<b>1. Interface</b>	
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes

Article number	<b>6ES7677-2DB42-0GB0</b> CPU1515SP PC2
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
<b>2. Interface</b>	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1

## Technical specifications

Article number	<b>6ES7677-2DB42-0GB0</b> CPU1515SP PC2
<b>3. Interface</b>	
Interface type	PROFIBUS with CM DP
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Services</b>	
- Equidistance	No
- Isochronous mode	No
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	88
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	Yes
- Switchover time on line break, typ.	200 ms
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes; From SW CPU 1505SP V2.6
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required
<b>Supported technology objects</b>	
Motion Control	Yes
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	<b>6ES7677-2DB42-0GB0</b> CPU1515SP PC2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules
<b>Operating systems</b>	
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSC, 64bit, MUI
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	5.8 Mbyte
<b>Peripherals/Options</b>	
SD card	Optionally for additional mass storage
<b>Dimensions</b>	
Width	160 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	0.83 kg

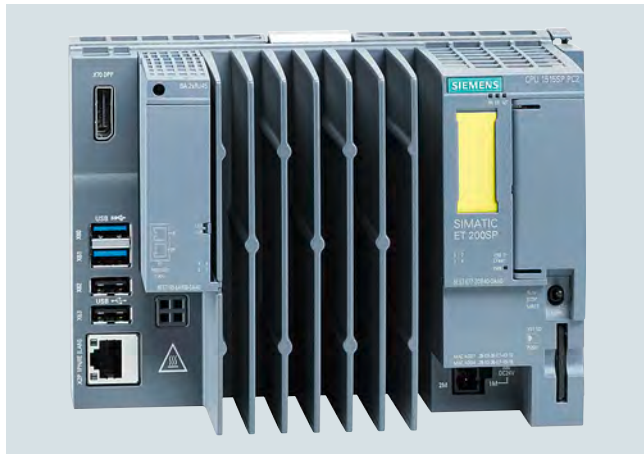
## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

### Overview



ET 200SP Open Controller, CPU 1515SP PC2 F, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

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### Ordering data

#### SIMATIC ET 200SP Open Controller CPU 1515SP PC2 F (+ HMI)

Fail-safe ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Failsafe Software Controller (optionally with WinCC RT Advanced); 8 GB RAM, 128 GB CFast card;

#### Type of delivery:

German, English, Chinese, Italian, French, Spanish

- CPU 1515SP PC2 F

With pre-installed WinCC RT Advanced

- CPU 1515SP PC2 F + HMI 128PT
- CPU 1515SP PC2 F + HMI 512PT
- CPU 1515SP PC2 F + HMI 2048PT

#### Accessories

**BusAdapter BA 2xRJ45** 6ES7193-6AR00-0AA0

**BusAdapter BA 2xFC** 6ES7193-6AF00-0AA0

**BusAdapter BA 2xSCRJ** 6ES7193-6AP00-0AA0

**BusAdapter BA SCRJ/RJ45** 6ES7193-6AP20-0AA0

**BusAdapter BA SCRJ/FC** 6ES7193-6AP40-0AA0

For increased vibration and EMC loads

**BusAdapter BA 2XLC** 6ES7193-6AG00-0AA0

**BusAdapter BA LC/RJ45** 6ES7193-6AG20-0AA0

**BusAdapter BA LC/FC** 6ES7193-6AG40-0AA0

**CM DP for ET 200SP CPU** 6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

**Server module** 6ES7193-6PA00-0AA0

Spare part

**Power supply connector** 6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

### Article No.

### Article No.

#### Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

#### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

#### STEP 7 Professional V17

##### Target system:

SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

##### Requirement:

- Windows 10 (64-bit)
  - Windows 10 Professional Version 1909, 2004, 20H2
  - Windows 10 Enterprise Version 1909, 2004, 20H2
  - Windows 10 IoT Enterprise 2016 LTSC
  - Windows 10 IoT Enterprise 2019 LTSC

- Windows Server (64-bit)
  - Windows Server 2016 Standard (full installation)
  - Windows Server 2019 Standard (full installation)

##### Type of delivery:

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V17, floating license

6ES7822-1AA07-0YA5

STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>

6ES7822-1AE07-0YA5

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



**Ordering data****Article No.****SIMATIC ODK 1500S**

Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; Single License; supplied on DVD

**6ES7806-2CD02-0YA0**

Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; Single License; software download <sup>1)</sup>

**6ES7806-2CD02-0YG0**

Email address required for delivery

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive

**6ES7806-2CD03-0YA0**

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) <sup>1)</sup>

**6ES7806-2CD03-0YG0**

Email address required for delivery

Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as of V1.0; software download including license key (floating license) <sup>1)</sup>

**6ES7806-2CD03-0YK0**

Email address required for delivery

**WinCC Advanced V17**

Engineering software in the TIA Portal; in 6 languages: de, en, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime

- Floating license; software and documentation on DVD; license key on USB flash drive

**6AV2102-0AA07-0AA5**

- Floating license; software, documentation and license key for download <sup>1)</sup>; Email address required for delivery

**6AV2102-0AA07-0AH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**Technical specifications**

Article number	<b>6ES7677-2SB42-0GB0</b> CPU1515SP PC2 F
<b>General information</b>	
Product type designation	CPU 1515SP PC2 F
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	V16
<b>Installed software</b>	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP F
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Processor</b>	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
<b>Memory</b>	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 128 GB flash memory
<b>Work memory</b>	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
<b>Load memory</b>	
• integrated (on PC mass storage)	320 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Hardware configuration</b>	
Integrated power supply	Yes
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
<b>Interfaces</b>	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

### Technical specifications

Article number	<b>6ES7677-2SB42-0GB0</b> CPU1515SP PC2 F
<b>Video interfaces</b>	
• Graphics interface	1x DisplayPort
<b>1. Interface</b>	
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4

Article number	<b>6ES7677-2SB42-0GB0</b> CPU1515SP PC2 F
<b>2. Interface</b>	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
<b>3. Interface</b>	
Interface type	PROFIBUS with CM DP
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Services</b>	
- Equidistance	No
- Isochronous mode	No
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	88
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	Yes
- Switchover time on line break, typ.	200 ms
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required

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## Technical specifications

Article number	<b>6ES7677-2SB42-0GB0</b> CPU1515SP PC2 F
<b>Supported technology objects</b>	
Motion Control	Yes
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PL e
• SIL acc. to IEC 61508	SIL 3
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load

Article number	<b>6ES7677-2SB42-0GB0</b> CPU1515SP PC2 F
<b>Operating systems</b>	
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	3.8 Mbyte
<b>Peripherals/Options</b>	
SD card	Optionally for additional mass storage
<b>Dimensions</b>	
Width	160 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	0.83 kg

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology CPUs > CPU 1515SP PC2 T

### Overview



ET 200SP Open Controller CPU 1515SP PC2 T combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

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### Ordering data

#### SIMATIC ET 200SP Open Controller CPU 1515SP PC2 T

ET 200SP central module with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 128 GB CFast card; with extended Motion Control functionality

#### Type of delivery:

German, English, Chinese, Italian, French, Spanish

- CPU 1515SP PC2 T

With pre-installed WinCC RT Advanced

- CPU 1515SP PC2 T + HMI 128PT
- CPU 1515SP PC2 T + HMI 512PT
- CPU 1515SP PC2 T + HMI 2048PT

#### Accessories

**BusAdapter BA 2xRJ45** 6ES7193-6AR00-0AA0

**BusAdapter BA 2xFC** 6ES7193-6AF00-0AA0

**BusAdapter BA 2xSCRJ** 6ES7193-6AP00-0AA0

**BusAdapter BA SCRJ/RJ45** 6ES7193-6AP20-0AA0

**BusAdapter BA SCRJ/FC** 6ES7193-6AP40-0AA0

For increased vibration and EMC loads

**BusAdapter BA 2XLC** 6ES7193-6AG00-0AA0

**BusAdapter BA LC/RJ45** 6ES7193-6AG20-0AA0

**BusAdapter BA LC/FC** 6ES7193-6AG40-0AA0

**CM DP for ET 200SP CPU** 6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

**Server module** 6ES7193-6PA00-0AA0

Spare part

**Power supply connector** 6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

### Article No.

6ES7677-2VB42-0GB0

6ES7677-2VB42-0GK0

6ES7677-2VB42-0GL0

6ES7677-2VB42-0GM0

6ES7193-6AR00-0AA0

6ES7193-6AF00-0AA0

6ES7193-6AP00-0AA0

6ES7193-6AP20-0AA0

6ES7193-6AP40-0AA0

6ES7193-6AG00-0AA0

6ES7193-6AG20-0AA0

6ES7193-6AG40-0AA0

6ES7545-5DA00-0AB0

6ES7193-6PA00-0AA0

6ES7193-4JB00-0AA0

### Article No.

#### Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

#### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

#### STEP 7 Professional V17

##### Target system:

SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

##### Requirement:

- Windows 10 (64-bit)
  - Windows 10 Professional Version 1909, 2004, 20H2
  - Windows 10 Enterprise Version 1909, 2004, 20H2
  - Windows 10 IoT Enterprise 2016 LTSC
  - Windows 10 IoT Enterprise 2019 LTSC

- Windows Server (64-bit)
  - Windows Server 2016 Standard (full installation)
  - Windows Server 2019 Standard (full installation)

##### Type of delivery:

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V17, floating license

6ES7822-1AA07-0YA5

STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>

6ES7822-1AE07-0YA5

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Technical specifications																																																																																																												
<b>SIMATIC ODK 1500S</b> Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; Single License; supplied on DVD Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; Single License; software download <sup>1)</sup> Email address required for delivery Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) <sup>1)</sup> Email address required for delivery Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as of V1.0; software download including license key (floating license) <sup>1)</sup> Email address required for delivery	<b>6ES7806-2CD02-0YA0</b>  <b>6ES7806-2CD02-0YG0</b>  <b>6ES7806-2CD03-0YA0</b>  <b>6ES7806-2CD03-0YG0</b>  <b>6ES7806-2CD03-0YK0</b>	<table border="1"> <tr> <td>Article number</td> <td><b>6ES7677-2VB42-0GB0</b> CPU1515SP PC2 T</td> </tr> <tr> <td colspan="2"><b>General information</b></td> </tr> <tr> <td>Product type designation</td> <td>CPU 1515SP PC2 T</td> </tr> <tr> <td colspan="2"><b>Engineering with</b></td> </tr> <tr> <td>• STEP 7 TIA Portal configurable/integrated from version</td> <td>STEP 7 V16 or higher</td> </tr> <tr> <td colspan="2"><b>Installed software</b></td> </tr> <tr> <td>• Visualization</td> <td>No</td> </tr> <tr> <td>• Control</td> <td>S7-1500 Software Controller CPU 1505SP T</td> </tr> <tr> <td colspan="2"><b>Supply voltage</b></td> </tr> <tr> <td>Type of supply voltage</td> <td>24 V DC</td> </tr> <tr> <td colspan="2"><b>Processor</b></td> </tr> <tr> <td>Processor type</td> <td>Intel Atom E3940, 1.6 GHz, 4 cores</td> </tr> <tr> <td colspan="2"><b>Memory</b></td> </tr> <tr> <td>Type of memory</td> <td>DDR3L</td> </tr> <tr> <td>Main memory</td> <td>8 GB RAM</td> </tr> <tr> <td>CFast memory card</td> <td>Yes; 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<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology CPUs > CPU 1515SP PC2 T

### Technical specifications

Article number	<b>6ES7677-2VB42-0GB0</b> CPU1515SP PC2 T
<b>Video interfaces</b>	
• Graphics interface	1x DisplayPort
<b>1. Interface</b>	
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- PROFlenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during oper- ation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Article number	<b>6ES7677-2VB42-0GB0</b> CPU1515SP PC2 T
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- PROFlenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
<b>2. Interface</b>	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
<b>3. Interface</b>	
Interface type	PROFIBUS with CM DP
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Services</b>	
- Equidistance	No
- Isochronous mode	No
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	88
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Switchover time on line break, typ.	200 ms
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes; From SW CPU 1505SP V2.6
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required

## Technical specifications

Article number	<b>6ES7677-2VB42-0GB0</b> CPU1515SP PC2 T
<b>Supported technology objects</b>	
Motion Control	Yes
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- for each set of kinematics	30
- Per leading axis proxy	3
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules

Article number	<b>6ES7677-2VB42-0GB0</b> CPU1515SP PC2 T
<b>Operating systems</b>	
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	5.8 Mbyte
<b>Peripherals/Options</b>	
SD card	Optionally for additional mass storage
<b>Dimensions</b>	
Width	160 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	0.83 kg

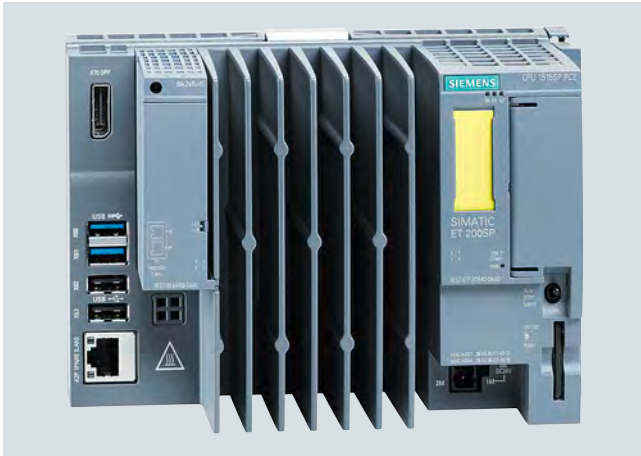
## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology CPUs > CPU 1515SP PC2 TF

### Overview



ET 200SP Open Controller, CPU 1515SP PC2 TF, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

7

### Ordering data

#### SIMATIC ET 200SP Open Controller CPU 1515SP PC2 TF

Fail-safe ET 200SP central module with Windows 10 IoT Enterprise 64-bit and pre-installed fail-safe SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 128 GB CFast card; with extended Motion Control functionality

Type of delivery:  
German, English, Chinese, Italian, French, Spanish

- CPU 1515SP PC2 TF

With pre-installed  
WinCC RT Advanced

- CPU 1515SP PC2 TF + HMI 128PT
- CPU 1515SP PC2 TF + HMI 512PT
- CPU 1515SP PC2 TF + HMI 2048PT

#### Accessories

**BusAdapter BA 2xRJ45** 6ES7193-6AR00-0AA0

**BusAdapter BA 2xFC** 6ES7193-6AF00-0AA0

**BusAdapter BA 2xSCRJ** 6ES7193-6AP00-0AA0

**BusAdapter BA SCRJ/RJ45** 6ES7193-6AP20-0AA0

**BusAdapter BA SCRJ/FC** 6ES7193-6AP40-0AA0

For increased vibration and EMC loads

**BusAdapter BA 2XLC** 6ES7193-6AG00-0AA0

**BusAdapter BA LC/RJ45** 6ES7193-6AG20-0AA0

**BusAdapter BA LC/FC** 6ES7193-6AG40-0AA0

**CM DP for ET 200SP CPU** 6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

**Server module** 6ES7193-6PA00-0AA0

Spare part

### Article No.

6ES7677-2WB42-0GB0

6ES7677-2WB42-0GK0

6ES7677-2WB42-0GL0

6ES7677-2WB42-0GM0

6ES7193-6AG00-0AA0

6ES7193-6AG20-0AA0

6ES7193-6AG40-0AA0

6ES7545-5DA00-0AB0

6ES7193-6PA00-0AA0

### Article No.

#### Power supply connector

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

6ES7193-4JB00-0AA0

#### Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

#### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

#### STEP 7 Professional V17

Target system:  
SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

Requirement:

- Windows 10 (64-bit)
  - Windows 10 Professional Version 1909, 2004, 20H2
  - Windows 10 Enterprise Version 1909, 2004, 20H2
  - Windows 10 IoT Enterprise 2016 LTSC
  - Windows 10 IoT Enterprise 2019 LTSC

Windows Server (64-bit)
 

- Windows Server 2016 Standard (full installation)
- Windows Server 2019 Standard (full installation)

Type of delivery:  
9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V17, floating license

6ES7822-1AA07-0YA5

STEP 7 Professional V17, floating license, software download including license key <sup>1)</sup>

6ES7822-1AE07-0YA5

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



Ordering data	Article No.	Technical specifications
<p><b>SIMATIC ODK 1500S</b></p> <p>Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; Single License; supplied on DVD</p> <p>Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; Single License; software download <sup>1)</sup></p> <p>Email address required for delivery</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) <sup>1)</sup></p> <p>Email address required for delivery</p> <p>Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as of V1.0; software download including license key (floating license) <sup>1)</sup></p> <p>Email address required for delivery</p>	<p><b>6ES7806-2CD02-0YA0</b></p> <p><b>6ES7806-2CD02-0YG0</b></p> <p><b>6ES7806-2CD03-0YA0</b></p> <p><b>6ES7806-2CD03-0YG0</b></p> <p><b>6ES7806-2CD03-0YK0</b></p>	<p>Article number <b>6ES7677-2WB42-0GB0</b> CPU1515SP PC2 TF</p> <p><b>General information</b></p> <p>Product type designation CPU 1515SP PC2 TF</p> <p><b>Engineering with</b></p> <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version STEP 7 V16 or higher</li> </ul> <p><b>Installed software</b></p> <ul style="list-style-type: none"> <li>Visualization No</li> <li>Control S7-1500 Software Controller CPU 1505SP TF</li> </ul> <p><b>Supply voltage</b></p> <p>Type of supply voltage 24 V DC</p> <p><b>Processor</b></p> <p>Processor type Intel Atom E3940, 1.6 GHz, 4 cores</p> <p><b>Memory</b></p> <p>Type of memory DDR3L</p> <p>Main memory 8 GB RAM</p> <p>CFast memory card Yes; 128 GB flash memory</p> <p><b>Work memory</b></p> <ul style="list-style-type: none"> <li>integrated (for program) 1.5 Mbyte</li> <li>integrated (for data) 5 Mbyte</li> <li>integrated (for CPU function library of CPU Runtime) 20 Mbyte</li> </ul> <p><b>Load memory</b></p> <ul style="list-style-type: none"> <li>integrated (on PC mass storage) 320 Mbyte</li> </ul> <p><b>CPU processing times</b></p> <p>for bit operations, typ. 10 ns</p> <p>for word operations, typ. 12 ns</p> <p>for fixed point arithmetic, typ. 16 ns</p> <p>for floating point arithmetic, typ. 64 ns</p> <p><b>Counters, timers and their retentivity</b></p> <p><b>S7 counter</b></p> <ul style="list-style-type: none"> <li>Number 2 048</li> </ul> <p><b>IEC counter</b></p> <ul style="list-style-type: none"> <li>Number Any (only limited by the main memory)</li> </ul> <p><b>S7 times</b></p> <ul style="list-style-type: none"> <li>Number 2 048</li> </ul> <p><b>IEC timer</b></p> <ul style="list-style-type: none"> <li>Number Any (only limited by the main memory)</li> </ul> <p><b>Data areas and their retentivity</b></p> <p><b>Flag</b></p> <ul style="list-style-type: none"> <li>Size, max. 16 kbyte</li> </ul> <p><b>Address area</b></p> <p><b>I/O address area</b></p> <ul style="list-style-type: none"> <li>Inputs 32 kbyte; All inputs are in the process image</li> <li>Outputs 32 kbyte; All outputs are in the process image</li> </ul> <p><b>Hardware configuration</b></p> <p>Integrated power supply Yes</p> <p><b>Time of day</b></p> <p><b>Clock</b></p> <ul style="list-style-type: none"> <li>Type Hardware clock</li> <li>Hardware clock (real-time) Yes; Resolution: 1 s</li> </ul> <p><b>Interfaces</b></p> <p>Number of industrial Ethernet interfaces 2</p> <p>Number of RS 485 interfaces 1; Via CM DP module</p> <p>Number of USB interfaces 4; 2x USB 2.0, 2x USB 3.0 on front side</p> <p>Number of SD card slots 1</p>
<p><b>WinCC Advanced V17</b></p> <p>Engineering software in the TIA Portal; in 6 languages: de, en, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime</p> <ul style="list-style-type: none"> <li>Floating license; software and documentation on DVD; license key on USB flash drive</li> <li>Floating license; software, documentation and license key for download <sup>1)</sup>; Email address required for delivery</li> </ul>	<p><b>6AV2102-0AA07-0AA5</b></p> <p><b>6AV2102-0AA07-0AH5</b></p>	

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology CPUs > CPU 1515SP PC2 TF

### Technical specifications

Article number	<b>6ES7677-2WB42-0GB0</b> CPU1515SP PC2 TF
<b>Video interfaces</b>	
• Graphics interface	1x DisplayPort
<b>1. Interface</b>	
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- PROFINergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Article number	<b>6ES7677-2WB42-0GB0</b> CPU1515SP PC2 TF
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- PROFINergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
<b>2. Interface</b>	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
<b>3. Interface</b>	
Interface type	PROFIBUS with CM DP
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Services</b>	
- Equidistance	No
- Isochronous mode	No
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	88
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Switchover time on line break, typ.	200 ms
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes; From SW CPU 1505SP V2.6
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required

## Technical specifications

Article number	<b>6ES7677-2WB42-0GB0</b> CPU1515SP PC2 TF
<b>Supported technology objects</b>	
Motion Control	Yes
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- for each set of kinematics	30
- Per leading axis proxy	3
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PL e
• SIL acc. to IEC 61508	SIL 3
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules

Article number	<b>6ES7677-2WB42-0GB0</b> CPU1515SP PC2 TF
<b>Operating systems</b>	
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSP, 64bit, MUI
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	5.8 Mbyte
<b>Peripherals/Options</b>	
SD card	Optionally for additional mass storage
<b>Dimensions</b>	
Width	160 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	0.83 kg

## Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2

### Overview



SIPLUS ET 200SP Open Controller, SIPLUS CPU 1515SP PC2, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the SIPLUS ET 200SP system, the SIPLUS S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a SIPLUS ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

#### Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS ET 200SP Open Controller CPU 1515SP PC2

(Extended temperature range and exposure to environmental substances)

SIPLUS ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Software Controller; 8 GB RAM, 30 GB CFast card

Type of delivery:  
English, German, Chinese, Italian, French, Spanish

- SIPLUS CPU 1515SP PC2

**6AG1677-2DB42-2GB0**

Spare part, without CFast card

- SIPLUS CPU 1515SP PC2

**6AG1677-2DB40-2AA0**

#### Accessories

##### BusAdapter BA 2xRJ45

**6AG1193-6AR00-7AA0**

(Extended temperature range and exposure to environmental substances)

##### SIPLUS BusAdapter BA 2xFC

**6AG1193-6AF00-7AA0**

(Extended temperature range and exposure to environmental substances)

##### BusAdapter BA 2xSCRJ

**6AG1193-6AP00-2AA0**

(Extended temperature range and exposure to environmental substances)

##### BusAdapter BA 2xLC

**6AG1193-6AG00-2AA0**

(Extended temperature range and exposure to environmental substances)

##### SIPLUS Mounting Kit ET 200SP

**6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter BA 2xRJ45

#### Other accessories

See SIMATIC CPU 1515SP PC2, page 7/26

## Technical specifications

Article number	6AG1677-2DB42-2GB0	6AG1677-2DB40-2AA0
Based on	6ES7677-2DB42-0GB0	6ES7677-2DB40-0AA0
	SIPLUS ET 200SP CPU1515SP PC2	SIPLUS ET 200SP CPU1515SP PC2
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>	-40 °C; = Tmin Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules -40 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax; with max. 32 ET 200SP modules	-40 °C; = Tmin Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules -40 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax; with max. 32 ET 200SP modules
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> <li>Against mechanical environmental conditions acc. to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> <li>Against mechanical environmental conditions acc. to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

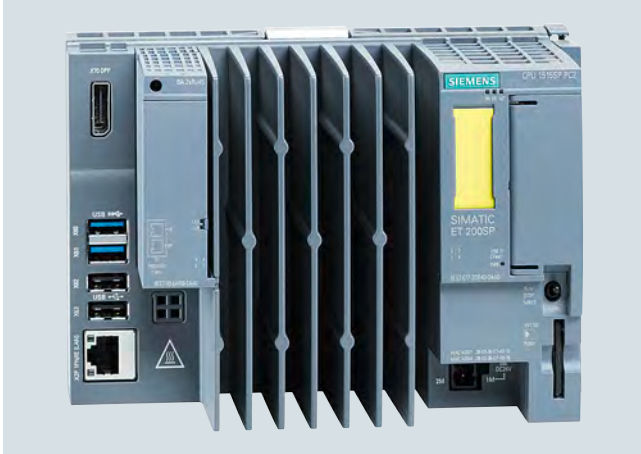
## Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS fail-safe CPUs > SIPLUS CPU 1515SP PC2 F

### Overview



SIPLUS ET 200SP Open Controller, SIPLUS CPU 1515SP PC2 F, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the SIPLUS ET 200SP system, the SIPLUS S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a SIPLUS ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

#### Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS ET 200SP Open Controller CPU 1515SP PC2 F

(Extended temperature range and exposure to environmental substances)

Fail-safe ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Failsafe Software Controller (with WinCC RT Advanced option); 8 GB RAM, 30 GB CFast card;

Type of delivery: English, German, Chinese, Italian, French, Spanish

- SIPLUS CPU 1515SP PC2 F

**6AG1677-2SB42-2GB0**

#### Accessories

##### BusAdapter BA 2xRJ45

(Extended temperature range and exposure to environmental substances)

**6AG1193-6AR00-7AA0**

##### SIPLUS BusAdapter BA 2xFC

(Extended temperature range and exposure to environmental substances)

**6AG1193-6AF00-7AA0**

##### BusAdapter BA 2xSCRJ

(Extended temperature range and exposure to environmental substances)

**6AG1193-6AP00-2AA0**

##### BusAdapter BA 2xLC

(Extended temperature range and exposure to environmental substances)

**6AG1193-6AG00-2AA0**

##### SIPLUS Mounting Kit ET 200SP

Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter BA 2xRJ45

**6AG1193-6AA00-0AA0**

#### Other accessories

See SIMATIC CPU 1515SP PC2 F, page 7/30

## Technical specifications

Article number	6AG1677-2SB42-2GB0	Article number	6AG1677-2SB42-2GB0
Based on	6ES7677-2SB42-0GB0 SIPLUS ET 200SP CPU1515SP PC2 F	Based on	6ES7677-2SB42-0GB0 SIPLUS ET 200SP CPU1515SP PC2 F
<b>Ambient conditions</b>		<b>Use on ships/at sea</b>	
<b>Ambient temperature during operation</b>		<ul style="list-style-type: none"> <li>- to biologically active substances according to EN 60721-3-6</li> <li>- to chemically active substances according to EN 60721-3-6</li> <li>- to mechanically active substances according to EN 60721-3-6</li> <li>- Against mechanical environmental conditions acc. to EN 60721-3-6</li> </ul>	
• min.	-40 °C; = Tmin	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	Yes; Class 6S3 incl. sand, dust; *	
• horizontal installation, max.	60 °C; = Tmax	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
• vertical installation, min.	-40 °C; = Tmin		
• vertical installation, max.	50 °C; = Tmax; with max. 32 ET 200SP modules		
<b>Altitude during operation relating to sea level</b>		<b>Usage in industrial process technology</b>	
• Installation altitude above sea level, max.	2 000 m	<ul style="list-style-type: none"> <li>- Against chemically active substances acc. to EN 60654-4</li> <li>- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)		
<b>Relative humidity</b>		<b>Remark</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	<ul style="list-style-type: none"> <li>- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Resistance</b>		<b>Conformal coating</b>	
<b>Coolants and lubricants</b>		<ul style="list-style-type: none"> <li>• Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>• Protection against fouling acc. to EN 60664-3</li> <li>• Military testing according to MIL-I-46058C, Amendment 7</li> <li>• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability  Yes; Type 1 protection  Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A
<ul style="list-style-type: none"> <li>- Resistant to commercially available coolants and lubricants</li> </ul>		Yes; Incl. diesel and oil droplets in the air	
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>- to biologically active substances according to EN 60721-3-3</li> <li>- to chemically active substances according to EN 60721-3-3</li> <li>- to mechanically active substances according to EN 60721-3-3</li> <li>- Against mechanical environmental conditions acc. to EN 60721-3-3</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> <li>Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</li> </ul>		

## Distributed Controllers

based on ET 200Pro  
Standard CPUs

### IM 154-8 PN/DP CPU

#### Overview



- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Interface module for exchanging pre-processed I/O data between the ET 200pro and a higher-level master/IO controller via PROFIBUS DP/PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- Component-based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component-based Automation (CBA)
- PROFINET interface with 3-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integrated web server with the option of creating user-defined web pages
- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Fail-safe IM 154-8F PN/DP CPU PROFIsafe available

#### Note

SIMATIC Micro Memory Card required for operation of CPU.

#### Ordering data

#### Article No.

##### IM 154-8 PN/DP CPU interface module, V3.2

PROFINET IO controller for operating distributed I/Os on PROFINET, with integrated PLC functionality.

6ES7154-8AB01-0AB0

#### Accessories

##### MMC 64 KB <sup>1)</sup>

For program backup.

6ES7953-8LF31-0AA0

##### MMC 128 KB <sup>1)</sup>

For program backup.

6ES7953-8LG31-0AA0

##### MMC 512 KB <sup>1)</sup>

For program backup.

6ES7953-8LJ31-0AA0

##### MMC 2 MB <sup>1)</sup>

For program backup and/or firmware updates.

6ES7953-8LL31-0AA0

##### MMC 4 MB <sup>1)</sup>

For program backup.

6ES7953-8LM32-0AA0

##### MMC 8 MB <sup>1)</sup>

For program backup.

6ES7953-8LP31-0AA0

#### Terminal module

For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.

6ES7194-4AN00-0AA0

#### SCALANCE X-200 Industrial Ethernet switches

With integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbps M12 ports, incl. eleven M12 dust caps.

6GK5208-0HA10-2AA6

#### Article No.

##### Industrial Ethernet FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

##### Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10  
6XV1840-3AH10  
6XV1840-4AH10

##### Industrial Ethernet FastConnect installation cables

- IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.
- IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.

6XV1870-2D

6XV1870-2F

##### Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

<sup>1)</sup> An MMC is essential for operating the CPU



Ordering data	Article No.	Article No.
<b>IE connecting cable M12-180/M12-180</b> <ul style="list-style-type: none"> <li>Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:           <ul style="list-style-type: none"> <li>- 0.3 m</li> <li>- 0.5 m</li> <li>- 1.0 m</li> <li>- 1.5 m</li> <li>- 2.0 m</li> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> <li>- 15 m</li> </ul> </li> <li>PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 connectors (male insert), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> <li>PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 connector (male insert at one end, other end open), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> </ul>	<b>6XV1870-8AE30</b> <b>6XV1870-8AE50</b> <b>6XV1870-8AH10</b> <b>6XV1870-8AH15</b> <b>6XV1870-8AH20</b> <b>6XV1870-8AH30</b> <b>6XV1870-8AH50</b> <b>6XV1870-8AN10</b> <b>6XV1870-8AN15</b>	<b>7/8" connecting cable to power supply</b> <ul style="list-style-type: none"> <li>5-wire, 5 x 1.5 mm<sup>2</sup>, trailing type, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:           <ul style="list-style-type: none"> <li>- 1.5 m</li> <li>- 2.0 m</li> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> <li>- 15 m</li> <li>- Other special lengths with 90° or 180° cable outlet.</li> </ul> </li> <li>Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, pre-assembled at both ends with 7/8" angled connectors (female insert at one end, male insert at the other end), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> <li>Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, pre-assembled at one end with 7/8" angled connector with female insert (female insert at one end, other end open), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> </ul>
<b>IE FC M12 Plug PRO</b> PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. <ul style="list-style-type: none"> <li>1 unit</li> <li>8 units</li> <li>PROFINET M12 plug connector, D-coded, angled.</li> </ul>	<b>6GK1901-0DB20-6AA0</b> <b>6GK1901-0DB20-6AA8</b> <b>3RK1902-2DA00</b>	<b>6XV1822-5BH15</b> <b>6XV1822-5BH20</b> <b>6XV1822-5BH30</b> <b>6XV1822-5BH50</b> <b>6XV1822-5BN10</b> <b>6XV1822-5BN15</b> See: <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a>
<b>IE panel feed-through</b> Cabinet feed-through for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	<b>6GK1901-0DM20-2AA5</b>	<b>3RK1902-3NB30</b> <b>3RK1902-3NB50</b> <b>3RK1902-3NC10</b>
		<b>Power line</b> 5-wire, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.
		<b>7/8" connection plug</b> For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> <li>with male insert, 5-pack</li> <li>with female insert, 5-pack</li> <li>angled, with female insert, 1 unit</li> <li>angled, with male insert, 1 unit</li> </ul> 7/8" cover cap, 10 per pack
		<b>6XV1830-8AH10</b>
		<b>6GK1905-0FA00</b> <b>6GK1905-0FB00</b> <b>3RK1902-3DA00</b> <b>3RK1902-3BA00</b> <b>6ES7194-3JA00-0AA0</b>
		<b>Twisted pair cables 4x2 with RJ45 connectors</b> 0.5 m 1 m 2 m 6 m 10 m
		<b>6XV1870-3QE50</b> <b>6XV1870-3QH10</b> <b>6XV1870-3QH20</b> <b>6XV1870-3QH60</b> <b>6XV1870-3QN10</b>
		<b>Crossed twisted pair cables 4x2 with RJ45 connectors</b> 0.5 m 1 m 2 m 6 m 10 m
		<b>6XV1870-3RE50</b> <b>6XV1870-3RH10</b> <b>6XV1870-3RH20</b> <b>6XV1870-3RH60</b> <b>6XV1870-3RN10</b>

## Distributed Controllers

based on ET 200Pro

Standard CPUs

### IM 154-8 PN/DP CPU

Ordering data	Article No.	Ordering data	Article No.
<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro	<b>3RX9802-0AA00</b>	<b>PROFIBUS FC standard cable GP</b> Standard type with special design for fast mounting, 2-wire, shielded.	<b>6XV1830-0EH10</b>
<b>M12 sealing caps with female thread</b> 5 units	<b>6ES7194-4JD60-0AA0</b>	Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.	
<b>PROFIBUS M12 connecting cable</b> Pre-assembled, with two 5-pin M12 connectors/sockets, up to 100 m, in various lengths: 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m Other special lengths with 90° or 180° cable outlet	<b>6XV1830-3DH15</b> <b>6XV1830-3DH20</b> <b>6XV1830-3DH30</b> <b>6XV1830-3DH50</b> <b>6XV1830-3DN10</b> <b>6XV1830-3DN15</b> See <a href="http://support.automation.siemens.com/WWW/view/en/26999294">http://support.automation.siemens.com/WWW/view/en/26999294</a>	<b>PROFIBUS FC trailing cable</b> 2-wire, shielded.	<b>6XV1830-3EH10</b>
<b>M12 bus termination connector for PROFIBUS, female insert</b>	<b>6GK1905-0ED00</b>	<b>PROFIBUS FC food cable</b> 2-wire, shielded. Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.	<b>6XV1830-0GH10</b>
<b>M12 bus termination connector for PROFIBUS, male insert</b>	<b>6GK1905-0EC00</b>	<b>PROFIBUS FC robust cable</b> 2-wire, shielded Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.	<b>6XV1830-0JH10</b>
<b>M12 plug connector, axial outlet, with male insert</b>	<b>6GK1905-0EA00</b>	<b>PROFIBUS M12 connection plug</b> 5-pin, B-coded, metal housing, 1 pack = 5 units. • Female insert	<b>6GK1905-0EB00</b>

### Technical specifications

Article number	<b>6ES7154-8AB01-0AB0</b> ET 200pro: IM 154-8 PN/DP CPU, 384KB
<b>General information</b>	
<b>Product function</b> • Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface
<b>Supply voltage</b> Rated value (DC)	24 V
<b>Power loss</b> Power loss, typ.	8.5 W
<b>Memory</b>	
<b>Work memory</b> • integrated • expandable	384 kbyte No
<b>Load memory</b> • Plug-in (MMC), max.	8 Mbyte
<b>CPU processing times</b> for bit operations, typ. for word operations, typ. for fixed point arithmetic, typ. for floating point arithmetic, typ.	0.05 µs 0.09 µs 0.12 µs 0.45 µs
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b> • Number	256
<b>IEC counter</b> • present	Yes
<b>S7 times</b> • Number	256
<b>IEC timer</b> • present	Yes

Article number	<b>6ES7154-8AB01-0AB0</b> ET 200pro: IM 154-8 PN/DP CPU, 384KB
<b>Data areas and their retentivity</b>	
<b>Flag</b> • Size, max.	2 048 byte
<b>Address area</b>	
<b>I/O address area</b> • Inputs • Outputs	2 048 byte 2 048 byte
<b>Process image</b> • Inputs, adjustable • Outputs, adjustable	2 048 byte 2 048 byte
<b>Time of day</b>	
<b>Clock</b> • Hardware clock (real-time)	Yes
<b>Operating hours counter</b> • Number	1
<b>Interfaces</b> Interfaces/bus type	1x MPI/PROFIBUS DP, 1x PROFINET (3 ports)
<b>1. Interface</b> Interface type	Integrated RS 485 interface
<b>Interface types</b> • RS 485	Yes
<b>Protocols</b> • MPI • PROFIBUS DP master • PROFIBUS DP slave • Point-to-point connection	Yes Yes Yes No
<b>PROFIBUS DP master</b> • Number of DP slaves, max.	124

**Technical specifications**

Article number	<b>6ES7154-8AB01-0AB0</b> ET 200pro: IM 154-8 PN/DP CPU, 384KB
<b>2. Interface</b>	
<b>Interface types</b>	
• Number of ports	3
<b>Protocols</b>	
• MPI	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- Number of IO Devices with IRT and the option "high flexibility"	128
- Number of connectable IO Devices for RT, max.	128
<b>Protocols</b>	
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>Open IE communication</b>	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• ISO-on-TCP (RFC1006)	Yes
- Number of connections, max.	8
• UDP	Yes
- Number of connections, max.	8
<b>Web server</b>	
• supported	Yes

Article number	<b>6ES7154-8AB01-0AB0</b> ET 200pro: IM 154-8 PN/DP CPU, 384KB
<b>Communication functions</b>	
PG/OP communication	Yes
<b>Global data communication</b>	
• supported	Yes
<b>S7 basic communication</b>	
• supported	Yes
<b>S7 communication</b>	
• supported	Yes
<b>Number of connections</b>	
• overall	16
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	135 mm
Height	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
<b>Weights</b>	
Weight, approx.	720 g

## Distributed Controllers

based on ET 200Pro  
Standard CPUs

### CPU 1513pro-2 PN

#### Overview



- CPU 1513pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements on the program scope and processing speed, for distributed setup via PROFINET IO.
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA Server and Client (data access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

#### Note

SIMATIC Memory Card required for operation of the CPU.

#### Ordering data

#### Article No.

##### CPU 1513pro-2 PN

300 KB work memory for program,  
1.5 MB for data,  
PROFINET IO IRT interface,  
PROFINET IO RT interface,  
SIMATIC Memory Card required

6ES7513-2PL00-0AB0

##### Accessories

##### SIMATIC Memory Card

- 4 MB<sup>1)</sup>
- 12 MB<sup>1)</sup>
- 24 MB<sup>1)</sup>
- 256 MB<sup>1)</sup>
- 2 GB<sup>1)</sup>
- 32 GB<sup>1)</sup>

6ES7954-8LC03-0AA0  
6ES7954-8LE03-0AA0  
6ES7954-8LF03-0AA0  
6ES7954-8LL03-0AA0  
6ES7954-8LP03-0AA0  
6ES7954-8LT03-0AA0

##### Connection module

CM CPU 2PN M12 / 7/8";  
With 3 x M12 and 2 x 7/8",  
for connecting 2 x PROFINET

6ES7194-4AP00-0AA0

##### Industrial Ethernet FC RJ45 plug 180

RJ45 plug connector for  
Industrial Ethernet with a rugged  
metal enclosure and integrated  
insulation displacement contacts  
for connecting Industrial Ethernet  
FC installation cables;  
with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

##### Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10  
6XV1840-3AH10  
6XV1840-4AH10

##### Industrial Ethernet FastConnect installation cables

- IE FC TP trailing cable GP 2 x 2;  
sold by the meter, max. delivery  
unit 1 000 m;  
minimum order quantity 20 m.
- IE TP torsion cable GP 2 x 2;  
sold by the meter, max. delivery  
unit 1 000 m;  
minimum order quantity 20 m.

6XV1870-2D  
  
6XV1870-2F

##### Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

<sup>1)</sup> An MMC is essential for operating the CPU

## Ordering data

## Article No.

## Article No.

**IE connecting cable  
M12-180/M12-180**

- Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:

- 0.3 m  
- 0.5 m  
- 1.0 m  
- 1.5 m  
- 2.0 m  
- 3.0 m  
- 5.0 m  
- 10 m  
- 15 m

- PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths:

- 3.0 m  
- 5.0 m  
- 10 m

- PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths:

- 3.0 m  
- 5.0 m  
- 10 m

6XV1870-8AE30  
6XV1870-8AE50  
6XV1870-8AH10  
6XV1870-8AH15  
6XV1870-8AH20  
6XV1870-8AH30  
6XV1870-8AH50  
6XV1870-8AN10  
6XV1870-8AN15

3RK1902-2NB30  
3RK1902-2NB50  
3RK1902-2NC10

3RK1902-2HB30  
3RK1902-2HB50  
3RK1902-2HC10

**IE FC M12 plug PRO**

PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.

- 1 unit
- 8 units
- PROFINET M12 plug connector, D-coded, angled.

6GK1901-0DB20-6AA0  
6GK1901-0DB20-6AA8  
3RK1902-2DA00

**IE panel feedthrough**

Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.

6GK1901-0DM20-2AA5

**7/8" connecting cable to  
power supply**

- 5-wire, 5 x 1.5 mm<sup>2</sup>, trailing, pre-assembled with two 7/8" plugs (axial cable outlet), 5-pin, up to 50 m, in various lengths:

- 1.5 m  
- 2.0 m  
- 3.0 m  
- 5.0 m  
- 10 m  
- 15 m  
- Other special lengths with 90° or 180° cable outlet.

6XV1822-5BH15  
6XV1822-5BH20  
6XV1822-5BH30  
6XV1822-5BH50  
6XV1822-5BN10  
6XV1822-5BN15

See

<http://support.automation.siemens.com/WWW/view/en/26999294>

- Trailing power cable, 5 x 1.5 mm<sup>2</sup>, pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths:

- 3.0 m  
- 5.0 m  
- 10 m

3RK1902-3NB30  
3RK1902-3NB50  
3RK1902-3NC10

- Trailing power cable, 5 x 1.5 mm<sup>2</sup>, pre-assembled at one end with 7/8" angled plug with female contact insert (female contact insert at one end, other end open), in various lengths:

- 3.0 m  
- 5.0 m  
- 10 m

3RK1902-3GB30  
3RK1902-3GB50  
3RK1902-3GC10

**Power line**

5-wire, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.

6XV1830-8AH10

**7/8" connection plug**

For ET 200eco, with axial cable outlet

- With male contact insert, 5-pack
- With female contact insert, 5-pack
- Angled, with female contact insert, 1 unit
- Angled, with male contact insert, 1 unit

6GK1905-0FA00  
6GK1905-0FB00  
3RK1902-3DA00  
3RK1902-3BA00

7/8" cover cap, 10 per pack

6ES7194-3JA00-0AA0

**Twisted pair cables 4x2  
with RJ45 plugs**

0.5 m  
1 m  
2 m  
6 m  
10 m

6XV1870-3QE50  
6XV1870-3QH10  
6XV1870-3QH20  
6XV1870-3QH60  
6XV1870-3QN10

**Crossed twisted pair cables 4x2  
with RJ45 plugs**

0.5 m  
1 m  
2 m  
6 m  
10 m

6XV1870-3RE50  
6XV1870-3RH10  
6XV1870-3RH20  
6XV1870-3RH60  
6XV1870-3RN10

**M12 sealing cap**

For protection of unused M12 connections with ET 200pro

3RX9802-0AA00

**M12 sealing caps  
with female thread**

5 units

6ES7194-4JD60-0AA0

# Distributed Controllers

based on ET 200Pro  
Standard CPUs

## CPU 1513pro-2 PN

### Technical specifications

Article number	<b>6ES7513-2PL00-0AB0</b> ET 200pro: CPU 1513pro-2 PN
<b>General information</b>	
Product type designation	CPU 1513pro-2 PN
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V16 (FW V2.8) or higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	300 kbyte
• integrated (for data)	1.5 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	40 ns
for word operations, typ.	48 ns
for fixed point arithmetic, typ.	64 ns
for floating point arithmetic, typ.	256 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

Article number	<b>6ES7513-2PL00-0AB0</b> ET 200pro: CPU 1513pro-2 PN
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
<b>2. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No

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## Technical specifications

Article number	<b>6ES7513-2PL00-0AB0</b> ET 200pro: CPU 1513pro-2 PN
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFinergy	Yes
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	128; Via integrated interfaces of the CPU
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes

Article number	<b>6ES7513-2PL00-0AB0</b> ET 200pro: CPU 1513pro-2 PN
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
<b>Controller</b>	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
<b>Counting and measuring</b>	
• High-speed counter	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	135 mm
Height	130 mm
Depth	65 mm
<b>Weights</b>	
Weight, approx.	614 g

## Distributed Controllers

based on ET 200Pro  
Standard CPUs

### CPU 1516pro-2 PN

#### Overview



- CPU 1516pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA Server and Client (Data Access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

#### Note

SIMATIC Memory Card required for operation of the CPU

#### Ordering data

#### Article No.

**CPU 1516pro-2 PN** **6ES7516-2PN00-0AB0**

1 MB work memory for program,  
5 MB for data,  
PROFINET IO IRT interface,  
PROFINET IO RT interface;  
SIMATIC Memory Card required

#### Accessories

##### SIMATIC Memory Card

4 MB <sup>1)</sup>	<b>6ES7954-8LC03-0AA0</b>
12 MB <sup>1)</sup>	<b>6ES7954-8LE03-0AA0</b>
24 MB <sup>1)</sup>	<b>6ES7954-8LF03-0AA0</b>
256 MB <sup>1)</sup>	<b>6ES7954-8LL03-0AA0</b>
2 GB <sup>1)</sup>	<b>6ES7954-8LP03-0AA0</b>
32 GB <sup>1)</sup>	<b>6ES7954-8LT03-0AA0</b>

##### Connection module

**6ES7194-4AP00-0AA0**

CM CPU 2PN M12 / 7/8";  
With 3 x M12 and 2 x 7/8",  
for connecting 2 x PROFINET

##### Industrial Ethernet FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

##### Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

**6XV1840-2AH10**  
**6XV1840-3AH10**  
**6XV1840-4AH10**

##### Industrial Ethernet FastConnect installation cables

- IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.
- IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.

**6XV1870-2D**  
**6XV1870-2F**

##### Industrial Ethernet FastConnect

Stripping tool

**6GK1901-1GA00**

<sup>1)</sup> An MMC is essential for operating the CPU



Ordering data	Article No.	Article No.
<b>IE connecting cable M12-180/M12-180</b> <ul style="list-style-type: none"> <li>Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:           <ul style="list-style-type: none"> <li>- 0.3 m</li> <li>- 0.5 m</li> <li>- 1.0 m</li> <li>- 1.5 m</li> <li>- 2.0 m</li> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> <li>- 15 m</li> </ul> </li> <li>PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> <li>PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plugs (male contact insert at one end, other end open), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> </ul>	<b>6XV1870-8AE30</b> <b>6XV1870-8AE50</b> <b>6XV1870-8AH10</b> <b>6XV1870-8AH15</b> <b>6XV1870-8AH20</b> <b>6XV1870-8AH30</b> <b>6XV1870-8AH50</b> <b>6XV1870-8AN10</b> <b>6XV1870-8AN15</b>	<ul style="list-style-type: none"> <li>Trailing power cable, 5 x 1.5 mm<sup>2</sup>, pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> <li>Trailing power cable, 5 x 1.5 mm<sup>2</sup>, pre-assembled at one end with 7/8" angled plug with female contact insert (female contact insert at one end, other end open), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> </ul>
<b>IE FC M12 plug PRO</b> PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. <ul style="list-style-type: none"> <li>1 unit</li> <li>8 units</li> <li>PROFINET M12 plug connector, D-coded, angled.</li> </ul>	<b>6GK1901-0DB20-6AA0</b> <b>6GK1901-0DB20-6AA8</b> <b>3RK1902-2DA00</b>	<b>Power line</b> 5-wire, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.
<b>IE panel feedthrough</b> Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	<b>6GK1901-0DM20-2AA5</b>	<b>7/8" connection plug</b> For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> <li>With male contact insert, 5-pack</li> <li>With female contact insert, 5-pack</li> <li>Angled, with female contact insert, 1 unit</li> <li>Angled, with male contact insert, 1 unit</li> </ul>
<b>7/8" connecting cable to power supply</b> <ul style="list-style-type: none"> <li>5-wire, 5 x 1.5 mm<sup>2</sup>, trailing, pre-assembled with two 7/8" plugs (axial cable outlet), 5-pin, up to 50 m, in various lengths:           <ul style="list-style-type: none"> <li>- 1.5 m</li> <li>- 2.0 m</li> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> <li>- 15 m</li> </ul> </li> <li>Other special lengths with 90° or 180° cable outlet.</li> </ul>	<b>6XV1822-5BH15</b> <b>6XV1822-5BH20</b> <b>6XV1822-5BH30</b> <b>6XV1822-5BH50</b> <b>6XV1822-5BN10</b> <b>6XV1822-5BN15</b> See <a href="http://support.automation.siemens.com/WWW/view/en/26999294">http://support.automation.siemens.com/WWW/view/en/26999294</a>	7/8" cover cap, 10 per pack <b>6ES7194-3JA00-0AA0</b>
		<b>Twisted pair cables 4x2 with RJ45 plugs</b> <ul style="list-style-type: none"> <li>0.5 m</li> <li>1 m</li> <li>2 m</li> <li>6 m</li> <li>10 m</li> </ul>
		<b>Crossed twisted pair cables 4x2 with RJ45 plugs</b> <ul style="list-style-type: none"> <li>0.5 m</li> <li>1 m</li> <li>2 m</li> <li>6 m</li> <li>10 m</li> </ul>
		<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro
		<b>M12 sealing caps with female thread</b> 5 units
		<b>6XV1870-3QE50</b> <b>6XV1870-3QH10</b> <b>6XV1870-3QH20</b> <b>6XV1870-3QH60</b> <b>6XV1870-3QN10</b>
		<b>6XV1870-3RE50</b> <b>6XV1870-3RH10</b> <b>6XV1870-3RH20</b> <b>6XV1870-3RH60</b> <b>6XV1870-3RN10</b>
		<b>3RK1902-3NB30</b> <b>3RK1902-3NB50</b> <b>3RK1902-3NC10</b>
		<b>3RK1902-3GB30</b> <b>3RK1902-3GB50</b> <b>3RK1902-3GC10</b>
		<b>6XV1830-8AH10</b>
		<b>6GK1905-0FA00</b> <b>6GK1905-0FB00</b> <b>3RK1902-3DA00</b> <b>3RK1902-3BA00</b>

# Distributed Controllers

based on ET 200Pro  
Standard CPUs

## CPU 1516pro-2 PN

### Technical specifications

Article number	<b>6ES7516-2PN00-0AB0</b> ET 200pro: CPU 1516PRO-2 PN
<b>General information</b>	
Product type designation	CPU 1516pro-2 PN
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V14 (FW V2.0) or higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	1 Mbyte
• integrated (for data)	5 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

Article number	<b>6ES7516-2PN00-0AB0</b> ET 200pro: CPU 1516PRO-2 PN
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-I, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
<b>2. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No

## Technical specifications

Article number	<b>6ES7516-2PN00-0AB0</b> ET 200pro: CPU 1516PRO-2 PN
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFinergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	128; Via integrated interfaces of the CPU
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes

Article number	<b>6ES7516-2PN00-0AB0</b> ET 200pro: CPU 1516PRO-2 PN
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
<b>Controller</b>	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
<b>Counting and measuring</b>	
• High-speed counter	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	135 mm
Height	130 mm
Depth	65 mm
<b>Weights</b>	
Weight, approx.	614 g

## Distributed Controllers

based on ET 200Pro

Fail-safe CPUs

### IM 154-8 F PN/DP CPU

#### Overview



- Interface module for SIMATIC ET 200pro with integrated fail-safe CPU
- CPU with PLC functionality equivalent to CPU S7-315F PN/DP; with distributed intelligence for preprocessing
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and PL e according to ISO 13849.1:2006
- For high-performance control solutions in ET 200pro
- Increase in availability of systems and machines
- Integral web server with the option of creating user-defined web pages
- Isochronous mode on PROFIBUS or PROFINET
- PROFINET IO controller for up to 128 IO devices
- PROFINET interface with integrated 3-port switch
- With multiple communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)

#### Note:

SIMATIC Micro Memory Card required for operation of CPU.

#### Ordering data

#### Article No.

##### IM 154-8 F PN/DP CPU interface module, V3.2

Fail-safe PROFINET IO controller for operating distributed I/O on PROFINET, with integrated PLC functionality.

- 512 KB work memory
- 1.5 MB work memory

**6ES7154-8FB01-0AB0**  
**6ES7154-8FX00-0AB0**

##### S7 Distributed Safety V5.4 SP5 Update 2 programming tool

#### Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

#### Requirement:

Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version

Floating license for 1 user; software and documentation on DVD; license key on USB flash drive

**6ES7833-1FC02-0YA5**

Floating license for 1 user; software, documentation and license key for download<sup>1)</sup>; Email address required for delivery

**6ES7833-1FC02-0YH5**

##### S7 Distributed Safety upgrade

From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive

**6ES7833-1FC02-0YE5**

##### STEP 7 Safety Advanced V17

#### Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

#### Requirement:

STEP 7 Professional V17

#### Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

**6ES7833-1FA17-0YA5**

Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery

**6ES7833-1FA17-0YH5**

<sup>1)</sup> For up-to-date information and download availability, see: <https://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>SIMATIC Micro Memory Cards</b>		
<b>MMC 64 KB <sup>2)</sup></b>	<b>6ES7953-8LF31-0AA0</b>	
For program backup.		
<b>MMC 128 KB <sup>2)</sup></b>	<b>6ES7953-8LG31-0AA0</b>	
For program backup.		
<b>MMC 512 KB <sup>2)</sup></b>	<b>6ES7953-8LJ31-0AA0</b>	
For program backup.		
<b>MMC 2 MB <sup>2)</sup></b>	<b>6ES7953-8LL31-0AA0</b>	
For program backup and/or firmware updates.		
<b>MMC 4 MB <sup>2)</sup></b>	<b>6ES7953-8LM32-0AA0</b>	
For program backup.		
<b>MMC 8 MB <sup>2)</sup></b>	<b>6ES7953-8LP31-0AA0</b>	
For program backup.		
<b>Connection module</b>	<b>6ES7194-4AN00-0AA0</b>	
For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.		
<b>SCALANCE X-200 Industrial Ethernet switches</b>	<b>6GK5208-0HA10-2AA6</b>	
With integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbps M12 ports, incl. eleven M12 dust caps.		
<b>Industrial Ethernet FC RJ45 plug 90</b>		
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet.		
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>	<b>6GK1901-1BB20-2AA0</b> <b>6GK1901-1BB20-2AB0</b>	
<b>Industrial Ethernet FC RJ45 plug 180</b>		
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet		
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> <li>• 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	
<b>Industrial Ethernet FastConnect installation cables</b>		
<ul style="list-style-type: none"> <li>• FastConnect standard cable</li> <li>• FastConnect trailing cable</li> <li>• FastConnect marine cable</li> </ul>	<b>6XV1840-2AH10</b> <b>6XV1840-3AH10</b> <b>6XV1840-4AH10</b>	
<b>Industrial Ethernet FastConnect installation cables</b>		
<ul style="list-style-type: none"> <li>• IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.</li> </ul>		<b>6XV1870-2D</b>
<ul style="list-style-type: none"> <li>• IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.</li> </ul>		<b>6XV1870-2F</b>
<b>Industrial Ethernet FastConnect</b>		
Stripping tool		<b>6GK1901-1GA00</b>
<b>IE connecting cable M12-180/M12-180</b>		
<ul style="list-style-type: none"> <li>• Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths: <ul style="list-style-type: none"> <li>- 0.3 m</li> <li>- 0.5 m</li> <li>- 1.0 m</li> <li>- 1.5 m</li> <li>- 2.0 m</li> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> <li>- 15 m</li> </ul> </li> <li>• PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths: <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> <li>• PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths: <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> </ul>		<b>6XV1870-8AE30</b> <b>6XV1870-8AE50</b> <b>6XV1870-8AH10</b> <b>6XV1870-8AH15</b> <b>6XV1870-8AH20</b> <b>6XV1870-8AH30</b> <b>6XV1870-8AH50</b> <b>6XV1870-8AN10</b> <b>6XV1870-8AN15</b>
		<b>3RK1902-2NB30</b> <b>3RK1902-2NB50</b> <b>3RK1902-2NC10</b>
		<b>3RK1902-2HB30</b> <b>3RK1902-2HB50</b> <b>3RK1902-2HC10</b>
<b>IE FC M12 plug PRO</b>		
PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.		
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 8 units</li> <li>• PROFINET M12 plug connector, D-coded, angled</li> </ul>		<b>6GK1901-0DB20-6AA0</b> <b>6GK1901-0DB20-6AA8</b> <b>3RK1902-2DA00</b>
<b>IE panel feedthrough</b>		
Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units		<b>6GK1901-0DM20-2AA5</b>

<sup>2)</sup> An MMC is essential for operating the CPU

## Distributed Controllers

based on ET 200Pro

Fail-safe CPUs

### IM 154-8 F PN/DP CPU

#### Ordering data

##### 7/8" connecting cable to power supply

- 5-wire, 5 x 1.5 mm<sup>2</sup>, trailing, pre-assembled with two 7/8" plugs (axial cable outlet), 5-pin, up to 50 m, in various lengths:

- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

- Other special lengths with 90° or 180° cable outlet

- Trailing power cable, 5 x 1.5 mm<sup>2</sup>, pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

- Trailing power cable, 5 x 1.5 mm<sup>2</sup>, pre-assembled at one end with 7/8" angled plug with female contact insert (female contact insert at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

##### Power line

5-wire, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.

##### 7/8" connection plug

For ET 200eco, with axial cable outlet

- With male contact insert, 5-pack
- With female contact insert, 5-pack
- Angled, with female contact insert, 1 unit
- Angled, with male contact insert, 1 unit

7/8" cover cap, 10 per pack

##### Twisted pair cables 4x2 with RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

##### Crossed twisted pair cables 4x2 with RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

#### Article No.

6XV1822-5BH15  
6XV1822-5BH20  
6XV1822-5BH30  
6XV1822-5BH50  
6XV1822-5BN10  
6XV1822-5BN15

See  
<http://support.automation.siemens.com/WWW/view/en/26999294>

3RK1902-3NB30  
3RK1902-3NB50  
3RK1902-3NC10

3RK1902-3GB30  
3RK1902-3GB50  
3RK1902-3GC10

6XV1830-8AH10

6GK1905-0FA00  
6GK1905-0FB00  
3RK1902-3DA00

3RK1902-3BA00

6ES7194-3JA00-0AA0

6XV1870-3QE50

6XV1870-3QH10

6XV1870-3QH20

6XV1870-3QH60

6XV1870-3QN10

6XV1870-3RE50

6XV1870-3RH10

6XV1870-3RH20

6XV1870-3RH60

6XV1870-3RN10

#### Article No.

##### M12 sealing cap

For protection of unused M12 connections with ET 200pro

##### M12 sealing caps with female thread

5 units

##### PROFIBUS M12 connecting cable

Pre-assembled, with two 5-pin M12 plugs/sockets, up to 100 m, in various lengths:

- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

Other special lengths with 90° or 180° cable outlet

##### M12 bus termination connector for PROFIBUS, female contact insert

##### M12 bus termination connector for PROFIBUS, male contact insert

##### M12 plug connector, axial outlet, with male contact insert

##### PROFIBUS FC standard cable GP

Standard type with special design for quick mounting, 2-wire, shielded.

Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.

##### PROFIBUS FC trailing cable

2-wire, shielded.

##### PROFIBUS FC food cable

2-wire, shielded.

Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.

##### PROFIBUS FC robust cable

2-wire, shielded.

Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.

##### PROFIBUS M12 connection plug

5-pin, B-coded, metal housing, 1 pack = 5 units.

- Female contact insert

3RX9802-0AA00

6ES7194-4JD60-0AA0

6XV1830-3DH15

6XV1830-3DH20

6XV1830-3DH30

6XV1830-3DH50

6XV1830-3DN10

6XV1830-3DN15

See  
<http://support.automation.siemens.com/WWW/view/en/26999294>

6GK1905-0ED00

6GK1905-0EC00

6GK1905-0EA00

6XV1830-0EH10

6XV1830-3EH10

6XV1830-0GH10

6XV1830-0JH10

6GK1905-0EB00

**Technical specifications**

Article number	<b>6ES7154-8FB01-0AB0</b> ET 200pro: IM 154-8F PN/DP CPU, 512KB	<b>6ES7154-8FX00-0AB0</b> ET 200pro: IM 154-8FX PN/DP CPU, 1,5MB
<b>General information</b>		
<b>Product function</b>		
• Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
<b>Power loss</b>		
Power loss, typ.	8.5 W	8.5 W
<b>Memory</b>		
<b>Work memory</b>		
• integrated	512 kbyte	1 536 kbyte
• expandable	No	No
<b>Load memory</b>		
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte
<b>CPU processing times</b>		
for bit operations, typ.	0.05 µs	0.025 µs
for word operations, typ.	0.09 µs	0.03 µs
for fixed point arithmetic, typ.	0.12 µs	0.04 µs
for floating point arithmetic, typ.	0.45 µs	0.16 µs
<b>Counters, timers and their retentivity</b>		
<b>S7 counter</b>		
• Number	256	256
<b>IEC counter</b>		
• present	Yes	Yes
<b>S7 times</b>		
• Number	256	256
<b>IEC timer</b>		
• present	Yes	Yes
<b>Data areas and their retentivity</b>		
<b>Flag</b>		
• Size, max.	2 048 byte	2 048 byte
<b>Address area</b>		
<b>I/O address area</b>		
• Inputs	2 048 byte	2 048 byte
• Outputs	2 048 byte	2 048 byte
<b>Process image</b>		
• Inputs, adjustable	2 048 byte	2 048 byte
• Outputs, adjustable	2 048 byte	2 048 byte
<b>Time of day</b>		
<b>Clock</b>		
• Hardware clock (real-time)	Yes	Yes
<b>Operating hours counter</b>		
• Number	1	1
<b>1. Interface</b>		
Interface type	Integrated RS 485 interface	Integrated RS 485 interface
<b>Interface types</b>		
• RS 485	Yes	Yes
<b>Protocols</b>		
• MPI	Yes	Yes
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	Yes	Yes
• Point-to-point connection	No	No
<b>PROFIBUS DP master</b>		
• Number of DP slaves, max.	124	124
<b>2. Interface</b>		
<b>Interface types</b>		
• Number of ports	3	3

## Distributed Controllers

based on ET 200Pro

Fail-safe CPUs

### IM 154-8 F PN/DP CPU

#### Technical specifications

Article number	<b>6ES7154-8FB01-0AB0</b>	<b>6ES7154-8FX00-0AB0</b>
	ET 200pro: IM 154-8F PN/DP CPU, 512KB	ET 200pro: IM 154-8FX PN/DP CPU, 1,5MB
<b>Protocols</b>		
• MPI	No	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes	Yes
• PROFIBUS DP master	No	No
• PROFIBUS DP slave	No	No
<b>PROFINET IO Controller</b>		
<b>Services</b>		
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- Number of IO Devices with IRT and the option "high flexibility"	128	128
- Number of connectable IO Devices for RT, max.	128	128
<b>Protocols</b>		
<b>SIMATIC communication</b>		
• S7 routing	Yes	Yes
<b>Open IE communication</b>		
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	8
• ISO-on-TCP (RFC1006)	Yes	Yes
- Number of connections, max.	8	8
• UDP	Yes	Yes
- Number of connections, max.	8	8
<b>Web server</b>		
• supported	Yes	Yes
<b>Communication functions</b>		
PG/OP communication	Yes	Yes
<b>Global data communication</b>		
• supported	Yes	Yes
<b>S7 basic communication</b>		
• supported	Yes	Yes
<b>S7 communication</b>		
• supported	Yes	Yes
<b>Number of connections</b>		
• overall	16	16
<b>Configuration</b>		
<b>Programming</b>		
<b>Programming language</b>		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	Yes	Yes
- GRAPH	Yes	Yes
- HiGraph®	Yes	Yes
<b>Know-how protection</b>		
• User program protection/ password protection	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>		
Width	135 mm	135 mm
Height	130 mm	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
<b>Weights</b>		
Weight, approx.	720 g	720 g

7



## Overview



- Fail-safe CPU 1513pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements on the program scope and processing speed, for distributed setup via PROFINET IO.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFIsafe in centralized and distributed configurations
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA Server and Client (data access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

### Note

SIMATIC Memory Card required for operation of the CPU.

## Ordering data

## Article No.

### CPU 1513pro F-2 PN

6ES7513-2GL00-0AB0

450 KB work memory for program, 1.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required

### Accessories

#### SIMATIC Memory Card

- 4 MB<sup>1)</sup>
- 12 MB<sup>1)</sup>
- 24 MB<sup>1)</sup>
- 256 MB<sup>1)</sup>
- 2 GB<sup>1)</sup>
- 32 GB<sup>1)</sup>

6ES7954-8LC03-0AA0  
6ES7954-8LE03-0AA0  
6ES7954-8LF03-0AA0  
6ES7954-8LL03-0AA0  
6ES7954-8LP03-0AA0  
6ES7954-8LT03-0AA0

#### Connection module

6ES7194-4AP00-0AA0

CM CPU 2PN M12 / 7/8";  
With 3 x M12 and 2 x 7/8",  
for connecting 2 x PROFINET

#### Industrial Ethernet FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

#### Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10  
6XV1840-3AH10  
6XV1840-4AH10

#### Industrial Ethernet FastConnect installation cables

- IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.
- IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.

6XV1870-2D  
6XV1870-2F

#### Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

<sup>1)</sup> An MMC is essential for operating the CPU

## Distributed Controllers

based on ET 200Pro

Fail-safe CPUs

### CPU 1513pro F-2 PN

#### Ordering data

#### Article No.

#### Article No.

##### IE connecting cable M12-180/M12-180

Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1870-8AE30  
6XV1870-8AE50  
6XV1870-8AH10  
6XV1870-8AH15  
6XV1870-8AH20  
6XV1870-8AH30  
6XV1870-8AH50  
6XV1870-8AN10  
6XV1870-8AN15

PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

3RK1902-2NB30  
3RK1902-2NB50  
3RK1902-2NC10

PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

3RK1902-2HB30  
3RK1902-2HB50  
3RK1902-2HC10

##### IE FC M12 plug PRO

PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.

- 1 unit
- 8 units
- PROFINET M12 plug connector, D-coded, angled.

6GK1901-0DB20-6AA0  
6GK1901-0DB20-6AA8  
3RK1902-2DA00

##### IE panel feedthrough

Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.

6GK1901-0DM20-2AA5

##### 7/8" connecting cable to power supply

5-wire, 5 x 1.5 mm<sup>2</sup>, trailing, pre-assembled with two 7/8" plugs (axial cable outlet), 5-pin, up to 50 m, in various lengths:

- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m
- Other special lengths with 90° or 180° cable outlet.

6XV1822-5BH15  
6XV1822-5BH20  
6XV1822-5BH30  
6XV1822-5BH50  
6XV1822-5BN10  
6XV1822-5BN15  
See  
<http://support.automation.siemens.com/WW/view/en/26999294>

Trailing power cable, 5 x 1.5 mm<sup>2</sup>, pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

3RK1902-3NB30  
3RK1902-3NB50  
3RK1902-3NC10

Trailing power cable, 5 x 1.5 mm<sup>2</sup>, pre-assembled at one end with 7/8" angled plug with female contact insert (female contact insert at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

3RK1902-3GB30  
3RK1902-3GB50  
3RK1902-3GC10

##### Power line

5-wire, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.

6XV1830-8AH10

##### 7/8" connection plug

For ET 200eco, with axial cable outlet

- With male contact insert, 5-pack
- With female contact insert, 5-pack
- Angled, with female contact insert, 1 unit
- Angled, with male contact insert, 1 unit

6GK1905-0FA00  
6GK1905-0FB00  
3RK1902-3DA00  
3RK1902-3BA00

7/8" cover cap, 10 per pack

6ES7194-3JA00-0AA0

##### Twisted pair cables 4x2 with RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

6XV1870-3QE50  
6XV1870-3QH10  
6XV1870-3QH20  
6XV1870-3QH60  
6XV1870-3QN10

##### Crossed twisted pair cables 4x2 with RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

6XV1870-3RE50  
6XV1870-3RH10  
6XV1870-3RH20  
6XV1870-3RH60  
6XV1870-3RN10

##### M12 sealing cap

For protection of unused M12 connections with ET 200pro

3RX9802-0AA00

##### M12 sealing caps with female thread

5 units

6ES7194-4JD60-0AA0

## Technical specifications

Article number	<b>6ES7513-2GL00-0AB0</b> ET 200pro: CPU 1513pro F-2 PN
<b>General information</b>	
Product type designation	CPU 1513pro F-2 PN
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V16 (FW V2.8) or higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	450 kbyte
• integrated (for data)	1.5 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	40 ns
for word operations, typ.	48 ns
for fixed point arithmetic, typ.	64 ns
for floating point arithmetic, typ.	256 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

Article number	<b>6ES7513-2GL00-0AB0</b> ET 200pro: CPU 1513pro F-2 PN
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
<b>2. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No

## Distributed Controllers

based on ET 200Pro

Fail-safe CPUs

### CPU 1513pro F-2 PN

#### Technical specifications

Article number	<b>6ES7513-2GL00-0AB0</b> ET 200pro: CPU 1513pro F-2 PN
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFinergy	Yes
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	128; Via integrated interfaces of the CPU
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool

Article number	<b>6ES7513-2GL00-0AB0</b> ET 200pro: CPU 1513pro F-2 PN
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	135 mm
Height	130 mm
Depth	65 mm
<b>Weights</b>	
Weight, approx.	614 g

**Overview**

- Fail-safe CPU 1516pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516F-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- PROFINET IO controller for operating distributed I/O on PROFINET

- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA Server and Client (Data Access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

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**Ordering data****Article No.****Article No.****CPU 1516pro F-2 PN**

1.5 MB work memory for program,  
5 MB for data,  
PROFINET IO IRT interface,  
PROFINET IO RT interface;  
SIMATIC Memory Card required

**6ES7516-2GN00-0AB0****Accessories****SIMATIC Memory Card**

- 4 MB<sup>1)</sup>
- 12 MB<sup>1)</sup>
- 24 MB<sup>1)</sup>
- 256 MB<sup>1)</sup>
- 2 GB<sup>1)</sup>
- 32 GB<sup>1)</sup>

**6ES7954-8LC03-0AA0****6ES7954-8LE03-0AA0****6ES7954-8LF03-0AA0****6ES7954-8LL03-0AA0****6ES7954-8LP03-0AA0****6ES7954-8LT03-0AA0****Terminal module**

CM CPU 2PN M12 / 7/8";  
With 3 x M12 and 2 x 7/8";  
for connecting 2 x PROFINET

**6ES7194-4AP00-0AA0****Industrial Ethernet FC RJ45 plug 180**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

**6GK1901-1BB10-2AA0****6GK1901-1BB10-2AB0****6GK1901-1BB10-2AE0****Industrial Ethernet FastConnect installation cables**

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

**6XV1840-2AH10****6XV1840-3AH10****6XV1840-4AH10****Industrial Ethernet FastConnect installation cables**

- IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.
- IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.

**6XV1870-2D****6XV1870-2F****Industrial Ethernet FastConnect**

Stripping tool

**6GK1901-1GA00****IE connecting cable M12-180/M12-180**

Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

**6XV1870-8AE30****6XV1870-8AE50****6XV1870-8AH10****6XV1870-8AH15****6XV1870-8AH20****6XV1870-8AH30****6XV1870-8AH50****6XV1870-8AN10****6XV1870-8AN15**

PROFINET M12 trailing connecting cable, preassembled at both ends with angled M12 plugs (male insert), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

**3RK1902-2NB30****3RK1902-2NB50****3RK1902-2NC10**

<sup>1)</sup> An MMC is essential for operating the CPU

## Distributed Controllers

based on ET 200Pro

Fail-safe CPUs

### CPU 1516pro F-2 PN

#### Ordering data

PROFINET M12 trailing connecting cable, preassembled at one end with angled M12 plug (male insert at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

#### Article No.

**3RK1902-2HB30**  
**3RK1902-2HB50**  
**3RK1902-2HC10**

#### IE FC M12 plug PRO

PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.

- 1 unit
- 8 units
- PROFINET M12 plug connector, D-coded, angled.

**6GK1901-0DB20-6AA0**  
**6GK1901-0DB20-6AA8**  
**3RK1902-2DA00**

#### IE panel feedthrough

Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.

**6GK1901-0DM20-2AA5**

#### 7/8" connecting cable to power supply

5-wire, 5 x 1.5 mm<sup>2</sup>, trailing, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:

- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m
- Other special lengths with 90° or 180° cable outlet.

**6XV1822-5BH15**  
**6XV1822-5BH20**  
**6XV1822-5BH30**  
**6XV1822-5BH50**  
**6XV1822-5BN10**  
**6XV1822-5BN15**  
 See  
<http://support.automation.siemens.com/WWW/view/en/26999294>

Trailing power cable, 5 x 1.5 mm<sup>2</sup>, preassembled at both ends with 7/8" angled connectors (female contact insert at one end, male insert at the other end), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

**3RK1902-3NB30**  
**3RK1902-3NB50**  
**3RK1902-3NC10**

Trailing power cable, 5 x 1.5 mm<sup>2</sup>, preassembled at one end with 7/8" angled connector with female contact insert (female contact insert at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

#### Article No.

**3RK1902-3GB30**  
**3RK1902-3GB50**  
**3RK1902-3GC10**

#### Power line

5-wire, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.

**6XV1830-8AH10**

#### 7/8" connection plug

For ET 200eco, with axial cable outlet

- with male insert, 5-pack
- with female contact insert, 5-pack
- Angled, with female contact insert, 1 unit
- Angled, with male insert, 1 unit

**6GK1905-0FA00**  
**6GK1905-0FB00**  
**3RK1902-3DA00**

7/8" cover cap, 10 per pack

**3RK1902-3BA00**  
**6ES7194-3JA00-0AA0**

#### Twisted pair cables 4x2 with RJ45 connectors

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

**6XV1870-3QE50**  
**6XV1870-3QH10**  
**6XV1870-3QH20**  
**6XV1870-3QH60**  
**6XV1870-3QN10**

#### Crossed twisted pair cables 4x2 with RJ45 connectors

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

**6XV1870-3RE50**  
**6XV1870-3RH10**  
**6XV1870-3RH20**  
**6XV1870-3RH60**  
**6XV1870-3RN10**

#### M12 sealing cap

For protection of unused M12 connections with ET 200pro

**3RX9802-0AA00**

#### M12 sealing caps with female thread

5 units

**6ES7194-4JD60-0AA0**

#### Technical specifications

Article number	<b>6ES7516-2GN00-0AB0</b> ET 200pro: CPU 1516PRO F-2 PN
<b>General information</b>	
Product type designation	CPU 1516pro F-2 PN
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	V17 (FW V2.9) / V14 (FW V2.0) or higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	5 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte

Article number	<b>6ES7516-2GN00-0AB0</b> ET 200pro: CPU 1516PRO F-2 PN
<b>CPU processing times</b>	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048

**Technical specifications**

Article number	<b>6ES7516-2GN00-0AB0</b> ET 200pro: CPU 1516PRO F-2 PN
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFlenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

Article number	<b>6ES7516-2GN00-0AB0</b> ET 200pro: CPU 1516PRO F-2 PN
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFlenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
<b>2. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFlenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

## Distributed Controllers

based on ET 200Pro

Fail-safe CPUs

### CPU 1516pro F-2 PN

#### Technical specifications

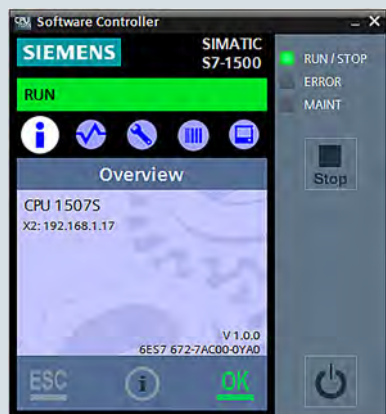
Article number	<b>6ES7516-2GN00-0AB0</b> ET 200pro: CPU 1516PRO F-2 PN
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFlenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	128; Via integrated interfaces of the CPU
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	<b>6ES7516-2GN00-0AB0</b> ET 200pro: CPU 1516PRO F-2 PN
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	135 mm
Height	130 mm
Depth	65 mm
<b>Weights</b>	
Weight, approx.	614 g

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## Software Controllers

**8/2 SIMATIC S7-1500 Software Controllers**8/2 [Standard CPUs](#)

8/2 CPU 1507S

8/6 CPU 1508S

8/10 [Fail-safe CPUs](#)

8/10 CPU 1507S F

8/14 CPU 1508S F

8/18 [Add-on applications](#)

8/18 ODK 1500S SQL driver

8/18 ODK 1500S XML Data Access driver

8/19 ODK 1500S FileServer

8/19 ODK 1500S SMX driver

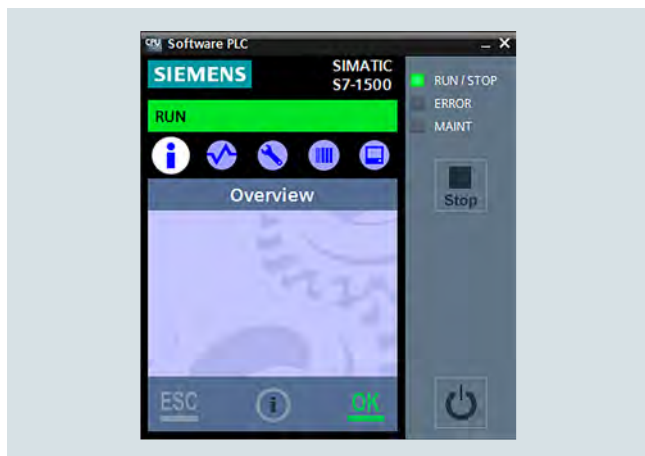
8/19 ODK 1500S serial driver

## Software Controllers

### SIMATIC S7-1500 Software Controllers Standard CPUs

#### CPU 1507S

#### Overview



- Software Controller for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use as a PC-based PLC in machines with distributed I/O via PROFINET and PROFIBUS
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET and PROFIBUS connections
- Optimized for PC-based control tasks with the IPC427E Microbox PC and the IPC477E Panel PC
- Can also be used on the IPC227E, IPC627D, IPC627E and IPC827D Box PCs, the IPC277E, IPC677D and IPC677E Panel PCs, and the IPC647D, IPC647E, IPC847D and IPC847E Rack PCs
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1507S (C/C++)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA server (data access) and client as runtime option for easy connection of the software controller to Windows applications or non-Siemens devices/systems

#### Ordering data

#### Article No.

##### SIMATIC S7-1500 Software Controller CPU 1507S

For implementing the function of an S7-1500 Controller on SIMATIC IPCs

##### Target system:

Optimized for PC-based control tasks with IPC427E Microbox PC and IPC477E Panel PC;

Can also be used with IPC277E Panel PC, IPC677D Panel PC, IPC677E Panel PC, IPC227E Box PC, IPC627D Box PC, IPC627E Box PC, IPC827D Box PC, IPC647D Rack PC, IPC647E Rack PC, IPC847D Rack PC, IPC847E Rack PC

##### Requirement:

Windows 7 / Windows Embedded Standard 7 / Windows 10 Enterprise; for supported Windows 10 version, see technical specifications

##### Type of delivery:

English, German, Chinese, Italian, French, Spanish

- Single license for one installation Software and documentation on DVD, license key on USB flash drive
- Single license for one installation; Software download including license key <sup>1)</sup>

6ES7672-7AC01-0YA0

6ES7672-7AC01-0YG0

#### Article No.

##### Accessories

##### SIMATIC IPC

- SIMATIC IPC427E Microbox PC
- SIMATIC IPC477E Panel PC
- SIMATIC IPC227E Nanobox PC
- SIMATIC IPC277E Panel PC
- SIMATIC IPC677D Panel PC
- SIMATIC IPC677E Panel PC
- SIMATIC IPC627D Box PC
- SIMATIC IPC627E Box PC
- SIMATIC IPC827D Box PC
- SIMATIC IPC647D Rack PC
- SIMATIC IPC647E Rack PC
- SIMATIC IPC847D Rack PC
- SIMATIC IPC847E Rack PC

6AG4141-.....-.....  
6AV7241-.....-.....  
6ES7647-8B.....-.....  
6AV7882-0...0-...0  
6AV7260-.....-.....  
6AV7261-.....-.....  
6AG4131-2.....-.....  
6AG4131-3.....-.....  
6AG4132-2.....-.....  
6AG4112-2.....-.....  
6AG4112-3.....-.....  
6AG4114-2.....-.....  
6AG4114-3.....-.....

##### CP 1625

##### communications processor

PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller

6ES7648-2CF10-1AA0

##### CP 5622

##### communications processor

PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS

6GK1562-2AA00

##### CP 5623

##### communications processor

PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A; for operating system support see SIMATIC NET software en/de

6GK1562-3AA00

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	<b>6ES7672-7AC01-0YA0</b> SIMATIC Software Controller CPU 1507S
<b>General information</b>	
Product type designation	CPU 1507S
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 287
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	5 Mbyte
• integrated (for data)	20 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
<b>Load memory</b>	
• integrated (on PC mass storage)	320 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte
• Outputs	32 kbyte
<b>Time of day</b>	
<b>Clock</b>	
• Type	Software clock, synchronizable, no battery backup
<b>Interfaces</b>	
Number of interfaces	3
<b>1. Interface</b>	
Interface type	CP 1625
Number of connections	128
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes

Article number	<b>6ES7672-7AC01-0YA0</b> SIMATIC Software Controller CPU 1507S
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes

## Software Controllers

### SIMATIC S7-1500 Software Controllers Standard CPUs

#### CPU 1507S

#### Technical specifications

Article number	<b>6ES7672-7AC01-0YA0</b> SIMATIC Software Controller CPU 1507S
<b>2. Interface</b>	
Interface type	Onboard PROFINET / IE interface X2/X3 of the SIMATIC IPC, Intel Springville i210T
Number of connections via this interface	128
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	1
• integrated switch	No
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes

Article number	<b>6ES7672-7AC01-0YA0</b> SIMATIC Software Controller CPU 1507S
<b>3. Interface</b>	
Interface type	PROFIBUS with CP 5622, CP 5622 onboard
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	64
<b>Services</b>	
- Equidistance	No
- Isochronous mode	No
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>4. Interface</b>	
Interface type	PROFIBUS with CP 5623
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	128
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space

### Technical specifications

Article number	<b>6ES7672-7AC01-0YA0</b> SIMATIC Software Controller CPU 1507S
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Hardware requirement</b>	
Hardware required	SIMATIC IPC2x7E, IPC4x7D/E, IPC6x7D/E, IPC8x7D/E
<b>Processor</b>	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
<b>Memory</b>	
• Work memory, min.	4 Gbyte
• Hard disk memory required for installation	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte
• Hard disk memory required at runtime	400 Mbyte

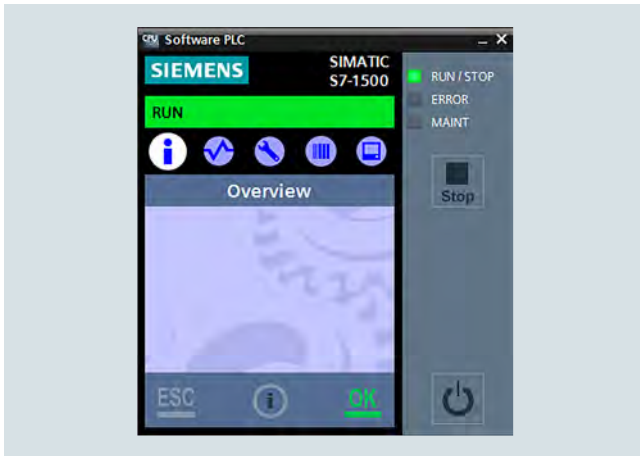
Article number	<b>6ES7672-7AC01-0YA0</b> SIMATIC Software Controller CPU 1507S
<b>Operating systems</b>	
<b>Runs under operating system</b>	
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit); Windows Embedded Standard 7 with delivery image of the SIMATIC IPC
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D, IPC8x7D; Windows 10 Enterprise 2019 LTSC 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7E, IPC8x7E
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	9.8 Mbyte

## Software Controllers

### SIMATIC S7-1500 Software Controllers Standard CPUs

#### CPU 1508S

#### Overview



- Software Controller for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use with control applications with increased requirements for program and data memory
- For use as a PC-based PLC in machines with distributed I/O via PROFINET and PROFIBUS
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET and PROFIBUS connections
- Optimized for PC-based control tasks with the IPC627E Box PC, the IPC677E Panel PC, and the IPC647E and IPC847E Rack PCs
- Can also be used on the IPC427E, IPC627D and IPC827D Box PCs, the IPC477E and IPC677D Panel PCs, and the IPC647D and IPC847D Rack PCs
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1508S (C/C++)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- OPC UA server (data access) and client as runtime option for easy connection of the software controller to Windows applications or non-Siemens devices/systems

#### Ordering data

#### Article No.

##### SIMATIC S7-1500 Software Controller CPU 1508S

For implementing the function of an S7-1500 Controller on SIMATIC IPCs

##### Target system:

Optimized for PC-based control tasks with

Panel PC IPC677E,  
Box PC IPC627E,  
Rack PC IPC647E,  
Rack PC IPC847E;  
can also be used with  
Panel PC IPC477E,  
Panel PC IPC677D,  
Box PC IPC427E,  
Box PC IPC627D,  
Box PC IPC827D,  
Rack PC IPC647D,  
Rack PC IPC847D;

##### Requirement:

Windows 7 /  
Windows Embedded Standard 7 /  
Windows 10 (64-bit)

##### Type of delivery:

en, de, fr, it, es, zh

- Single license for one installation  
Software and documentation on  
DVD, license key on USB flash  
drive
- Single license for one installation;  
Software download including  
license key <sup>1)</sup>

6ES7672-8AC01-0YA0

6ES7672-8AC01-0YG0

#### Article No.

##### Accessories

##### SIMATIC IPC

- SIMATIC IPC427E Microbox PC
- SIMATIC IPC477E Panel PC
- SIMATIC IPC677D Panel PC
- SIMATIC IPC677E Panel PC
- SIMATIC IPC627D Box PC
- SIMATIC IPC627E Box PC
- SIMATIC IPC827D Box PC
- SIMATIC IPC647D Rack PC
- SIMATIC IPC647E Rack PC
- SIMATIC IPC847D Rack PC
- SIMATIC IPC847E Rack PC

6AG4141-.....  
6AV7241-.....  
6AV7260-.....  
6AV7261-.....  
6AG4131-2.....  
6AG4131-3.....  
6AG4132-2.....  
6AG4112-2.....  
6AG4112-3.....  
6AG4114-2.....  
6AG4114-3.....

For more information,  
see Catalog ST 80 / ST PC.

##### CP 1625 communications processor

PCI Express x1 card for  
connecting PROFINET with IRT  
to the SIMATIC S7-1500  
Software Controller

6ES7648-2CF10-1AA0

##### CP 5622 communications processor

PCI Express x1 card (32-bit) for  
connecting a programming device  
or PC to PROFIBUS

6GK1562-2AA00

##### CP 5623 communications processor

PCI Express x1 card (32-bit)  
for connection to PROFIBUS incl.  
DP-Base software with NCM PC;  
DP-RAM interface for DP master  
or DP slave, incl. PG and  
FDL protocols; single license  
for 1 installation, runtime software,  
software and electronic manual on  
CD-ROM, Class A;  
for operating system support  
see SIMATIC NET software  
en/de

6GK1562-3AA00

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	<b>6ES7672-8AC01-0YA0</b> SIMATIC Software Controller CPU 1508S
<b>General information</b>	
Product type designation	CPU 1508S
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 287
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	10 Mbyte
• integrated (for data)	100 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
<b>Load memory</b>	
• integrated (on PC mass storage)	1 024 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte
• Outputs	32 kbyte
<b>Time of day</b>	
<b>Clock</b>	
• Type	Software clock, synchronizable, no battery backup
<b>Interfaces</b>	
Number of interfaces	3
<b>1. Interface</b>	
Interface type	CP 1625
Number of connections	192
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• integrated switch	Yes
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes

Article number	<b>6ES7672-8AC01-0YA0</b> SIMATIC Software Controller CPU 1508S
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
<b>2. Interface</b>	
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Number of connections via this interface	192
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	1
• integrated switch	No

## Software Controllers

### SIMATIC S7-1500 Software Controllers Standard CPUs

#### CPU 1508S

#### Technical specifications

Article number	<b>6ES7672-8AC01-0YA0</b> SIMATIC Software Controller CPU 1508S
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	No
- PROFINergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	No
- PROFINergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
<b>3. Interface</b>	
Interface type	PROFIBUS with CP 5622, CP 5622 onboard
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible

Article number	<b>6ES7672-8AC01-0YA0</b> SIMATIC Software Controller CPU 1508S
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	64
<b>Services</b>	
- Equidistance	No
- Isochronous mode	No
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>4. Interface</b>	
Interface type	PROFIBUS with CP 5623
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	192
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space



### Technical specifications

Article number	<b>6ES7672-8AC01-0YA0</b> SIMATIC Software Controller CPU 1508S
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Hardware requirement</b>	
Hardware required	SIMATIC IPC4x7E, IPC6x7D/E, IPC8x7D/E
<b>Processor</b>	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
<b>Memory</b>	
• Work memory, min.	8 Gbyte
• Hard disk memory required for installation	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte
• Hard disk memory required at runtime	1 000 Mbyte

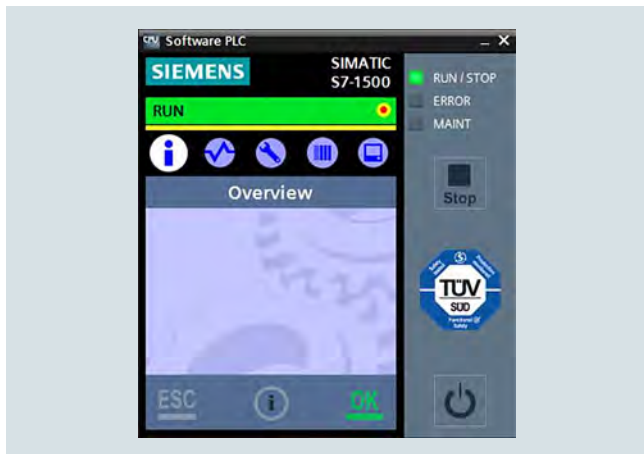
Article number	<b>6ES7672-8AC01-0YA0</b> SIMATIC Software Controller CPU 1508S
<b>Operating systems</b>	
<b>Runs under operating system</b>	
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit); Windows Embedded Standard 7 with delivery image of the SIMATIC IPC
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D, IPC8x7D; Windows 10 Enterprise 2019 LTSC 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7E, IPC8x7E
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	9.8 Mbyte

## Software Controllers

### SIMATIC S7-1500 Software Controllers Fail-safe CPUs

#### CPU 1507S F

#### Overview



- Software Controller for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use as a PC-based PLC in machines with distributed I/O via PROFINET and PROFIBUS
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET and PROFIBUS connections
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849

- Supports PROFIsafe in distributed configurations
- Optimized for PC-based control tasks with the IPC427E Microbox PC and the IPC477E Panel PC (requires configuration with NVRAM)
- Can also be used on IPC227E, IPC627D, IPC627E and IPC827D Box PCs, IPC277E, IPC677D and IPC677E Panel PCs, and IPC647E and IPC847E Rack PCs (configurations with NVRAM are required for the IPC227E, IPC427E, IPC627D, IPC827D, IPC277E, IPC477E and IPC677D PCs)
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1507S F (C/C++)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA server (data access) and client as runtime option for easy connection of the software controller to Windows applications or non-Siemens devices/systems

#### Ordering data

#### Article No.

##### SIMATIC S7-1500 Software Controller CPU 1507S F

For implementing the function of a fail-safe S7-1500 Controller on SIMATIC IPCs

##### Target system:

Optimized for PC-based control tasks with IPC427E Microbox PC and IPC477E Panel PC;

Can also be used with IPC277E Panel PC, IPC677D Panel PC, IPC677E Panel PC, IPC227E Box PC, IPC627D Box PC, IPC627E Box PC, IPC827D Box PC, IPC647E Rack PC, IPC847E Rack PC

##### Requirement:

Windows 7 / Windows Embedded Standard 7 / Windows 10 Enterprise LTSC with MBR boot;

For supported Windows 10 versions, see Technical specifications

For the IPC227E, IPC427E, IPC627D, IPC827D, IPC277E, IPC477E and IPC677D, IPC configurations with NVRAM are required)

##### Type of delivery:

English, German, Chinese, Italian, French, Spanish

- Single license for one installation. Software and documentation on DVD, license key on USB flash drive
- Single license for one installation; Software download including license key <sup>1)</sup>

6ES7672-7FC01-0YA0

6ES7672-7FC01-0YG0

#### Article No.

##### Accessories

##### SIMATIC IPC

- SIMATIC IPC227E Nanobox PC
- SIMATIC IPC427E Microbox PC
- SIMATIC IPC627D Box PC
- SIMATIC IPC627E Box PC
- SIMATIC IPC827D Box PC
- SIMATIC IPC277E Panel PC
- SIMATIC IPC477E Panel PC
- SIMATIC IPC677D Panel PC
- SIMATIC IPC677E Panel PC
- IPC647E Rack PC
- IPC847E Rack PC

6ES7647-8B...-....

6AG4141-.....-....

6AG4131-2.....-....

6AG4131-3.....-....

6AG4132-2.....-....

6AV7882-0...0-...0

6AV7241-.....-....

6AV7260-.....-....

6AV7261-.....-....

6AG4112-3.....-....

6AG4114-3.....-....

##### CP 1625

##### communications processor

PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller

6ES7648-2CF10-1AA0

##### CP 5622

##### communications processor

PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS

6GK1562-2AA00

##### CP 5623

##### communications processor

PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A; for operating system support see SIMATIC NET software en/de

6GK1562-3AA00

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	<b>6ES7672-7FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1507S F
<b>General information</b>	
Product type designation	CPU 1507S F
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 287
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	7.5 Mbyte
• integrated (for data)	20 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
<b>Load memory</b>	
• integrated (on PC mass storage)	320 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte
• Outputs	32 kbyte
<b>Time of day</b>	
<b>Clock</b>	
• Type	Software clock, synchronizable, no battery backup
<b>Interfaces</b>	
Number of interfaces	3
<b>1. Interface</b>	
Interface type	CP 1625
Number of connections	128
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes

Article number	<b>6ES7672-7FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1507S F
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- PROFINergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes
- Prioritized startup	Yes; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes

## Software Controllers

### SIMATIC S7-1500 Software Controllers Fail-safe CPUs

#### CPU 1507S F

#### Technical specifications

Article number	<b>6ES7672-7FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1507S F
<b>2. Interface</b>	
Interface type	Onboard PROFINET / IE interface X2/X3 of the SIMATIC IPC, Intel Springville i210T
Number of connections via this interface	128
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	1
• integrated switch	No
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes

Article number	<b>6ES7672-7FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1507S F
<b>3. Interface</b>	
Interface type	PROFIBUS with CP 5622, CP 5622 onboard
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	64
<b>Services</b>	
- Equidistance	No
- Isochronous mode	No
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>4. Interface</b>	
Interface type	PROFIBUS with CP 5623
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	128
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space

### Technical specifications

Article number	<b>6ES7672-7FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1507S F
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
<b>Hardware requirement</b>	
Hardware required	SIMATIC IPC2x7E, IPC4x7D/E, IPC627D, IPC677D, IPC827D: configurations with NVRAM required; IPC6x7E, IPC8x7E
<b>Processor</b>	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S

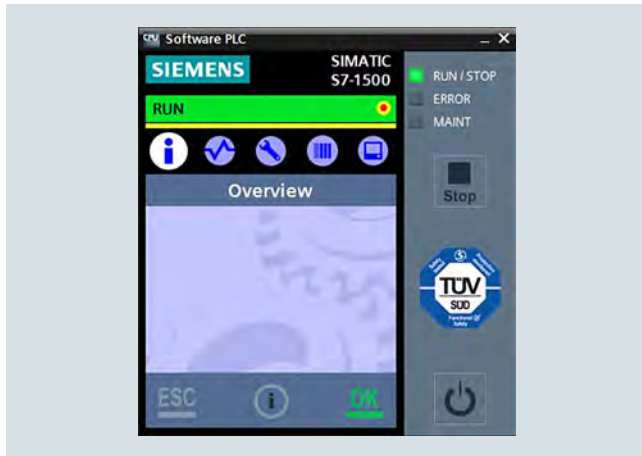
Article number	<b>6ES7672-7FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1507S F
<b>Memory</b>	
• Work memory, min.	4 Gbyte
• Hard disk memory required for installation	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte
• Hard disk memory required at runtime	400 Mbyte
<b>Operating systems</b>	
<b>Runs under operating system</b>	
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit); Windows Embedded Standard 7 with delivery image of the SIMATIC IPC
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D, IPC8x7D; Windows 10 Enterprise 2019 LTSC 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7E, IPC8x7E
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	9.8 Mbyte

## Software Controllers

### SIMATIC S7-1500 Software Controllers Fail-safe CPUs

#### CPU 1508S F

#### Overview



- Software Controller for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use with control applications with increased requirements for program and data memory
- For use as a PC-based PLC in machines with distributed I/O via PROFINET and PROFIBUS
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET and PROFIBUS connections

- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Supports PROFIsafe in distributed configurations
- Optimized for PC-based control tasks with the IPC627E Box PC, the IPC677E Panel PC, and the IPC647E and IPC847E Rack PCs
- Can also be used on the IPC427E, IPC627D and IPC827D Box PCs and the IPC477E and IPC677D Panel PCs (configuration with NVRAM required)
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1508S F (C/C++)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA server (data access) and client as runtime option for easy connection of the software controller to Windows applications or non-Siemens devices/systems

#### Ordering data

#### Article No.

#### Article No.

##### SIMATIC S7-1500 Software Controller CPU 1508S F

For implementing the function of a fail-safe S7-1500 Controller on SIMATIC IPCs (IPC configuration with NVRAM required)

##### Target system:

Optimized for PC-based control tasks with  
IPC677E Panel PC,  
IPC627E Box PC,  
IPC647E Rack PC,  
IPC847E Rack PC;  
Can also be used with  
IPC477E Panel PC,  
IPC677D Panel PC,  
IPC427E Box PC,  
IPC627D Box PC,  
IPC827D Box PC;

##### Requirement:

Windows 7 /  
Windows Embedded Standard 7 /  
Windows 10 (64-bit);  
for supported Windows 10 versions,  
see technical specifications.

On IPC477E, IPC677D, IPC427E,  
IPC627D and IPC827D,  
configurations with NVRAM are  
required

##### Type of delivery:

English, German, Chinese, Italian,  
French, Spanish

- Single license for one installation  
Software and documentation on  
DVD, license key on USB flash  
drive
- Single license for one installation;  
Software download including  
license key <sup>1)</sup>

6ES7672-8FC01-0YA0

6ES7672-8FC01-0YG0

#### Accessories

##### SIMATIC IPC

- SIMATIC IPC427E Microbox PC
- SIMATIC IPC627E Box PC
- SIMATIC IPC627D Box PC
- SIMATIC IPC827D Box PC
- SIMATIC IPC477E Panel PC
- SIMATIC IPC677D Panel PC
- SIMATIC IPC677E Panel PC
- SIMATIC IPC647E Rack PC
- SIMATIC IPC847E Rack PC

For more information,  
see Catalog ST 80 / ST PC.

6AG4141-.....-.....  
6AG4131-3.....-.....  
6AG4131-2.....-.....  
6AG4132-2.....-.....  
6AV7241-.....-.....  
6AV7260-.....-.....  
6AV7261-.....-.....  
6AG4112-3.....-.....  
6AG4114-3.....-.....

##### CP 1625 communications processor

PCI Express x1 card for  
connecting PROFINET with IRT  
to the SIMATIC S7-1500  
Software Controller

6ES7648-2CF10-1AA0

##### CP 5622 communications processor

PCI Express x1 card (32-bit) for  
connecting a programming device  
or PC to PROFIBUS

6GK1562-2AA00

##### CP 5623 communications processor

PCI Express x1 card (32-bit)  
for connection to PROFIBUS incl.  
DP-Base software with NCM PC;  
DP-RAM interface for DP master  
or DP slave, incl. PG and  
FDL protocols; single license  
for 1 installation, runtime software,  
software and electronic manual on  
CD-ROM, Class A;  
for operating system support  
see SIMATIC NET software  
en/de

6GK1562-3AA00

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

### Technical specifications

Article number	<b>6ES7672-8FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1508S F
<b>General information</b>	
Product type designation	CPU 1508S F
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 287
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	12.5 Mbyte
• integrated (for data)	100 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
<b>Load memory</b>	
• integrated (on PC mass storage)	1 024 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Size, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte
• Outputs	32 kbyte
<b>Time of day</b>	
<b>Clock</b>	
• Type	Software clock, synchronizable, no battery backup
<b>Interfaces</b>	
Number of interfaces	3
<b>1. Interface</b>	
Interface type	CP 1625
Number of connections	192
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes

Article number	<b>6ES7672-8FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1508S F
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes

## Software Controllers

### SIMATIC S7-1500 Software Controllers Fail-safe CPUs

#### CPU 1508S F

#### Technical specifications

Article number	<b>6ES7672-8FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1508S F
<b>2. Interface</b>	
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Number of connections via this interface	192
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
• Number of ports	1
• integrated switch	No
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	No
- PROFlenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Isochronous mode	No
- IRT	No
- PROFlenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes

Article number	<b>6ES7672-8FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1508S F
<b>3. Interface</b>	
Interface type	PROFIBUS with CP 5622, CP 5622 onboard
Number of connections via this interface	44
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	64
<b>Services</b>	
- Equidistance	No
- Isochronous mode	No
<b>Address area</b>	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
<b>4. Interface</b>	
Interface type	PROFIBUS with CP 5623
Number of connections via this interface	44
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	192
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 routing	Yes
<b>OPC UA</b>	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space



### Technical specifications

Article number	<b>6ES7672-8FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1508S F
<b>Supported technology objects</b>	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
<b>Hardware requirement</b>	
Hardware required	SIMATIC IPC4x7E, IPC627D, IPC677D, IPC827D, configurations with NVRAM required; IPC6x7E, IPC847E
<b>Processor</b>	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S

Article number	<b>6ES7672-8FC01-0YA0</b> SIMATIC Failsafe SW Ctrl CPU 1508S F
<b>Memory</b>	
• Work memory, min.	8 Gbyte
• Hard disk memory required for installation	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte
• Hard disk memory required at runtime	1 000 Mbyte
<b>Operating systems</b>	
<b>Runs under operating system</b>	
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit); Windows Embedded Standard 7 with delivery image of the SIMATIC IPC
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D, IPC8x7D; Windows 10 Enterprise 2019 LTSC 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7E, IPC8x7E
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	9.8 Mbyte

## Software Controllers

### SIMATIC S7-1500 Software Controllers Add-on applications

#### ODK 1500S SQL driver, ODK 1500S XML Data Access driver

##### Overview ODK 1500S SQL driver

###### Note

This catalog entry contains non-binding information on a supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

###### Overview

The ODK 1500S SQL driver enables direct access to an SQL database from the PLC program. In this case the database can be installed on the same computer as the S7-1500 Software Controller or in the network.

- Direct data exchange with SQL-based database by means of SQL commands from the PCL program
- Connection to SQL-based database on the same PC or to database servers in the network

##### Technical specifications

Supported SQL commands	<ul style="list-style-type: none"> <li>• SELECT</li> <li>• INSERT</li> <li>• UPDATE</li> <li>• DELETE</li> </ul>
Supported data types	All standard SQL data types
System requirements	SIMATIC IPC with S7-1500 Software Controller or SIMATIC ET 200SP Open Controller STEP 7 in the TIA Portal V13 SP1
<ul style="list-style-type: none"> <li>• Runtime PC</li> <li>• Engineering</li> </ul>	

##### More information

If you are interested, please contact your sales representative:  
<http://www.automation.siemens.com/partner/>

You can find Service and Support at:  
<https://support.industry.siemens.com/cs/ww/en/view/109479140>

##### Overview ODK 1500S XML Data Access driver

###### Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

###### Overview

With the function blocks of the ODK 1500S XML Data Access driver it is possible to access specific information in XML files in the Windows file system from the PLC program.

XPath expressions are used for accessing XML file elements since they provide the highest possible flexibility for processing XML data. This means that extremely large XML files can be edited, too.

The driver offers the following functionality:

- XML data can be read into and processed in the PLC.
- XML data can be modified and written back to the XML file.

##### Technical specifications

System requirements	SIMATIC IPC with SIMATIC S7-1500 Software Controller or SIMATIC ET 200SP Open Controller STEP 7 in TIA Portal V13 SP1
<ul style="list-style-type: none"> <li>• Runtime PC</li> <li>• Engineering</li> </ul>	

##### More information

If you are interested, please contact your sales representative:  
<http://www.automation.siemens.com/partner/>

You can find Service and Support at:  
<https://support.industry.siemens.com/cs/ww/en/view/109479496>

#### Overview ODK 1500S FileServer

##### Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

##### Overview

The ODK 1500S FileServer enhances the SIMATIC S7-1500 Software Controller file function with an option enabling direct access to the Windows file system of the PC from the STEP 7 program.

The driver enables reading and writing of data blocks in/from files in structured form. Various file formats are supported.

There are also FBs available for handling files (e.g. renaming, deleting).

#### Technical specifications

Supported file formats	<ul style="list-style-type: none"> <li>• CSV</li> <li>• ASCII</li> <li>• Windows-INI</li> <li>• XML <sup>1)</sup></li> <li>• Binary</li> </ul>
System requirements	
<ul style="list-style-type: none"> <li>• Runtime PC</li> </ul>	SIMATIC IPC with SIMATIC S7-1500 Software Controller or SIMATIC ET 200SP Open Controller
<ul style="list-style-type: none"> <li>• Engineering</li> </ul>	STEP 7 in TIA Portal V13 SP1

<sup>1)</sup> The XML format is predefined. A DB can be saved and read in as an XML file. It is not possible to parse any particular XML file.

#### More information

If you are interested, please contact your sales representative:  
<http://www.automation.siemens.com/partner/>

You can find Service and Support at:  
<https://support.industry.siemens.com/cs/ww/en/view/109479497>

#### Overview ODK 1500S SMX driver

##### Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

##### Overview

The ODK 1500S SMX driver permits access from a Windows user program to data of the PLC program. A shared memory which can be accessed by the PLC and user program is set up for this purpose. The ODK 1500S simplifies the changeover to the SIMATIC S7-1500 Software Controller of applications that previously used the SMX interface of the SIMATIC WinAC RTX.

#### More information

If you are interested, please contact your sales representative:  
<http://www.automation.siemens.com/partner/>

You can find Service and Support at:  
<https://support.industry.siemens.com/cs/ww/en/view/109741583>

#### Overview ODK 1500S serial driver

##### Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

##### Overview

The ODK 1500S serial driver enables serial communication from the STEP 7 user program via the integrated serial interface of a SIMATIC IPC or, depending on the application environment, via a USB-to-serial adapter. All serial interfaces of the PC are supported, which are addressed in Windows as COM $n$  interface, e.g. RS232, RS422 or RS485.

#### More information

If you are interested, please contact your sales representative:  
<http://www.automation.siemens.com/partner/>

You can find Service and Support at:  
<https://support.industry.siemens.com/cs/ww/en/view/109479259>

## Software Controllers

SIMATIC S7-1500 Software Controllers

Add-on applications

### Notes

## Drive Controllers



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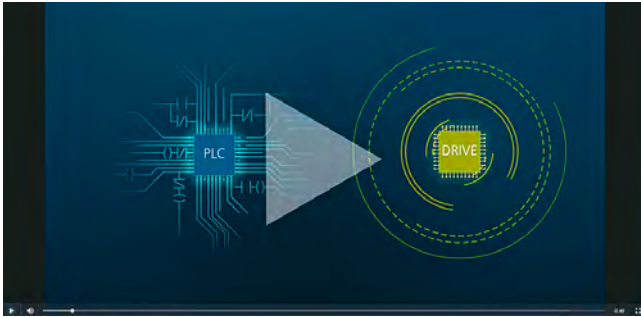
CPU 1504D TF, CPU 1507D TF

## Drive Controllers

### Introduction

#### Drive Controllers

#### Overview



SIMATIC Drive Controller Video

[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6138318810001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6138318810001)



The SIMATIC Drive Controller is available in two performance classes and meets even the most demanding Motion Control needs with the two fail-safe technology CPUs (CPU 1504D TF and CPU 1507D TF).

The fail-safe CPUs permit the processing of standard and safety programs on the same controller.

As technology CPUs, they also have extensive Motion Control functions such as:

- Speed and positioning axes
- Synchronous operation functions
  - Synchronizing with/without specifying the synchronization position
  - Actual value coupling
  - Shifting of the master value at following axis
  - Camming
  - Cross-PLC synchronous operation
- Cam
- Cyclic specification of the motion vector from the application (MotionIn interface)
- Kinematics
  - With up to 4 interpolating axes (e.g. cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA)
  - User-defined kinematics
- External encoders, output cams and measuring inputs

The extensive integrated interfaces and technology I/Os are consistently available in all performance classes and enable the efficient implementation of compact and modular automation solutions with Motion Control based on the SINAMICS S120 drive system.

Thanks to fast system response times, the SIMATIC Drive Controller is the ideal solution wherever axes with high configuration limits and the shortest cycle times for high machine cycle rates and optimum product quality through deterministic and reproducible machine behavior are required.

The SIMATIC Drive Controller is configured in TIA Portal V16 or higher with the SIMATIC STEP 7 Professional engineering software and SINAMICS Startdrive.

The SIMATIC Drive Controller can be extended with components from the modular SINAMICS S120 drive system and SIMATIC automation components such as HMI and I/O systems.

Additional drive systems such as e.g. SINAMICS S210 or SINAMICS G can easily be integrated via PROFINET.

### Overview CPU 1504D TF



CPU 1504D TF

- For standard and fail-safe applications with medium requirements for program scope and processing speed
- Ultra-compact due to the integration of fail-safe SIMATIC S7-1500 technology CPU, SINAMICS S120 drive control and technology I/Os in a single device
- Extensive integrated communication interfaces and technology I/Os for the efficient implementation of automation solutions with Motion Control
- Tried-and-tested engineering in TIA Portal

### Overview CPU 1507D TF



CPU 1507D TF

- For standard and fail-safe applications with high to very high requirements for program scope and processing speed
- Ultra-compact due to the integration of fail-safe SIMATIC S7-1500 technology CPU, SINAMICS S120 drive control and technology I/Os in a single device
- Extensive integrated communication interfaces and technology I/Os for the efficient implementation of automation solutions with Motion Control
- Tried-and-tested engineering in TIA Portal

### Ordering data

#### SIMATIC S7-1500 Drive Controller CPU 1504D TF

With SINAMICS S120 Integrated;  
Fail-safe technology CPU;  
Work memory:  
2 MB for program, 4 MB for data;  
Interfaces: 12 DI, 16 DI/DQ,  
4 DRIVE-CLiQ, 3 PROFINET;  
3+1+1 ports, 1 PROFIBUS;  
SIMATIC Memory Card required

### Article No.

6ES7615-4DF10-0AB0

#### SIMATIC S7-1500 Drive Controller CPU 1507D TF

With SINAMICS S120 Integrated;  
Fail-safe technology CPU;  
Work memory:  
6 MB for program, 20 MB for data;  
Interfaces: 12 DI, 16 DI/DQ,  
4 DRIVE-CLiQ, 3 PROFINET;  
3+1+1 ports, 1 PROFIBUS;  
SIMATIC Memory Card required

6ES7615-7DF10-0AB0

### Accessories

#### SIMATIC Memory Card <sup>1)</sup>

- 4 MB
- 12 MB
- 24 MB
- 256 MB
- 2 GB
- 32 GB

6ES7954-8LC03-0AA0  
6ES7954-8LE03-0AA0  
6ES7954-8LF03-0AA0  
6ES7954-8LL03-0AA0  
6ES7954-8LP03-0AA0  
6ES7954-8LT03-0AA0

### Article No.

*Drive licenses  
for integrated drive control*

#### Safety Integrated Extended Functions

Certificate of License (CoL)  
for a SINAMICS S120 axis

- CoL in paper form
- CoL in electronic form<sup>3)</sup>  
Email address required  
for delivery

6SL3074-0AA10-0AA0  
6SL3074-0AA10-0AH0

#### Safety Integrated Advanced Functions

Certificate of License (CoL)  
for a SINAMICS S120 axis

- CoL in paper form
- CoL in electronic form<sup>3)</sup>  
Email address required  
for delivery

6SL3074-0AA20-0AA0  
6SL3074-0AA20-0AH0

#### Cogging torque compensation

Certificate of License (CoL)  
for a SINAMICS S120 axis

- CoL in paper form
- CoL in electronic form<sup>3)</sup>  
Email address required  
for delivery

6SL3074-0AA15-0AA0  
6SL3074-0AA15-0AH0

<sup>1)</sup> When using the integrated SINAMICS S120 drive control, a memory card size of at least 12 MB is recommended. A memory card size of at least 256 MB is required for firmware updates.

<sup>3)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# Drive Controllers

## Technology CPUs

### CPU 1504D TF, CPU 1507D TF

Ordering data	Article No.	Article No.
<b>Advanced Position Control (APC)</b> Certificate of License (CoL) for a SINAMICS S120 axis <ul style="list-style-type: none"> <li>• CoL in paper form</li> <li>• CoL in electronic form<sup>3)</sup> Email address required for delivery</li> </ul>	<b>6SL3074-0AA05-0AA0</b> <b>6SL3074-0AA05-0AH0</b>	<i>Accessories for PROFIBUS (interface X126)</i> <b>PROFIBUS RS485 bus connector</b> With angular cable outlet (35°) with screw-type terminals, max. transmission rate 12 Mbps <ul style="list-style-type: none"> <li>• Without programming device/PC interface</li> <li>• With programming device/PC interface</li> </ul>
<b>Advanced Synchronous Reluctance Control</b> Certificate of License (CoL) for a SINAMICS S120 axis <ul style="list-style-type: none"> <li>• CoL in paper form</li> <li>• CoL in electronic form<sup>3)</sup> Email address required for delivery</li> </ul>	<b>6SL3074-0AA06-0AA0</b> <b>6SL3074-0AA06-0AH0</b>	<b>PROFIBUS FastConnect RS485 bus connector</b> With angular cable outlet (35°) with insulation displacement technology, max. transmission rate 12 Mbps <ul style="list-style-type: none"> <li>• Without programming device/PC interface</li> <li>• With programming device/PC interface</li> </ul>
<b>Technology Extension VIBX (Vibration Extinction)</b> Certificate of License (CoL) per SINAMICS Integrated <ul style="list-style-type: none"> <li>• CoL in paper form</li> <li>• CoL in electronic form<sup>3)</sup> Email address required for delivery</li> </ul>	<b>6SL3077-0AA00-5AB0</b> <b>6SL3077-0AA00-5AH0</b>	<b>FastConnect cables for PROFIBUS</b> (sold by the meter; max. delivery unit 1 000 m; minimum order quantity 20 m) <ul style="list-style-type: none"> <li>• FC standard cable GP</li> <li>• FC robust cable</li> <li>• FC flexible cable</li> <li>• FC trailing cable, sheath color: Petrol</li> <li>• FC trailing cable, sheath color: Violet</li> <li>• FC food cable</li> <li>• FC ground cable</li> <li>• FC FRNC cable GP</li> </ul>
<b>Technology Extension SERVOUP (Servo Coupling)</b> Certificate of License (CoL) per SINAMICS Integrated <ul style="list-style-type: none"> <li>• CoL in paper form</li> <li>• CoL in electronic form<sup>3)</sup> Email address required for delivery</li> </ul>	<b>6SL3077-0AA00-8AB0</b> <b>6SL3077-0AA00-8AH0</b>	<i>Accessories for PROFIBUS (interface X126)</i> <b>PROFIBUS RS485 bus connector</b> With angular cable outlet (35°) with screw-type terminals, max. transmission rate 12 Mbps <ul style="list-style-type: none"> <li>• Without programming device/PC interface</li> <li>• With programming device/PC interface</li> </ul>
<b>DCB Extension Library</b> Certificate of License (CoL) per SINAMICS Integrated <ul style="list-style-type: none"> <li>• CoL in paper form</li> <li>• CoL in electronic form<sup>3)</sup> Email address required for delivery</li> </ul> For other SINAMICS licenses (controller parameter adaption, dynamic grid support and line droop control), see SIMATIC Drive Controller system manual	<b>6SL3077-0AA00-0AB0</b> <b>6SL3077-0AA00-0AH0</b>	<b>FastConnect cables for PROFIBUS</b> (sold by the meter; max. delivery unit 1 000 m; minimum order quantity 20 m) <ul style="list-style-type: none"> <li>• IE FC standard cable GP 2x2</li> <li>• IE FC flexible cable GP 2x2</li> <li>• IE FC trailing cable GP 2x2</li> <li>• IE FC trailing cable 2x2</li> <li>• IE FC marine cable 2x2</li> </ul>
<b>SIMATIC OPC UA S7-1500 Small</b> Required for CPU 1504D TF Single Runtime License <ul style="list-style-type: none"> <li>• License certificate for OPC UA Server (Data Access and OPC UA Client)</li> <li>• Download incl. license certificate for OPC UA Server (Data Access and OPC UA Client)<sup>3)</sup> Email address required for delivery</li> </ul>	<b>6ES7823-0BA00-1BA0</b> <b>6ES7823-0BE00-1BA0</b>	<i>Accessories for PROFIBUS (interface X126)</i> <b>PROFIBUS RS485 bus connector</b> With angular cable outlet (35°) with screw-type terminals, max. transmission rate 12 Mbps <ul style="list-style-type: none"> <li>• Without programming device/PC interface</li> <li>• With programming device/PC interface</li> </ul>
<b>SIMATIC OPC UA S7-1500 Large</b> Required for CPU 1507D TF Single Runtime License <ul style="list-style-type: none"> <li>• License certificate for OPC UA Server (Data Access and OPC UA Client)</li> <li>• Download incl. license certificate for OPC UA Server (Data Access and OPC UA Client)<sup>3)</sup> Email address required for delivery</li> </ul>	<b>6ES7823-0BA00-1DA0</b> <b>6ES7823-0BE00-1DA0</b>	<b>FastConnect cables for Industrial Ethernet/PROFINET</b> (sold by the meter; max. delivery unit 1 000 m; minimum order quantity 20 m) <ul style="list-style-type: none"> <li>• IE FC standard cable GP 4x2</li> <li>• IE FC flexible cable GP 4x2</li> </ul>

<sup>2)</sup> The Ethernet interface X130 supports 10, 100 and 1 000 Mbps. For 1 000 Mbps, 8-wire cables (4x2) and the 180° FastConnect plug in 1 000 Mbps version must be used.

<sup>3)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



Ordering data	Article No.	Engineering software	Article No.
<p><i>Other accessories</i></p> <p><b>PROFIBUS FastConnect stripping tool</b></p> <p>Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables</p>	<b>6GK1905-6AA00</b>	<p>The following engineering software is required for the SIMATIC Drive Controller:</p> <ul style="list-style-type: none"> <li>STEP 7 Professional V17 for configuring control functionality</li> <li>STEP 7 Safety Advanced V17 for creating safety-related programs</li> <li>S7-PLCSIM Advanced V4.0 for simulation and validation of the control functionality</li> <li>SINAMICS Startdrive Basic V17<sup>4)</sup> or SINAMICS Startdrive Advanced V17 for configuring the integrated drive control (SINAMICS Integrated)</li> <li>SINAMICS DCC V17 (option package for SINAMICS Startdrive) for the graphical configuration of control, computing and logic blocks</li> </ul>	<p>For ordering data for engineering software controllers, see catalog section 12.</p> <p>For ordering data for engineering software drive systems, see Industry Mall: <a href="https://www.siemens.com/industrymall">https://www.siemens.com/industrymall</a></p>
<p><b>IE FC stripping tool</b></p> <p>Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables</p>	<b>6GK1901-1GA00</b>		
<p><b>Dust protection blanking plugs</b></p> <p>For sealing unused DRIVE-CLiQ and PROFINET ports; blanking plug (50 units)</p>	<b>6SL3066-4CA00-0AA0</b>		
<p><i>Spare parts</i></p> <p><b>Bottom cover</b></p>	<b>6ES7615-0AC10-0AA0</b>		
<b>Top cover</b>	<b>6ES7615-0AC10-1AA0</b>		
<b>Spacer</b>	<b>6SL3064-1BB00-0AA0</b>	<p><i>Documentation</i></p> <p><b>SIMATIC Manual Collection</b></p> <p>Electronic manuals on DVD, multilingual</p>	<b>6ES7998-8XC01-8YE0</b>
<p><b>Terminal Kit</b></p> <ul style="list-style-type: none"> <li>3 x I/O plug for X122/X132/X142</li> <li>1 x 24 V plug for X124</li> <li>5 x DRIVE-CLiQ blanking cover</li> </ul>	<b>6SL3064-2CB00-0AA0</b>	<p><b>SIMATIC Manual Collection Update service for 1 year</b></p> <p>Current Manual Collection DVD and the three subsequent updates</p>	<b>6ES7998-8XC01-8YE2</b>

<sup>4)</sup> The SINAMICS Startdrive Basic commissioning tool is available for free on the Internet at: <https://www.siemens.com/startdrive>

### Technical specifications

Article number	<b>6ES7615-4DF10-0AB0</b>	<b>6ES7615-7DF10-0AB0</b>
	SIMATIC Drive Controller, CPU 1504D TF	SIMATIC Drive Controller, CPU 1507D TF
<b>General information</b>		
<p><b>Engineering with</b></p> <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V17 (FW V2.9) / V16 (FW V2.8) or higher	V17 (FW V2.9) / V16 (FW V2.8) or higher
<p><b>Integrated drive control</b></p> <ul style="list-style-type: none"> <li>Number of axes for servo control, max.</li> <li>Number of axes for vector control, max.</li> <li>Number of axes for V/f control, max.</li> <li>Remark</li> </ul>	<p>6</p> <p>6</p> <p>12</p> <p>alternative control modes; drive control based on SINAMICS S120 CU320-2 (firmware version V5.x); functional subset compared to CU320-2: no free function blocks, ... ; for details, see the manual</p>	<p>6</p> <p>6</p> <p>12</p> <p>alternative control modes; drive control based on SINAMICS S120 CU320-2 (firmware version V5.x); functional subset compared to CU320-2: no free function blocks, ... ; for details, see the manual</p>
<b>Supply voltage</b>		
Type of supply voltage	24 V DC	24 V DC

# Drive Controllers

## Technology CPUs

### CPU 1504D TF, CPU 1507D TF

#### Technical specifications

Article number	<b>6ES7615-4DF10-0AB0</b> SIMATIC Drive Controller, CPU 1504D TF	<b>6ES7615-7DF10-0AB0</b> SIMATIC Drive Controller, CPU 1507D TF
<b>Memory</b>		
<b>Work memory</b>		
• integrated (for program)	2 Mbyte	6 Mbyte
• integrated (for data)	4 Mbyte	20 Mbyte
<b>Load memory</b>		
• Plug-in (SIMATIC Memory Card), required	12 Mbyte; Recommended at least when integrated drive is used	12 Mbyte; Recommended at least when integrated drive is used
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
<b>Counters, timers and their retentivity</b>		
<b>S7 counter</b>		
• Number	2 048	2 048
<b>IEC counter</b>		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>		
• Number	2 048	2 048
<b>IEC timer</b>		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>		
<b>Flag</b>		
• Size, max.	16 kbyte	16 kbyte
<b>Address area</b>		
<b>I/O address area</b>		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>		
<b>Clock</b>		
• Type	Hardware clock	Hardware clock
<b>Digital inputs</b>		
integrated channels (DI)	28; max. depending on parameterization	28; max. depending on parameterization
<b>Digital outputs</b>		
integrated channels (DO)	16; max. depending on parameterization	16; max. depending on parameterization
Digital outputs, parameterizable	Yes; 8 DI/DQ (X122/X132, SINAMICS Integrated) + 8 DI/DQ (X142, PLC)	Yes; 8 DI/DQ (X122/X132, SINAMICS Integrated) + 8 DI/DQ (X142, PLC)
Short-circuit protection	Yes; electronic/thermal	Yes; electronic/thermal
<b>1. Interface</b>		
<b>Interface types</b>		
• RJ 45 (Ethernet)	Yes	Yes
• Number of ports	3	3
• integrated switch	Yes	Yes
<b>Protocols</b>		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes

**Technical specifications**

Article number	<b>6ES7615-4DF10-0AB0</b>	<b>6ES7615-7DF10-0AB0</b>
	SIMATIC Drive Controller, CPU 1504D TF	SIMATIC Drive Controller, CPU 1507D TF
<b>PROFINET IO Controller</b>		
<b>Services</b>		
- PG/OP communication	Yes	Yes
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	250 µs
- IRT	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>		
<b>Services</b>		
- PG/OP communication	Yes	Yes
- Isochronous mode	No	No
- shortest clock pulse	500 µs	250 µs
- IRT	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
<b>2. Interface</b>		
<b>Interface types</b>		
• RJ 45 (Ethernet)	Yes	Yes
• Number of ports	1	1
• integrated switch	No	No
<b>Protocols</b>		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No

# Drive Controllers

## Technology CPUs

### CPU 1504D TF, CPU 1507D TF

#### Technical specifications

Article number	<b>6ES7615-4DF10-0AB0</b> SIMATIC Drive Controller, CPU 1504D TF	<b>6ES7615-7DF10-0AB0</b> SIMATIC Drive Controller, CPU 1507D TF
<b>PROFINET IO Controller</b>		
<b>Services</b>		
- PG/OP communication	Yes	Yes
- Isochronous mode	No	No
- Direct data exchange	No	No
- IRT	No	No
- PROFINET energy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
<b>PROFINET IO Device</b>		
<b>Services</b>		
- PG/OP communication	Yes	Yes
- Isochronous mode	No	No
- IRT	No	No
- PROFINET energy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
<b>3. Interface</b>		
<b>Interface types</b>		
• RJ 45 (Ethernet)	Yes	Yes
• Number of ports	1	1
• integrated switch	No	No
<b>Protocols</b>		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	No	No
• PROFINET IO Device	No	No
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes
• Web server	Yes	Yes
<b>4. Interface</b>		
<b>Interface types</b>		
• RS 485	Yes	Yes
• Number of ports	1	1
<b>Protocols</b>		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	No	No
• SIMATIC communication	Yes	Yes

### Technical specifications

Article number	<b>6ES7615-4DF10-0AB0</b> SIMATIC Drive Controller, CPU 1504D TF	<b>6ES7615-7DF10-0AB0</b> SIMATIC Drive Controller, CPU 1507D TF
<b>PROFIBUS DP master</b>		
• Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<b>Protocols</b>		
<b>Number of connections</b>		
• Number of connections, max.	384; Via integrated interfaces of the CPU	384; Via integrated interfaces of the CPU
<b>Redundancy mode</b>		
<b>Media redundancy</b>		
- Media redundancy	only via interface X150	only via interface X150
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as ring node according to IEC 62439-2 Edition 2.0	Yes; as ring node according to IEC 62439-2 Edition 2.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
<b>SIMATIC communication</b>		
• S7 routing	Yes	Yes
<b>OPC UA</b>		
• OPC UA Client	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes
<b>Supported technology objects</b>		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400	12 800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
• Number of available Extended Motion Control resources for technology objects	120	420
• Required Extended Motion Control resources		
- per cam (1 000 points and 50 segments)	2	2
- per cam (10 000 points and 50 segments)	20	20
- for each set of kinematics	30	30
- Per leading axis proxy	3	3
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes

# Drive Controllers

## Technology CPUs

### CPU 1504D TF, CPU 1507D TF

#### Technical specifications

Article number	<b>6ES7615-4DF10-0AB0</b> SIMATIC Drive Controller, CPU 1504D TF	<b>6ES7615-7DF10-0AB0</b> SIMATIC Drive Controller, CPU 1507D TF
<b>Standards, approvals, certificates</b>		
<b>Highest safety class achievable in safety mode</b>		
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>		
- Low demand mode: PFDavg in accordance with SIL2	< 14.00E-04	< 14.00E-04
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05 PLd (if exclusively F-CPU is used)	< 2.00E-05 PLd (if exclusively F-CPU is used)
- High demand/continuous mode: PFH in accordance with SIL2	< 14.00E-09	< 14.00E-09
- High demand/continuous mode: PFH in accordance with SIL3	if exclusively F-CPU is used: < 1.00E-09 (at a site altitude of up to 3000 m); < 2.00E-09 (at a site altitude of more than 3000 m and up to 4000 m)	if exclusively F-CPU is used: < 1.00E-09 (at a site altitude of up to 3000 m); < 2.00E-09 (at a site altitude of more than 3000 m and up to 4000 m)
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	0 °C	0 °C
• max.	55 °C	55 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	4 000 m; as of an altitude of 2000 m, the maximum ambient air temperature is reduced by 7 °C per 1000 m; see SINAMICS documentation for SINAMICS S120 drive components	4 000 m; as of an altitude of 2000 m, the maximum ambient air temperature is reduced by 7 °C per 1000 m; see SINAMICS documentation for SINAMICS S120 drive components
• Ambient air temperature-barometric pressure-altitude	Permissible air pressure: 620 hPa ... 1 060 hPa	Permissible air pressure: 620 hPa ... 1 060 hPa
<b>Configuration</b>		
<b>Programming</b>		
<b>Programming language</b>		
- LAD	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes
- SCL	Yes	Yes
- GRAPH	Yes	Yes
<b>Know-how protection</b>		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
<b>Access protection</b>		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
<b>Dimensions</b>		
Width	50 mm	50 mm
Height	300 mm	300 mm
Depth	226 mm; 270 mm with spacer (included in scope of supply)	226 mm; 270 mm with spacer (included in scope of supply)
<b>Weights</b>		
Weight, approx.	2 400 g	2 400 g
<b>Other</b>		
Note:	The SIMATIC Drive Controller deviates from the usual SIMATIC S7-1500 ambient conditions and specifications as well as the available approvals and certificates because of the drive design. For details, see the SIMATIC Drive Controller device and system manual. Operation is without fan.	The SIMATIC Drive Controller deviates from the usual SIMATIC S7-1500 ambient conditions and specifications as well as the available approvals and certificates because of the drive design. For details, see the SIMATIC Drive Controller device and system manual. Operation is without fan.

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- 10/9 Interface modules
- 10/19 SIPLUS interface modules
- 10/22 I/O modules
- 10/22 Digital input modules
- 10/32 Digital output modules
- 10/49 Analog input modules
- 10/69 Analog output modules
- 10/77 SIPLUS digital inputs
- 10/81 SIPLUS digital outputs
- 10/87 SIPLUS analog inputs
- 10/93 SIPLUS analog outputs
- 10/97 Technology modules
- 10/97 - TM Count 1x24V counter module
- 10/101 - TM PosInput 1 counter and position detection module
- 10/105 - TM Timer DIDQ 10x24V time-based IO module
- 10/108 - TM Pulse 2x24V pulse output module
- 10/111 - TM StepDrive 24...48V/5A stepper motor control (Phytron Co.)
- 10/112 - SIMATIC ET 200SP ECC charging controllers
- 10/118 - SIWAREX WP321
- 10/121 - SIWAREX WP351
- 10/123 - SIPLUS TM Count 1x24V counter module
- 10/125 - SIPLUS TM PosInput 1 counting and position detection module
- 10/127 - SIPLUS TM timer DIDQ 10x24 V time-based IO module
- 10/129 - SIPLUS TM Pulse 2x24V pulse output module
- 10/131 - SIPLUS ET 200SP ECC charging controller
- 10/133 - SIPLUS SIWAREX WP321
- 10/135 Communication
- 10/135 - CM PtP serial interface
- 10/138 - CM 4x IO-Link
- 10/142 - CM 1xDALI
- 10/144 - CM CAN
- 10/146 - CM AS-i Master ST for SIMATIC ET 200SP
- 10/150 - CM DP for ET 200SP CPU
- 10/152 - CP 1542SP-1
- 10/155 - CP 1543SP-1
- 10/158 - CP 1542SP-1 IRC
- 10/161 - SCALANCE W761 RJ45 for the control cabinet
- 10/164 - SCALANCE W722 RJ45 for the control cabinet
- 10/167 - SCALANCE W721 RJ45 for the control cabinet
- 10/170 - SIPLUS CM PtP serial interface
- 10/172 - SIPLUS CM 4x IO-Link
- 10/174 - SIPLUS CM DP for ET 200SP CPU

- 10/176 Fail-safe I/O modules
- 10/176 - Digital F-input modules
- 10/179 - Digital F-output modules
- 10/183 - Digital F-output module relay
- 10/185 - Analog F-input modules
- 10/189 - Special fail-safe modules
- 10/192 - Fail-safe technology modules
- 10/196 - SIPLUS digital F-input modules
- 10/198 - SIPLUS digital F-output modules
- 10/201 - SIPLUS digital F-output module relay
- 10/203 - SIPLUS analog F-input modules
- 10/205 - SIPLUS special fail-safe modules
- 10/207 - Fail-safe communication
- 10/207 - F-CM AS-i Safety ST for SIMATIC ET 200SP
- 10/210 Ex I/O modules
- 10/219 I/O modules
- 10/219 - SIMATIC ET 200SP drive controllers
- 10/219 - SIMATIC MICRO-DRIVE F-TM StepDrive ST
- 10/222 - SIMATIC MICRO-DRIVE F-TM ServoDrive ST
- 10/225 ET 200SP motor starters
- 10/234 Pneumatics
- 10/234 Valve terminals AirLINE SP Typ 8647 (Bürkert Co.)
- 10/235 Power supplies
- 10/235 1-phase, 24 V DC (for SIMATIC ET 200SP)
- 10/239 BaseUnits
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**10/261 SIMATIC ET 200SP HA**

- 10/262 Interface module
- 10/264 Digital I/O modules
- 10/271 Analog I/O modules
- 10/276 Analog/digital module
- 10/279 Fail-safe I/O-modules
- 10/280 Ex I/O modules
- 10/289 Carrier modules
- 10/292 Terminal blocks
- 10/295 BusAdapter
- 10/297 Additional I/O modules

**10/298 SIMATIC ET 200MP**

- 10/300 Interface modules
- 10/300 IM 155-5 PN
- 10/305 IM 155-5 DP
- 10/307 SIPLUS IM 155-5 PN
- 10/309 SIPLUS IM 155-5 DP
- 10/310 I/O modules
- 10/311 Active backplane bus

## I/O systems

**10/313 SIMATIC ET 200M**

- 10/314 [Interface modules](#)
- 10/314 IM 153-1/153-2
- 10/317 IM 153-4 PN
- 10/320 SIPLUS ET 200M IM 153-1/153-2
- 10/323 SIPLUS ET 200M IM 153-4 PN IO
- 10/325 [I/O modules](#)
- 10/325 Digital modules, analog modules
- 10/326 Analog modules with HART
- 10/326 Analog input module with HART
- 10/328 Analog output module with HART
- 10/330 Ex-analog input module with HART
- 10/332 Ex-analog output module with HART
- 10/334 SIPLUS S7-300 analog input module with HART
- 10/335 SIPLUS S7-300 analog output module with HART
- 10/336 SIPLUS S7-300 Ex analog input module with HART
- 10/337 F-digital/analog modules, Ex modules
- 10/338 Function modules
- 10/340 Special modules, Communication, Power supplies

**10/341 SIMATIC ET 200iSP**

- 10/342 Power supply unit
- 10/344 Interface module
- 10/346 Digital electronic modules
- 10/353 Analog electronic modules
- 10/358 Safety-related electronic modules
- 10/362 Watchdog module
- 10/363 RS 485-iS coupler
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- 10/367 [Interface modules](#)
- 10/367 IM 154-1 and IM 154-2
- 10/371 IM 154-3 PN and IM 154-4 PN
- 10/375 [I/O modules](#)
- 10/375 Digital expansion modules
- 10/381 Analog expansion modules
- 10/387 Communication
- 10/387 IO-Link master modules
- 10/388 Fail-safe digital expansion modules
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- 10/392 ET 200pro pneumatic interface
- 10/395 RF170C
- 10/397 [Power supplies](#)
- 10/397 3-phase, DC 24 V (ET200pro PS, IP67)

**10/399 [ET 200pro motor starters](#)**

- 10/399 General data
- 10/404 Standard motor starters
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- 10/407 [ET 200pro Safety motor starters Solutions local/PROFIsafe](#)
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**10/422 SIMATIC ET 200AL**

- 10/423 [Interface modules](#)
- 10/423 IM 157-1 DP
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- 10/427 Digital I/O modules
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- 10/451 [Accessories](#)
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**10/468 SIMATIC ET 200eco PN**

- 10/469 [I/O devices](#)
- 10/469 Digital I/O devices
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- 10/490 Fail-safe I/O device
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- 10/500 [Accessories](#)
- 10/500 Mounting rail, labels

**10/501 IO systems for heating elements****10/502 with integrated power outputs - modular design**

- 10/502 [SIPLUS HCS4200 heating control system](#)
- 10/503 Rack
- 10/505 Central Interface Module (CIM)
- 10/507 Power Output Module (POM)
- 10/511 [SIPLUS HCS4300 heating control system](#)
- 10/512 Central interface module (CIM)
- 10/518 Power Output Module (POM)



**10/523 PROFIBUS components**

- 10/523 Diagnostics
- 10/523 PROFIBUS DP diagnostic repeater
- 10/525 SIPLUS diagnostic repeater for PROFIBUS
- 10/527 PROFIBUS DP ASICs

**10/529 PROFINET components**

- 10/529 Enhanced Real-Time Ethernet Controller ERTEC
- 10/531 Development kits
- 10/532 PROFINET drivers

**10/534 Network components for PROFIBUS Electrical networks (RS 485)**

- 10/534 Active RS 485 terminating element
- 10/535 RS 485 repeater for PROFIBUS
- 10/536 SIPLUS DP active RS 485 terminating element
- 10/538 SIPLUS RS 485 repeater

**10/540 Network transitions**

- 10/540 PN/PN couplers
- 10/543 Power Line Booster
- 10/544 Communications modules
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- 10/546 PN/CAN LINK
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- 10/550 PN/J1939 LINK
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- 10/559 SIMATIC CFU PA Edition
- 10/565 SIMATIC CFU DIQ Edition
- 10/570 BusAdapter
- 10/572 Accessories

## I/O systems

### Introduction

#### I/O systems

#### Overview



#### **SIMATIC ET 200 offers the right solution for every application**

With SIMATIC ET 200 a wide range of distributed I/O systems is available - for solutions in the control cabinet or without a control cabinet directly at the machine, as well as for applications in hazardous areas. The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated add-on modules reduce costs and at the same time offer a widely diverse range of possible applications. You can choose from many different combination options: digital and analog inputs/outputs, intelligent modules with CPU functionality, safety systems, motor starters, pneumatic devices, frequency converters, as well as various different technology modules (e.g. for counting, positioning).

Communication over PROFINET and PROFIBUS, uniform engineering, transparent diagnostic possibilities as well as optimal interfacing to SIMATIC controllers and HMI units prove the unique integration of Totally Integrated Automation.

#### **PROFINET**

PROFINET is the open, cross-vendor Industrial Ethernet standard (IEC 61158/61784) for automation.

Based on Industrial Ethernet, PROFINET enables direct communication between field devices (IO devices) and controllers (IO controllers), up to and including the solution of isochronous drive controls for Motion Control applications.

As PROFINET is based on Standard Ethernet according to IEEE 802.3, any devices from the field level to the management level can be connected.

In this way, PROFINET enables system-wide communication, supports plant-wide engineering and applies IT standards, such as web server or FTP, right down to field level. Tried and tested fieldbus systems, such as PROFIBUS or AS-Interface, can be easily integrated without any modification to the existing devices.

#### **PROFIBUS**

PROFIBUS is the international standard (IEC 61158/61784) for the field level. It is the only fieldbus to allow communication both in manufacturing applications and in process-oriented applications.

PROFIBUS is used to connect field devices, e.g. distributed I/O devices or drives, to automation systems such as SIMATIC S7, SIMOTION, SINUMERIK, or PCs.

PROFIBUS is standardized in accordance with IEC 61158 and is a powerful, open and rugged fieldbus system with short response times. PROFIBUS is available in different forms for various applications.

#### **PROFIBUS DP (distributed I/O)**

PROFIBUS DP is used for connecting distributed field devices, e.g. SIMATIC ET 200, or drives with extremely fast response times. PROFIBUS DP is used when sensors/actuators are distributed at the machine or in the plant (e.g. field level).

#### **AS-Interface**

AS-Interface is the international standard (IEC 62026/EN 50295) which, as an alternative to the cable harness, links especially cost-effective sensors and actuators by means of a two-wire line. This two-wire line is also used to supply the individual stations with power. This makes the AS-Interface the ideal partner for PROFINET and PROFIBUS DP. AS-i communications modules in ET 200SP enable the flexible combination of AS-Interface and distributed I/O. AS-Interface transmits standard data and safety data up to PL e / SIL 3 in the same AS-i network. AS-Interface is not only suitable for efficient transmission of digital and analog I/O signals but also ideal for the user-friendly connection of EMERGENCY STOP pushbuttons and protective doors.

#### **IO-Link**

The communication standard IO-Link permits the intelligent connection of sensors and switching devices to the control level. IO-Link facilitates the integration of all components in the control cabinet and on the field level - for maximum integration and seamless communication on the final meters to the process.

IO-Link solutions from Siemens ensure maximum precision and cost-effectiveness in any production system. IO-Link is completely integrated in Totally Integrated Automation (TIA) and offers many advantages.

- The open standard permits the networking of devices from different manufacturers
- Simple wiring facilitates the installation process
- Reduced wiring effort saves time and money during installation
- Efficient engineering facilitates configuration and commissioning
- High-speed diagnostics ensures short plant standstill times and high plant availability
- High process transparency permits, for example, efficient power management

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## Overview



SIMATIC ET 200SP video

[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6140549987001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6140549987001)

### SIMATIC ET 200SP



The scalable SIMATIC ET 200SP I/O system is a highly flexible, modular I/O system with IP20 degree of protection. Via interface modules, it can exchange IO data of the connected I/O modules with a higher-level PLC. The following interface variants are available for this purpose:

- MultiFieldbus: IM155-6MF with the Ethernet-based protocols PROFINET, EtherNet/IP and Modbus TCP
- PROFINET: IM155-6PN
- PROFIBUS: IM155-6DP

Alternatively, as further head-end stations, various PLC, F-PLC and Open Controllers are available as compact S7-1500 Controllers (Distributed Controllers). ET 200SP components in SIPLUS version meet extreme requirements and have a high degree of robustness.

An extensive range of I/O modules, including fail-safe and Ex versions, enable the flexible connection of sensors and actuators:

- Digital input modules (DI), with color coding white
- Digital output modules (DO), with color coding black
- Analog input modules (AI), with color coding light blue
- Analog output modules (AO), with color coding dark blue
- Technology modules (TM), with color coding turquoise
- Communications modules (CM), with color coding light gray
- Special modules, with color coding mint green
- Motor starters as direct-on-line starters (DS) and reversing starters (RS), also as F-version in each case
- Pneumatics

Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units.

The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

#### Compact design

- Modular configuration with up to 64 modules
- System-integrated, self-assembling potential groups, potential group supply without power module with infeed of supply voltage via light BaseUnits
- Small size and highly flexible due to the modular design and comprehensive product range
- Up to 16 channels per module
- Permanent wiring
- Hot swapping: Module replacement without tools in RUN
- Startup and operation with slot gaps (free spaces)

#### Flexible connection system

- Flexible fieldbus connection via BusAdapter (RJ45, FastConnect, plastic or glass fiber-optic cables), also as integrated media converter
- Push-in terminals for cross-sections up to 1.5 mm<sup>2</sup> with wire end ferrule, and up to 2.5 mm<sup>2</sup> without wire end ferrule
- BaseUnits for 1-wire or direct multi-wire connection
- PotDis module for system-integrated and space-saving provision of additional potential terminals
- Optimum accessibility for wiring due to spring release and measuring tap next to the conductor opening
- System-integrated, space-saving shielding for installation without tools



SIMATIC ET 200SP shielding video

[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6196729280001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6196729280001)

## I/O systems

### SIMATIC ET 200 systems for the control cabinet

#### SIMATIC ET 200SP

#### Overview

##### Safety Integrated

- Easy integration of fail-safe modules
- Easy F parameter assignment via software
- Group-by-group disconnection of non-fail-safe modules

##### High performance

- Isochronous PROFINET
- Internal data transfer with up to 100 Mbps
- Record analog values and output as of 50 µs
- Record digital values and output as of 1 µs

##### High-performance technology

- Modules for the functions Servodrive, Counting, Positioning, Weighing, Output cams, PWM, Force measurement, Flow measurement, etc.

##### Energy efficiency

- Energy meter for recording electrical variables
- System-integrated PROFIenergy with interval substitute values

##### Extended functions

- Configuration control: application-based adaptation of the actual configuration via user software (option handling)
- Time-based IO: time stamping of the signals to the µs
- MSI/MSO: Simultaneous access to I/O data from up to 4 PLCs
- MtM: Direct data exchange between IO modules (**Module-to-Module** communication)
- Oversampling: n-fold acquisition or output of digital and analog signals within a PN cycle
- Adaptation of measuring range: increased resolution by adapting the measuring range to a limited section of a measuring range supported by the analog input module
- Scaling of measured values: permits the transmission of the analog value normalized to the required physical value as a REAL value (32-bit floating point)

##### Communication standards

- PROFINET IO
- EtherNet/IP
- Modbus TCP
- PROFIBUS DP V0/V1
- ET connection for connecting the ET 200AL (IP67)
- IO-Link V1.1
- CAN
- DALI
- AS-Interface
- Point-to-point (RS232, RS485, RS422)
- Freeport
- 3964(R)
- USS
- DMX
- Modbus RTU (master/slave)

##### CPU

- PROFINET connection with 3 ports
- IO controller and PN IO device
- Optional expansion as DP master/slave
- Also as fail-safe version and Open Controller

##### Labeling of I/O modules

- Meaningful labeling on the front of the I/O modules
  - Module type in plain text including function class, e.g. "DI 8x24VDC HF"
  - Article No.
  - 2D matrix code with article and serial number (with call via the "Industry Online Support" app, direct link to the support page of the module)
  - Hardware functional status and firmware version
  - Suitable BU type for the respective I/O module
  - Color code of the suitable color-coding label
  - Connection diagram
- Optionally expandable with
  - Labeling strips
  - Equipment labeling plate

#### Overview of ET 200SP components

Basic components	Function
<b>CPU</b>	<p>The CPU:</p> <ul style="list-style-type: none"> <li>• Executes the user program</li> <li>• Is used as IO controller, I-Device on PROFINET IO, or as standalone CPU</li> <li>• Connects the ET 200SP with the IO devices or the IO controller</li> <li>• Exchanges data with the I/O modules via the backplane bus.</li> </ul> <p>Further functions of the CPU:</p> <ul style="list-style-type: none"> <li>• Communication via PROFIBUS DP (in combination with the CM DP communications module, the CPU can be used as DP master or slave)</li> <li>• Integrated web server</li> <li>• Integrated technology</li> <li>• Integrated trace functionality</li> <li>• Integrated system diagnostics</li> <li>• Integrated safety</li> </ul>

Basic components	Function
<b>Open Controller</b>	<p>As the first controller of this type, the SIMATIC ET 200SP Open Controller combines the functions of a PC-based software controller with visualization, PC applications and central I/Os (inputs/outputs) in a single, compact device.</p> <ul style="list-style-type: none"> <li>• All in one</li> <li>• High system availability</li> <li>• Compact and modular</li> <li>• Rugged</li> <li>• User-friendly design</li> <li>• Efficient engineering in TIA Portal</li> </ul>
<b>Interface modules with MultiFieldbus interface (IM 155-6MF)</b>	<p>The MF interface module:</p> <ul style="list-style-type: none"> <li>• Supports the three Ethernet protocols PROFINET IO, EtherNet IP and Modbus TCP</li> <li>• Is easy to configure via MultiFieldbus Configuration Tool (MFCT)</li> <li>• Connects ET 200SP with the IO controller</li> <li>• Exchanges data with the I/O modules via the backplane bus.</li> </ul>

## Overview

Basic components	Function
<b>Interface modules for PROFINET IO (IM 155-6PN)</b>	The interface module: <ul style="list-style-type: none"> <li>Is used as IO device on PROFINET IO</li> <li>Connects ET 200SP with the IO controller</li> <li>Exchanges data with the I/O modules via the backplane bus.</li> </ul>
<b>Interface module for PROFIBUS DP (IM 155-6DP)</b>	The interface module: <ul style="list-style-type: none"> <li>Is used as DP slave on PROFIBUS DP</li> <li>Connects ET 200SP with the DP master</li> <li>Exchanges data with the I/O modules via the backplane bus.</li> </ul>
<b>SIMATIC BusAdapter (BA)</b>	SIMATIC BusAdapters permit the free selection of the connection system and physical connection for head-end stations with PROFINET or MultiFieldbus interface.  Various versions are available for the connection of copper cables or plastic and glass fiber-optic cables. Hybrid copper/fiber-optic versions are also available as integrated media converters.  Cable length between 2 stations: max. 100 m (Cu), max. 50 m (POF), max 100m (PCF), max. 3 km (multi-mode glass FOC).  For expanding the station with the I/O system ET 200AL via ET connection, the BA-Send BusAdapter is available
<b>BaseUnit (BU)</b>	The BaseUnits provide the electrical and mechanical connection for the ET 200SP components. <ul style="list-style-type: none"> <li>Bright BaseUnits permit a new potential group up to max. 10 A</li> <li>Dark BaseUnits forward the self-assembling voltage busbars P1, P2 and AUX from the left to the right BaseUnit.</li> <li>Suitable BaseUnits with 12 to 28 terminals are available for different connection systems (single or direct multi-conductor connection) and functions.</li> <li>The I/O module is plugged onto the desired BaseUnit and determines the potential assignment of the terminals on the BaseUnit.</li> <li>For expanding the station with the I/O system ET 200AL via ET connection, the BaseUnit BU-Send is available.</li> </ul>

Basic components	Function
<b>Potential distributor modules (PotDis BU, PotDis TB)</b>	With the potential distributor modules for SIMATIC ET 200SP, additional potentials required within an ET 200SP station can be set up quickly and in a space-saving manner. Due to the free combinability of PotDis-BUs and PotDis-TBs, the potential distributor modules allow a large number of design variants and thus simple adaptation to individual needs. Within the station, existing potentials can be multiplied or even new potential groups can be formed. With 36 terminals per 15 mm width, the PotDis modules require very little space without compromising on the conductor cross-sections (maximum 2.5 mm <sup>2</sup> ). They allow the connection of voltages up to 48 V DC with a maximum current carrying capacity of 10 A, and with the PotDis TB-BR-W even up to 230 V AC/10 A as well as the possibility to connect a protective conductor.
<b>I/O modules and fail-safe I/O modules</b>	The I/O module determines the function at the terminals. The PLC detects the current process state via the connected sensors and triggers corresponding responses via the connected actuators. Some I/O modules feature extended functions, in part they are also designed as individual operating mode. I/O modules are divided into the following module types; the fail-safe versions are identified by a preceding 'F-' and a yellow module enclosure: <ul style="list-style-type: none"> <li>DI (digital input)</li> <li>DQ (digital output)</li> <li>AI (analog input)</li> <li>AQ (analog output)</li> <li>TM (technology modules)</li> <li>CM (communications modules)</li> <li>SM (special modules)</li> </ul>
<b>Protective cover (BU cover)</b>	The ET 200SP system can be operated with any number of slot gaps (BU slot without I/O module). Applications for this include: <ul style="list-style-type: none"> <li>partial commissioning</li> <li>prewired, and currently unequipped options</li> </ul> To protect against damage, such slot gaps must be covered by a BU cover. Within the BU cover, an equipment labeling plate can be kept for the possible later use of an I/O module.  Versions: <ul style="list-style-type: none"> <li>for BaseUnits with a width of 15 mm</li> <li>for BaseUnits with a width of 20 mm</li> </ul>

## I/O systems

### SIMATIC ET 200 systems for the control cabinet

#### SIMATIC ET 200SP

#### Overview

Basic components	Function
<b>Server module</b>	The server module concludes the setup of an ET 200SP station. On the server module there are holders for 3 spare fuses (5 x 20 mm). The server module is included in the scope of supply of all head-end stations.
<b>DIN rail according to EN 60715</b>	The DIN rail is the module rack of the ET 200SP I/O system. ET 200SP is mounted on the DIN rail.
<b>Coding element</b>	<p>When plugging an I/O module onto a BaseUnit for the first time, the coding element moves from the I/O module to the BaseUnit. There it prevents the destruction of the ET 200SP components in the event of a subsequent module replacement with incorrectly selected I/O module.</p> <p>The coding element is available in two versions:</p> <ul style="list-style-type: none"> <li>• Mechanical coding element</li> <li>• Electronic coding element: additionally features an electronic, re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules, parameter data for IO-Link master). Thus these data are automatically backed up during a module replacement.</li> </ul>
<b>System-integrated shield connection</b>	<p>The shield connection permits the connection of cable shields. Compared to external shield supports, the system offers the following advantages:</p> <ul style="list-style-type: none"> <li>• Quick installation without tools by plugging the shield connection element onto the BaseUnit</li> <li>• Automatic low-impedance connection to the functional ground (DIN rail)</li> <li>• Optimized EMC properties by separating the supply voltage lines from the signal cables by means of the shield connection element and short, unshielded cable lengths</li> <li>• Low space requirements</li> </ul>
<b>Labeling strips</b>	<p>Optionally, for system-specific marking the head-end stations and I/O modules can be equipped with labeling strips (13 x 31 mm). The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow:</p> <ul style="list-style-type: none"> <li>• 500 strips on the roll, for printing on thermal-transfer printers. Core diameter 40 mm, external diameter 70 mm, width 62 mm.</li> <li>• 10 DIN A4 sheets with 100 strips each, card 180 g/mm<sup>2</sup>, perforated, for printing with a laser printer direct from TIA Portal or via print templates.</li> </ul>

Basic components	Function
<b>Equipment labeling plate</b>	<p>Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, potential distributor modules (PotDis BU and PotDis TB), and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal-transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly:</p> <ul style="list-style-type: none"> <li>• The inscription on the front is not covered</li> <li>• Simple label replacement when replacing a module</li> <li>• No parallax errors when marking the BaseUnits on the mounting plate</li> </ul> <p>The size of the inscribable area of the labels is 14.8 x 10.5 mm (W x H)</p>
<b>Color-coded labels</b>	<p>The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the process terminals. The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals as well as potential distributor modules can also be marked using color-coded labels. Color-coded labels are supplied in packs of 10 or 50 labels. Advantages of the color-coded labels:</p> <ul style="list-style-type: none"> <li>• Quick installation (one label for marking up to 16 terminals)</li> <li>• Avoidance of wiring errors</li> <li>• Simple detection of potentials during servicing</li> </ul>

## Overview



SIMATIC ET 200SP MultiFieldbus video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoid=6144272396001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoid=6144272396001)



Thanks to their wide scope of functions, the interface modules of the scalable SIMATIC ET 200SP I/O system, even in their basic versions, cover a wide range of applications. The basic functions of the interface modules include:

- Short data update times of typically 1 ms
- Single Hot Swap (withdrawing and insertion of an I/O module during operation without impairing the communication with the remaining modules)
- Operation with gaps (empty BaseUnits)
- Complete diagnostic support, extending to channel-by-channel diagnostics
- Configuration control / option handling (adaptation of the actual configuration via user software)
- Device replacement without programming device, with automatic re-initialization, with and without topological configuring
- I&M data 0 to 3 (electronic rating plate with non-volatile storage of plant data)
- Firmware update
- Pluggable 24 V DC supply connection
- Mains/voltage failure buffering time of at least 5 ms or 10 ms
- Labeling option via optional labeling strips and equipment labeling plates

When using PROFINET interface modules, the following basic functions are also included:

- Media redundancy (MRP)
- Integrated 2-port switch
- Freely selectable connection system (Standard function class and above) and physical connection (High Feature function class and above) by means of SIMATIC BusAdapters, also as system-integrated media converter from fiber-optic to copper cable. Can also be used for interface modules with MultiFieldbus interface.
- Reset button for simple return to factory settings without the need for programming device
- Automatic synchronization of the backplane bus to the PROFINET cycle to minimize the response time fluctuations (jitter)

Listed below is a short overview of the interface modules available for the ET 200SP, showing the essential differences. An up-to-date, clear and more precise comparison of functions of the different interface modules is offered by the TIA Selection Tool.

#### SIMATIC IM155-6DP High Feature with PROFIBUS connection

- Max. 32 I/O modules, also PROFIsafe modules with complete diagnostic support.
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 244 bytes in each case for input and output data per module and per station
- Data update time: typ. 5 ms
- PROFIBUS connection via 9-pin D-sub socket
- Package includes server module and PROFIBUS connector with programming device socket

#### SIMATIC IM155-6PN Basic with PROFINET access

- Max. 12 I/O modules, no PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and per station
- Data update time: typ. 1 ms
- PROFINET connection via 2 integrated RJ45 sockets (integrated 2-port switch)
- Package includes server module

#### SIMATIC IM 155-6PN Standard with a PROFINET interface for SIMATIC BusAdapters

- Two types of delivery:
  - As package with IM155-6PN ST, with pre-assembled BA 2xRJ45 BusAdapter, including server module
  - As package with IM155-6PN ST, without BusAdapter, including server module
- Max. 32 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 256 bytes in each case for input and output data per module and max. 512 bytes per station (depending on configuration)
- Data update time: typ. 1 ms
- Selection of the type of connection of the PROFINET by means of SIMATIC BusAdapter (BusAdapter for copper cables only)

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Interface modules > IM 155-6

#### Overview

SIMATIC IM155-6PN/2 High Feature, 2-port IM with one slot for SIMATIC BusAdapter

- Max. 64 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 288 bytes in each case for input and output data per module and max. 1440 bytes per station (depending on configuration)
- Fast data refresh time from 250 µs, also in isochronous mode
- S2 system redundancy
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

SIMATIC IM155-6MF High Feature, MultiFieldbus IM with two slots for SIMATIC BusAdapters

Differences compared to the 2-port IM155-6PN High Feature:

- Multi-protocol capability  
Operation on Ethernet controllers via the PROFINET, EtherNet/IP and Modbus protocols
- Compatible with IM155-6MF High Feature (as of 6ES7155-6AU01-0CN0);  
Exception: Isochronous mode and prioritized startup

SIMATIC IM155-6PN/3 High Feature, 3-port IM with two slots for SIMATIC BusAdapter

Additional functions compared to 2-port High Feature IM:

- Second slot for SIMATIC BusAdapter, max. 3 ports can be used
- Local IO data coupling between up to 4 controllers

SIMATIC IM 155-6PN High Speed with a PROFINET interface for SIMATIC BusAdapters

- Max. 30 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and max. 968 bytes per station (depending on configuration)
- Fast data refresh time from isochronous mode from 125 µs
- Performance upgrade for PROFINET
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

#### Ordering data

#### Article No.

<b>IM155-6MF High Feature MultiFieldbus interface module</b> 2-port IM with server module, without SIMATIC BusAdapter; PROFINET, EtherNet/IP and Modbus TCP	<b>6ES7155-6MU00-0CN0</b>
<b>IM155-6PN Basic PROFINET interface module</b> With server module; two integrated RJ45 sockets	<b>6ES7155-6AR00-0AN0</b>
<b>IM155-6PN Standard PROFINET interface module</b> With server module	
• With attached SIMATIC BA 2xRJ45 BusAdapter	<b>6ES7155-6AA01-0BN0</b>
• Without SIMATIC BusAdapter	<b>6ES7155-6AU01-0BN0</b>
<b>IM155-6PN/2 High Feature PROFINET interface module</b> 2-port IM with server module, without SIMATIC BusAdapter	<b>6ES7155-6AU01-0CN0</b>
<b>IM155-6PN/3 High Feature PROFINET interface module</b> 3-port IM with server module, without SIMATIC BusAdapter	<b>6ES7155-6AU30-0CN0</b>
<b>IM155-6PN High Speed PROFINET interface module</b> With server module, without SIMATIC BusAdapter	<b>6ES7155-6AU00-0DN0</b>
<b>IM155-6DP High Feature PROFIBUS interface module</b> With server module, with PROFIBUS plug with PG socket	<b>6ES7155-6BA01-0CN0</b>
<b>Accessories</b>	
<b>Strain relief for the PROFINET cable</b> System-integrated strain relief for High Feature PN interface modules (5 units)	<b>6ES7193-6RA00-1AN0</b>
<b>SIMATIC BA 2xRJ45 BusAdapter</b> For PROFINET interface modules, standard function class or above; max. cable length 50 m	<b>6ES7193-6AR00-0AA0</b>
<b>SIMATIC BA 2xFC BusAdapter</b> For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	<b>6ES7193-6AF00-0AA0</b>
<b>BA 2xM12 BusAdapter</b> For IM 155-6PN ST, HF; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	<b>6ES7193-6AM00-0AA0</b>
<b>SIMATIC BA 2xSCRJ BusAdapter</b> For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	<b>6ES7193-6AP00-0AA0</b>



Ordering data	Article No.	Article No.
<b>SIMATIC BA SCRJ/RJ45 BusAdapter</b> For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP20-0AA0	<b>Equipment labeling plate</b> 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter
<b>SIMATIC BA SCRJ/FC BusAdapter</b> For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP40-0AA0	<b>DIN rail, 35 mm</b> Length 483 mm for 19" cabinets Length 530 mm for 600 mm cabinets Length 830 mm for 900 mm cabinets Length 2 m
<b>SIMATIC BA 2XLC BusAdapter</b> For PROFINET interface modules from High Feature function class or above; with LC fiber-optic connection; for increased vibration and EMC load capacity; max. cable length 2 km	6ES7193-6AG00-0AA0	<b>Manuals for ET 200SP distributed I/O system</b> SIMATIC ET 200SP Manual Collection: PDF file with the following content: <ul style="list-style-type: none"> <li>• <b>Basic information</b> System manual, product information, overview tables, correction information or manual supplements</li> <li>• <b>Device-specific information</b> Device manuals for the interface modules, PLC, OC and I/O modules, including fail-safe and motor starters</li> <li>• <b>Comprehensive information</b> Function manuals</li> </ul> The ET 200SP Manual Collection can be downloaded from the Internet as a PDF file: <a href="https://support.industry.siemens.com/cs/ww/en/view/84133942">https://support.industry.siemens.com/cs/ww/en/view/84133942</a>
<b>SIMATIC BA LC/RJ45 BusAdapter</b> For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	6ES7193-6AG20-0AA0	
<b>SIMATIC BA LC/FC BusAdapter</b> For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	6ES7193-6AG40-0AA0	
<b>Station expansion with IP67 I/O system ET 200AL</b>		
<b>ET 200SP BA-Send 1 x FC BusAdapter</b>	6ES7193-6AS00-0AA0	
<b>BaseUnit BU-Send</b>	6ES7193-6BN00-0NE0	
<b>Other accessories</b>		
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates
1 000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0	<b>Spare parts</b>
1 000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0	<b>Server module</b> Terminates an ET 200SP station; included in the scope of supply of the interface modules, CPUs and Open Controllers
		<b>Power supply connector for ET 200SP head-end stations (interface module, CPU and open controller)</b> For connecting the 24 V DC supply voltage, push-in version; included in scope of supply of the head-end station with Push-in terminals (10 units)
		6ES7193-4JB00-0AA0

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Interface modules > IM 155-6****Technical specifications**

Article number	<b>6ES7155-6MU00-0CNO</b> ET 200SP, IM155-6MF HF
<b>General information</b>	
Product type designation	IM 155-6 MF HF
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping
• Isochronous mode	No
• Tool changer	Yes; Docking station and docking unit
• Local coupling, IO data	No
• Local coupling, data records	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	via IM155-6PN/2 HF in compatibility mode
• STEP 7 configurable/integrated from version	via IM155-6PN/2 HF in compatibility mode
• PROFINET from GSD version/GSD revision	GSDML V2.3
• Multi Fieldbus Configuration Tool (MFCT)	V1.0 Update 2
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Address area</b>	
<b>Address space per station</b>	
• Address space per station, max.	1 440 byte; Dependent on configuration
<b>Hardware configuration</b>	
<b>Rack</b>	
• Quantity of operable ET 200SP modules, max.	64
• Quantity of operable ET 200AL modules, max.	16
<b>Submodules</b>	
• Number of submodules per station, max.	256
<b>Interfaces</b>	
Number of PROFINET interfaces	1; 2 ports (switch)
<b>1. Interface</b>	
<b>Interface types</b>	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC,
<b>Protocols</b>	
• PROFINET IO Device	Yes
• Open IE communication	Yes
<b>Interface types</b>	
<b>RJ 45 (Ethernet)</b>	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	No
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
<b>Protocols</b>	
Modbus TCP	Yes
<b>Number of connections</b>	
• Number of MtM communication relationships/connections, max.	16

Article number	<b>6ES7155-6MU00-0CNO</b> ET 200SP, IM155-6MF HF
<b>PROFINET IO Device</b>	
<b>Services</b>	
- IRT	No
- PROFIenergy	Yes
- Prioritized startup	No
- Shared device	No
<b>Redundancy mode</b>	
• PROFINET system redundancy (S2)	Yes
- on S7-1500R/H	Yes
- on S7-400H	Yes
• H-Sync forwarding	Yes
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	No
<b>EtherNet/IP</b>	
<b>Services</b>	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Configuration control via Explicit Messaging	No
- Shared device	No
<b>Updating times</b>	
- Requested Packet Interval (RPI)	2 ms
<b>Address area</b>	
- Address space per module, max.	288 byte; (246 byte outputs / 288 byte inputs)
- ForwardOpen (Class1 & 32 bit Header)	500 byte; (246 byte outputs / 500 byte inputs)
- LargeForwardOpen (Class3)	4 002 byte
<b>Connections</b>	
- Number of rack connections	1
<b>Open IE communication</b>	
• TCP/IP	Yes
• UDP	Yes
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
• IGMP	Yes
• Multicast	Yes
• Broadcast	Yes
• IPv4	Yes
• IPv6	No
<b>Interrupts/diagnostics/status information</b>	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red-green-yellow LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter

#### Technical specifications

Article number	<b>6ES7155-6MU00-0CNO</b> ET 200SP, IM155-6MF HF			Article number	<b>6ES7155-6MU00-0CNO</b> ET 200SP, IM155-6MF HF		
<b>Standards, approvals, certificates</b>				<b>Connection method</b>			
Security level	According to Security Level 1 Test Cases V1.1.1			<b>ET-Connection</b>			
<b>Ambient conditions</b>				• via BU/BA Send			
<b>Ambient temperature during operation</b>				Yes; + 16 ET 200AL modules			
• horizontal installation, min.	-30 °C; No condensation			<b>Mechanics/material</b>			
• horizontal installation, max.	60 °C			Strain relief			
• vertical installation, min.	-30 °C; No condensation			Yes; Optional			
• vertical installation, max.	50 °C			<b>Dimensions</b>			
<b>Altitude during operation relating to sea level</b>				Width			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual			Height			
				Depth			
				<b>Weights</b>			
				Weight, approx.			
				120 g; without BusAdapter			
Article number	<b>6ES7155-6AR00-0AN0</b> ET 200SP, IM155-6PN Basic	<b>6ES7155-6AA01-0BN0</b> ET 200SP, IM155-6PN ST incl. BA 2xRJ45	<b>6ES7155-6AU01-0BN0</b> ET 200SP, IM155-6PN ST				
<b>General information</b>							
Product type designation	IM 155-6 PN BA	IM 155-6 PN ST	IM 155-6 PN ST				
<b>Product function</b>							
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3				
• Module swapping during operation (hot swapping)	Yes; Single hot swapping	Yes; Single hot swapping	Yes; Single hot swapping				
• Isochronous mode	No	No	No				
<b>Engineering with</b>							
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1	V14	V14				
• STEP 7 configurable/integrated from version	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP4 and higher				
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -				
<b>Supply voltage</b>							
Rated value (DC)	24 V	24 V	24 V				
Reverse polarity protection	Yes	Yes	Yes				
Short-circuit protection		Yes	Yes				
<b>Input current</b>							
Current consumption (rated value)		450 mA	450 mA				
<b>Address area</b>							
<b>Address space per station</b>							
• Address space per station, max.	32 byte; per input / output	512 byte; Dependent on configuration	512 byte; Dependent on configuration				
<b>Hardware configuration</b>							
<b>Rack</b>							
• Quantity of operable ET 200SP modules, max.	12	32	32				
• Quantity of operable ET 200AL modules, max.	0	16	16				
<b>Submodules</b>							
• Number of submodules per station, max.		256	256				
<b>Interfaces</b>							
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)				

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Interface modules > IM 155-6****Technical specifications**

Article number	<b>6ES7155-6AR00-0AN0</b> ET 200SP, IM155-6PN Basic	<b>6ES7155-6AA01-0BN0</b> ET 200SP, IM155-6PN ST incl. BA 2xRJ45	<b>6ES7155-6AU01-0BN0</b> ET 200SP, IM155-6PN ST
<b>1. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)	Yes; 2 integrated RJ45 ports	Yes; Pre-assembled BusAdapter BA 2x RJ45	
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• BusAdapter (PROFINET)	No	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
<b>Protocols</b>			
• PROFINET IO Device	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Media redundancy	Yes; PROFINET MRP	Yes; PROFINET MRP	Yes; PROFINET MRP
<b>Interface types</b>			
<b>RJ 45 (Ethernet)</b>			
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	No		
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
<b>PROFINET IO Device</b>			
<b>Services</b>			
- IRT	No	Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs	Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs
- PROFIenergy	No	Yes	Yes
- Prioritized startup	No	Yes	Yes
- Shared device	No	Yes	Yes
- Number of IO Controllers with shared device, max.		2	2
<b>Redundancy mode</b>			
• PROFINET system redundancy (S2)	No	No	No
<b>Media redundancy</b>			
- MRP	Yes	Yes	Yes
- MRPD	No	No	No
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
<b>Isochronous mode</b>			
Equidistance	No		
<b>Interrupts/diagnostics/ status information</b>			
Status indicator	Yes	Yes	Yes
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
<b>Standards, approvals, certificates</b>			
Security level		According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1

### Technical specifications

Article number	<b>6ES7155-6AR00-0AN0</b> ET 200SP, IM155-6PN Basic	<b>6ES7155-6AA01-0BN0</b> ET 200SP, IM155-6PN ST incl. BA 2xRJ45	<b>6ES7155-6AU01-0BN0</b> ET 200SP, IM155-6PN ST	
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C	0 °C	0 °C	
• horizontal installation, max.	60 °C	60 °C	60 °C	
• vertical installation, min.	-30 °C	0 °C	0 °C	
• vertical installation, max.	50 °C	50 °C	50 °C	
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m	
<b>Connection method</b>				
<b>ET-Connection</b>				
• via BU/BA Send	No	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules	
<b>Dimensions</b>				
Width	35 mm	50 mm	50 mm	
Height	117 mm	117 mm	117 mm	
Depth	74 mm	74 mm	74 mm	
<b>Weights</b>				
Weight, approx.	125 g	190 g; IM 155-6 PN BA with 2x RJ45 ports and server module	147 g; without BusAdapter	
Article number	<b>6ES7155-6AU01-0CN0</b> ET 200SP, IM155-6PN/2 HF	<b>6ES7155-6AU30-0CN0</b> ET 200SP, IM155-6PN/3 HF	<b>6ES7155-6AU00-0DN0</b> ET 200SP, IM155-6PN HS	<b>6ES7155-6BA01-0CN0</b> ET 200SP, IM155-6DP HF incl. DP-Connect.
<b>General information</b>				
Product type designation	IM 155-6 PN/2 HF	IM 155-6 PN/3 HF	IM 155-6 PN HS	IM 155-6 DP HF
<b>Product function</b>				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping
• Isochronous mode	Yes	Yes	Yes	No
• Tool changer	Yes; Docking station and docking unit	Yes; Docking station and docking unit		
• Local coupling, IO data	No	Yes		
- Number of coupling modules		16		
- Number of coupling submodules per module		4		
• Local coupling, data records	No	No		
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15.1 or higher		STEP 7 V14 or higher	
• STEP 7 configurable/integrated from version	Configurable via GSD file	Configurable via GSD file	V5.5 SP4 and higher	As of V5.5 SP4, only up to FW V3.1
• PROFIBUS from GSD version/GSD revision				One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	- / V2.3	
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
<b>Input current</b>				
Current consumption (rated value)		175 mA; At 24 V, 2 slots 2x RJ45 BusAdapter, no I/O modules		
<b>Address area</b>				
<b>Address space per station</b>				
• Address space per station, max.	1 440 byte; Dependent on configuration	1 440 byte; Dependent on configuration	968 byte; For input and output data respectively	244 byte; per input / output

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Interface modules > IM 155-6****Technical specifications**

Article number	<b>6ES7155-6AU01-0CNO</b> ET 200SP, IM155-6PN/2 HF	<b>6ES7155-6AU30-0CNO</b> ET 200SP, IM155-6PN/3 HF	<b>6ES7155-6AU00-0DNO</b> ET 200SP, IM155-6PN HS	<b>6ES7155-6BA01-0CNO</b> ET 200SP, IM155-6DP HF incl. DP-Connect.
<b>Hardware configuration</b>				
<b>Rack</b>				
• Quantity of operable ET 200SP modules, max.	64	64	30	32
• Quantity of operable ET 200AL modules, max.	16	16	0	16
<b>Submodules</b>				
• Number of submodules per station, max.	256	256	125	
<b>Time stamping</b>				
Accuracy	10 ms			
<b>Interfaces</b>				
Number of PROFINET interfaces	1; 2 ports (switch)	1; 3 ports (switch)	1; 2 ports (switch)	
Number of PROFIBUS interfaces				1
<b>1. Interface</b>				
<b>Interface types</b>				
• RS 485				Yes
• Number of ports	2; via BusAdapter	3; Via 2 BusAdapter slots	2	
• integrated switch	Yes	Yes	Yes	
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC,	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	
• Output current of the interface, max.				90 mA
<b>Protocols</b>				
• PROFINET IO Device	Yes	Yes	Yes	
• PROFIBUS DP slave				Yes
• Open IE communication	Yes	Yes	Yes	
• Media redundancy	Yes; PROFINET MRP	Yes; PROFINET MRP	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring	
<b>Interface types</b>				
<b>RJ 45 (Ethernet)</b>				
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• 10 Mbps	No	No	No	
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• Autonegotiation	Yes	Yes	Yes	
• Autocrossing	Yes	Yes	Yes	
<b>RS 485</b>				
• Transmission rate, max.				12 Mbit/s
<b>Protocols</b>				
<b>Number of connections</b>				
• Number of MtM communication relationships/connections, max.	16	16		
<b>PROFINET IO Device Services</b>				
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	Yes; 125 µs, 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	
- PROFIenergy	Yes	Yes	Yes	
- Prioritized startup	Yes	Yes	Yes	
- Shared device	Yes	Yes	Yes	
- Number of IO Controllers with shared device, max.	4	4	4	

#### Technical specifications

Article number	6ES7155-6AU01-0CN0 ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CN0 ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.
<b>Redundancy mode</b>				
• PROFINET system redundancy (S2)	Yes; NAP S2	Yes; NAP S2	No	
• Redundant PROFINET configuration (R1)		No		
• H-Sync forwarding	Yes	Yes		
<b>Media redundancy</b>				
- MRP	Yes	Yes	Yes	
- MRPD	No	No	Yes	
<b>Open IE communication</b>				
• TCP/IP	Yes	Yes	Yes	No
• SNMP	Yes	Yes	Yes	
• LLDP	Yes	Yes	Yes	
<b>PROFIBUS DP</b>				
<b>Services</b>				
- SYNC capability				Yes
- FREEZE capability				Yes
- DPV0				Yes
- DPV1				Yes
<b>Isochronous mode</b>				
Equidistance	Yes	Yes	Yes	
shortest clock pulse	250 µs	250 µs	125 µs	
max. cycle	4 ms	4 ms	4 ms	
Bus cycle time (TDP), min.	250 µs	250 µs	125 µs	
<b>Interrupts/diagnostics/ status information</b>				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	
• Connection display DP				Yes; green DP LED
<b>Standards, approvals, certificates</b>				
Security level	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C; No condensation	-30 °C	-25 °C; No condensation	-25 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; No condensation	-30 °C	-25 °C; No condensation	-25 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**Interface modules > IM 155-6****Technical specifications**

Article number	<b>6ES7155-6AU01-0CN0</b> ET 200SP, IM155-6PN/2 HF	<b>6ES7155-6AU30-0CN0</b> ET 200SP, IM155-6PN/3 HF	<b>6ES7155-6AU00-0DN0</b> ET 200SP, IM155-6PN HS	<b>6ES7155-6BA01-0CN0</b> ET 200SP, IM155-6DP HF incl. DP-Connect.
<b>Connection method</b>				
<b>ET-Connection</b>				
• via BU/BA Send	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules	No	Yes; + 16 ET 200AL modules
<b>Mechanics/material</b>				
Strain relief	Yes; Optional	Yes; Optional		
<b>Dimensions</b>				
Width	50 mm	100 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm	74 mm
<b>Weights</b>				
Weight, approx.	120 g; without BusAdapter	220 g; without BusAdapter	147 g; without BusAdapter	150 g



## Overview



- Interface modules for linking the I/O modules to a higher-level PLC with PROFINET or PROFIBUS
- Server module included in the scope of supply
- Station expansion with IP67 I/O system ET 200AL via ET-connection to BU-Send / BA-Send
- PROFINET bus connection
  - 2 ports for line configuration
  - PN connection selected via BusAdapter (ST, HF)
  - Two integrated RJ45 sockets (BA)
- PROFIBUS bus connection
  - 9-pin sub D socket
  - PROFIBUS connector included in scope of supply
  - Hot swapping (module replacement during operation)
  - Startup and operation with gaps
  - Dynamic re-parameterization in RUN mode
  - Configuration control (option handling)
  - Pluggable 24 V DC supply connector
  - Electronically readable rating plate (I&M data)

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS PROFINET IM155-6PN  
Standard interface module**

(Extended temperature range and exposure to environmental substances)

IM 155-6PN ST, with server module and installed BusAdapter BA 2xRJ45, plus extended power failure backup time

**6AG1155-6AA01-7BN0****SIPLUS interface module  
High Feature**

(Extended temperature range and exposure to environmental substances)

IM 155-6DP HF, with server module, with multi-hot-swap, incl. PROFIBUS connector

**6AG1155-6BA01-7CN0**

IM 155-6PN HF, incl. server module, without BusAdapter

- Temperature range -40...+60 °C
- Temperature range -40...+70 °C

**6AG1155-6AU01-2CN0****6AG1155-6AU01-7CN0****6AG1155-6AU01-7BN0**

IM 155-6PN HF, including server module, without BusAdapter, plus extended power failure backup time

**Accessories****SIPLUS Mounting Kit ET 200SP****6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter BA 2xRJ45

**Other accessories**

See SIMATIC ET 200SP, IM 155-6 interface module, page 10/10

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Interface modules > SIPLUS interface modules

#### Technical specifications

Article number	6AG1155-6AA01-7BNO	6AG1155-6AU01-2CNO	6AG1155-6AU01-7CNO	6AG1155-6AU01-7BNO	6AG1155-6BA01-7CNO
Based on	6ES7155-6AA01-0BNO	6ES7155-6AU01-2CNO	6ES7155-6AU01-0CNO	6ES7155-6AU01-0BNO	6ES7155-6BA01-0CNO
	SIPLUS ET 200SP IM155-6PN ST / BA	SIPLUS ET 200SP IM155-6PN HF	SIPLUS ET 200SP IM155-6PN HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6DP HF
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>					
<b>Coolants and lubricants</b>					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

#### Technical specifications

Article number	6AG1155-6AA01-7BNO	6AG1155-6AU01-2CNO	6AG1155-6AU01-7CNO	6AG1155-6AU01-7BNO	6AG1155-6BA01-7CNO
Based on	6ES7155-6AA01-0BNO	6ES7155-6AU01-2CNO	6ES7155-6AU01-0CNO	6ES7155-6AU01-0BNO	6ES7155-6BA01-0CNO
	SIPLUS ET 200SP IM155-6PN ST / BA	SIPLUS ET 200SP IM155-6PN HF	SIPLUS ET 200SP IM155-6PN HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6DP HF
<b>Use on ships/at sea</b>					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6		Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Digital input modules

#### Overview



- 4, 8 and 16-channel digital input (DI) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with additional potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)

- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for rated voltages of up to 24 V DC or 230 V AC
- PNP (sinking input) and NPN (sourcing input) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other PLCs)
  - Counting operating mode (multi-channel counter for pulse generators with 32-bit counting width and up to 10 kHz counting frequency)
  - Oversampling operating mode (n-fold equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Parameterizable input delay time
  - Isochronous mode (simultaneous equidistant reading of all input channels)
  - Hardware interrupts
  - Pulse extension
  - Re-parameterization during operation
  - Firmware update
  - Diagnosis of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the input signal in the process image)
  - Supports the PROFlenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

#### Overview of digital input modules

Digital input	PU	Article No.	CC code	BU type
DI 16 x 24 V DC ST	1	6ES7131-6BH01-0BA0	CC00	A0
DI 16 x 24 V DC ST	10	6ES7131-6BH01-2BA0	CC00	A0
DI 8 x 24 V DC BA	1	6ES7131-6BF01-0AA0	CC01	A0
DI 8 x 24 V DC BA	10	6ES7131-6BF01-2AA0	CC01	A0
DI 8 x 24 V DC SRC BA	1	6ES7131-6BF61-0AA0	CC02	A0
DI 8 x 24 V DC ST	1	6ES7131-6BF01-0BA0	CC01	A0
DI 8 x 24 V DC ST	10	6ES7131-6BF01-2BA0	CC01	A0
DI 8 x 24 V DC HF	1	6ES7131-6BF00-0CA0	CC01	A0
DI 8 x 24 V DC HF	10	6ES7131-6BF00-2CA0	CC01	A0
DI 8 x NAMUR HF	1	6ES7131-6TF00-0CA0	CC01	A0
DI 8 x 24 V DC HS	1	6ES7131-6BF00-0DA0	CC01	A0
With three operating modes:				
• High-speed isochronous DI				
• 4 pulse counters, 32-bit, 10 kHz				
• Oversampling				
DI 4 x 120 ... 230 V AC ST	1	6ES7131-6FD01-0BB1	CC41	B1
DI 8 x 24 V AC ... 48 V UC	1	6ES7131-6CF00-0AU0	CC20	U0

## Overview

### Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC00 to CC05	CC71 to CC73
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC00 to CC05	CC71 to CC73
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC00 to CC05	--
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC00 to CC05	--
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC00 to CC05	CC71 to CC73
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC00 to CC05	CC71 to CC73
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC00 to CC05	--
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC00 to CC05	--
<b>BU type B1</b> • Forwarding of the potential group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
<b>BU type B1</b> • Forwarding of the potential group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
<b>BU type U0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
<b>BU type U0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
<b>BU type U0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
<b>BU type U0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Digital input modules****Overview**

Overview of potential distributor modules

Potential distributor module	PU	Article No.	CC codes for push-in terminals
<b>PotDis BU</b> Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
<b>PotDis BU</b> Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
<b>PotDis BU</b> Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
<b>PotDis BU</b> Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
<b>PotDis TB</b> Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
<b>PotDis TB</b> Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
<b>PotDis TB</b> Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
<b>PotDis TB</b> Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

**Ordering data****Digital input modules**

Delivery options:

Apart from the standard type of delivery in single-unit package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

The number of modules required is the number of modules ordered. The pack type is selected by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.

Digital input module  
DI 8x24VDC Basic, BU type A0, color code CC01

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10

Digital input module  
DI 8x24VDC Sourcing Input, Basic, BU type A0, color code CC02; PU: 1 unit

**Article No.**

**6ES7131-6BF01-0AA0**  
**6ES7131-6BF01-2AA0**

**6ES7131-6BF61-0AA0**

**Article No.**

Digital input module  
DI 8x24VDC Standard,  
BU type A0, color code CC01

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10

**6ES7131-6BF01-0BA0**  
**6ES7131-6BF01-2BA0**

Digital input module  
DI 16 x 24 V DC Standard,  
BU type A0, color code CC00

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10

**6ES7131-6BH01-0BA0**  
**6ES7131-6BH01-2BA0**

Digital input module  
DI 8x24VDC High Feature,  
BU type A0, color code CC01,  
channel-specific diagnostics,  
isochronous mode,  
shared input (MSI); PU: 1 unit

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10

**6ES7131-6BF00-0CA0**  
**6ES7131-6BF00-2CA0**

Ordering data	Article No.	Article No.
Digital input module DI 8x24VDC High Speed, BU type A0, color code CC01; 3 operating modes (fast isochronous DI, 4 pulse counters 32-bit 10 kHz, oversampling); PU: 1 unit	<b>6ES7131-6BF00-0DA0</b>	<b>2BU15-P16+A0+2B</b> Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the potential group • Pack of 1 unit
Digital input module DI 8xNAMUR High Feature, BU type A0, color code CC01; PU: 1 unit	<b>6ES7131-6TF00-0CA0</b>	<b>6ES7193-6BP60-0BA0</b>
Digital input module DI 4x120VAC-230VAC Standard, BU type B1, color code CC41; PU: 1 unit	<b>6ES7131-6FD01-0BB1</b>	<b>BU20-P12+A0+4B</b> BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the potential group; 1 unit • Pack of 1 unit
Digital input module DI 8x24VAC-48VUC Basic, BU type U0, color code CC20, module diagnostics, PU: 1 unit	<b>6ES7131-6CF00-0AU0</b>	<b>6ES7193-6BP20-0BB1</b> <b>6ES7193-6BP20-2BB1</b> • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10
<b>Suitable BaseUnits</b>		<b>BU20-P16+A0+2D</b> BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10
<b>BU15-P16+A10+2D</b> BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10	<b>6ES7193-6BP20-0DA0</b> <b>6ES7193-6BP20-2DA0</b>	<b>6ES7193-6BP00-0DU0</b> <b>6ES7193-6BP00-2DU0</b>
<b>BU15-P16+A0+2D</b> BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10	<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP00-2DA0</b>	<b>BU20-P16+A0+2B</b> BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10
<b>2BU15-P16+A0+2DB</b> Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit	<b>6ES7193-6BP60-0DA0</b>	<b>6ES7193-6BP00-0BU0</b> <b>6ES7193-6BP00-2BU0</b>
<b>BU15-P16+A10+2B</b> BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10	<b>6ES7193-6BP20-0BA0</b> <b>6ES7193-6BP20-2BA0</b>	<b>Potential distributor modules</b>
<b>BU15-P16+A0+2B</b> BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>	<b>PotDis BU</b> PotDis BU, Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A) <b>6ES7193-6UP00-ODP1</b> PotDis BU, Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group <b>6ES7193-6UP00-0BP1</b> PotDis BU, Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A) <b>6ES7193-6UP00-ODP2</b> PotDis BU, Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group <b>6ES7193-6UP00-0BP2</b>
		<b>PotDis TB</b> PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A) <b>6ES7193-6TP00-0TP0</b> PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A) <b>6ES7193-6TP00-0TP1</b> PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A) <b>6ES7193-6TP00-0TP2</b> PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX <b>6ES7193-6TP00-0TN0</b>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Digital input modules****Ordering data****Article No.****Article No.****Accessories****Equipment labeling plate**

10 sheets of 16 labels, for printing with thermal transfer card printer or plotter

**6ES7193-6LF30-0AW0****Labeling strips**

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AG0**

1 000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer

**6ES7193-6LA10-0AA0**

1 000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer

**6ES7193-6LA10-0AG0****BU cover**

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

**6ES7133-6CV15-1AM0****6ES7133-6CV20-1AM0****Shield connection**

5 shield supports and 5 shield terminals

**6ES7193-6SC00-1AM0****Color-coded labels for 15 mm-wide BaseUnits**

Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units

**6ES7193-6CP00-2MA0**

Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units

**6ES7193-6CP01-2MA0**

Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units

**6ES7193-6CP01-4MA0**

Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units

**6ES7193-6CP02-2MA0**

Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units

**6ES7193-6CP02-4MA0**

Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units

**6ES7193-6CP71-2AA0**

Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units

**6ES7193-6CP72-2AA0**

Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units

**6ES7193-6CP73-2AA0**

Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units

**6ES7193-6CP73-4AA0****Color-coded labels for 20 mm-wide BaseUnits**

Color code CC41, for 16 push-in terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units

**6ES7193-6CP41-2MB0****Color-coded labels for PotDis BU**

Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units

**6ES7193-6CP62-2MA0**

Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units

**6ES7193-6CP63-2MA0****Color-coded labels for PotDis TB**

Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units

**6ES7193-6CP10-2MT0**

Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units

**6ES7193-6CP11-2MT0**

Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units

**6ES7193-6CP12-2MT0**

Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units

**6ES7193-6CP13-2MT0****Mechanical coding elements**

For automatic coding of I/O modules; spare part. 20 units

Type A

**6ES7193-6KA00-3AA0**

Type B

**6ES7193-6KB00-3AA0**

Type C

**6ES7193-6KC00-3AA0**

Type D

**6ES7193-6KD00-3AA0**



**Technical specifications**

Article number	<b>6ES7131-6BF01-0AA0</b> ET 200SP, DI 8x 24V DC Basic, PU 1	<b>6ES7131-6BF61-0AA0</b> ET 200SP, DI 8x 24V DC SRC BA	<b>6ES7131-6BF01-0BA0</b> ET 200SP, DI 8x 24V DC ST, PU 1	<b>6ES7131-6BH01-0BA0</b> ET 200SP, DI 16x 24V DC ST, PU 1
<b>General information</b>				
Product type designation	DI 8x24VDC BA	DI 8x24 VDC SRC BA	DI 8x24 VDC ST	DI 16x24VDC ST
<b>Product function</b>				
• Isochronous mode	No	No	No	No
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/ integrated from version	V14	V14	V14	V14
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 or higher	V5.5 SP3
• PCS 7 configurable/integrated from version			V8.1 SP1	V8.1 SP1
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
<b>Operating mode</b>				
• DI	Yes	Yes	Yes	Yes
• Counter	No	No	No	No
• Oversampling	No	No	No	No
• MSI	No	No	No	No
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
<b>Encoder supply</b>				
Number of outputs	8		8	
Short-circuit protection	Yes; per module	No	Yes; per module	
<b>24 V encoder supply</b>				
• 24 V	Yes		Yes	No
• Short-circuit protection	Yes		Yes	
• Output current, max.			700 mA	
• Output current per channel, max.	700 mA		700 mA	
• Output current per module, max.	700 mA		700 mA	
<b>Digital inputs</b>				
Number of digital inputs	8	8	8	16
Digital inputs, parameterizable	Yes	Yes	Yes	Yes
Source/sink input	P-reading	Sourcing	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes		
Input characteristic curve in accordance with IEC 61131, type 2	Yes			
Input characteristic curve in accordance with IEC 61131, type 3	Yes		Yes	Yes
<b>Input voltage</b>				
• Rated value (DC)	24 V	24 V	24 V	24 V
- 24 V DC	Yes	Yes	Yes	Yes
• for signal *0*	-30 to +5 V	30 V to -5 V (reference potential is L+)	-30 to +5 V	-30 to +5 V
• for signal *1*	+11 to +30V	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V
<b>Input current</b>				
• for signal *1*, typ.	6.8 mA	6 mA	2.5 mA	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>				
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Digital input modules****Technical specifications**

Article number	<b>6ES7131-6BF01-0AA0</b> ET 200SP, DI 8x 24V DC Basic, PU 1	<b>6ES7131-6BF61-0AA0</b> ET 200SP, DI 8x 24V DC SRC BA	<b>6ES7131-6BF01-0BA0</b> ET 200SP, DI 8x 24V DC ST, PU 1	<b>6ES7131-6BH01-0BA0</b> ET 200SP, DI 16x 24V DC ST, PU 1
<b>Encoder</b>				
<b>Connectable encoders</b>				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1.5 mA	1.5 mA	1.5 mA
<b>Interrupts/diagnostics/ status information</b>				
Diagnostics function	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	Yes
<b>Diagnoses</b>				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
- parameterizable	Yes	Yes	Yes	Yes
• Monitoring of encoder power supply	No	No	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No
• Wire-break	No	No	Yes; Module-wise	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm
• Short-circuit	No	No	Yes; Module-wise	No
• Group error	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>				
<b>Potential separation channels</b>				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
Suitable for safety functions		No		
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>				
Weight, approx.	28 g	28 g	28 g	28 g

**Technical specifications**

Article number	<b>6ES7131-6BF00-0CA0</b>	<b>6ES7131-6BF00-0DA0</b>	<b>6ES7131-6TF00-0CA0</b>	<b>6ES7131-6FD01-0BB1</b>	<b>6ES7131-6CF00-0AU0</b>
	ET 200SP, DI 8x24VDC HF, PU 1	ET 200SP, DI 8x24VDC High Speed	ET 200SP, DI 8xNAMUR HF	ET 200SP, DI 4x 120...230VvAC ST	ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
<b>General information</b>					
Product type designation	DI 8x24 V DC HF	DI 8x24 V DC HS	DI 8xNAMUR HF	DI 4x120 ... 230 V AC ST	DI 8x24VAC/48VUC BA
<b>Product function</b>					
• Isochronous mode	Yes	Yes	No	No	No
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1	V13 / V13	V14	V15
• STEP 7 configurable/integrated from version	V5.5 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3	
• PCS 7 configurable/integrated from version	V8.1 SP1				
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
<b>Operating mode</b>					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	No	Yes	No	No	No
• Oversampling	No	Yes	No	No	No
• MSI	Yes	No	No	No	No
<b>Supply voltage</b>					
Rated value (DC)	24 V	24 V	24 V		48 V
Rated value (AC)				230 V	48 V; 24 V/48 V; 50 Hz/60 Hz
Reverse polarity protection	Yes	Yes	Yes	No	Yes
<b>Encoder supply</b>					
Number of outputs	8		8	4	8
Short-circuit protection	Yes		Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided	Yes; Per module, 5x 20 mm fuse, 2 A/250 V, quick-response, replaceable
<b>Output current</b>					
• up to 60 °C, max.				10 A	1 A
<b>24 V encoder supply</b>					
• 24 V	Yes	Yes	No		No
• Short-circuit protection	Yes; per channel, electronic	Yes; per module, electronic	No		
• Output current, max.		700 mA			
• Output current per channel, max.	700 mA				
• Output current per module, max.	700 mA				
<b>Digital inputs</b>					
Number of digital inputs	8	8	8; NAMUR	4	8
Digital inputs, parameterizable	Yes		Yes		
Source/sink input	P-reading	P-reading			P-reading
Input characteristic curve in accordance with IEC 61131, type 1					Yes
Input characteristic curve in accordance with IEC 61131, type 2					No
Input characteristic curve in accordance with IEC 61131, type 3	Yes			Yes	No
Pulse extension	Yes; Pulse duration from 4 µs	Yes	Yes; 0.5 s, 1 s, 2 s		No
• Length	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Edge evaluation	Yes; rising edge, falling edge, edge change		Yes; rising edge, falling edge, edge change		
Signal change flutter			Yes; 2 to 32 signal changes		
Flutter observation window			Yes; 0.5 s, 1 s to 100 s in 1-s steps		

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Digital input modules

#### Technical specifications

Article number	6ES7131-6BF00-0CA0	6ES7131-6BF00-0DA0	6ES7131-6TF00-0CA0	6ES7131-6FD01-0BB1	6ES7131-6CF00-0AU0
	ET 200SP, DI 8x24VDC HF, PU 1	ET 200SP, DI 8x24VDC High Speed	ET 200SP, DI 8xNAMUR HF	ET 200SP, DI 4x 120..230VvAC ST	ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
<b>Digital input functions, parameterizable</b>					
• Gate start/stop		Yes			
• Freely usable digital input		Yes			
• Counter		Yes			
• Digital input with oversampling		Yes			
<b>Input voltage</b>					
• Rated value (DC)	24 V	24 V	8.2 V		
- 24 V DC	Yes				
• Rated value (AC)				230 V	
• for signal *0*	-30 to +5 V	-30 to +5 V		0V AC to 40V AC	AC/DC < 10 V
• for signal *1*	+11 to +30V	+11 to +30V		74 V AC to 264 V AC	AC > 14 V, DC > 34 V
<b>Input current</b>					
• for signal *1*, typ.	2.5 mA	6 mA		10.8 mA	3.5 mA
<b>for 10 k switched contact</b>					
- for signal *0*			0.35 to 1.2 mA		
- for signal *1*			2.1 to 7 mA		
<b>for unswitched contact</b>					
- for signal *0*, max. (permissible quiescent current)			0.5 mA		
- for signal *1*			typ. 8 mA		
<b>for NAMUR encoders</b>					
- for signal *0*			0.35 to 1.2 mA		
- for signal *1*			2.1 to 7 mA		
<b>Input delay (for rated value of input voltage)</b>					
• tolerated changeover time for changeover contacts			300 ms		
<b>for standard inputs</b>					
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	No
<b>for interrupt inputs</b>					
- parameterizable		Yes			
<b>for technological functions</b>					
- parameterizable		Yes			
<b>Encoder</b>					
<b>Connectable encoders</b>					
• NAMUR encoder/changeover contact according to EN 60947			Yes		
• Single contact / changeover contact unconnected			Yes		
• Single contact / changeover contact connected with 10 kΩ			Yes		
• 2-wire sensor	Yes	Yes		Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA			
<b>Isochronous mode</b>					
Filtering and processing time (TCI), min.	420 µs				
Bus cycle time (TDP), min.	500 µs	125 µs			
<b>Interrupts/diagnostics/ status information</b>					
Diagnostics function	Yes	Yes	Yes		Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes; channel by channel	Yes	Yes; channel by channel	No	Yes
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7	Yes	Yes; Parameterizable, channels 0 to 7	No	

**Technical specifications**

Article number	6ES7131-6BF00-0CA0	6ES7131-6BF00-0DA0	6ES7131-6TF00-0CA0	6ES7131-6FD01-0BB1	6ES7131-6CF00-0AU0
	ET 200SP, DI 8x24VDC HF, PU 1	ET 200SP, DI 8x24VDC High Speed	ET 200SP, DI 8xNAMUR HF	ET 200SP, DI 4x 120..230VvAC ST	ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
<b>Diagnoses</b>					
• Diagnostic information readable	Yes	Yes	Yes		Yes
• Monitoring the supply voltage	Yes	Yes	Yes	No	Yes
- parameterizable	Yes	Yes	Yes		
• Monitoring of encoder power supply	Yes; channel by channel	Yes; Module-wise	No		Yes
• Wire-break	Yes; Channel by channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No	Yes; channel by channel	No	
• Short-circuit	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	No	
• Group error					Yes
<b>Diagnostics indication LED</b>					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	No	Yes; red LED	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>					
<b>Potential separation channels</b>					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
Suitable for safety functions	No	No	No	No	No
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS04	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS04	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
<b>Dimensions</b>					
Width	15 mm	15 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>					
Weight, approx.	28 g	28 g	32 g	36 g	40 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Digital output modules

#### Overview



- 4, 8 and 16-channel digital output (DQ) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DQ (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting actuators with rated load voltages of up to 120 V DC or 230 V AC and load currents of up to 5 A (depending on module)

- Relay modules
  - NO contact or changeover contact
  - for load or signal voltages (coupling relay)
  - with manual operation (as simulation module for inputs and outputs, jog mode for commissioning or emergency operation on failure of PLC)
- PNP (sourcing output) and NPN (sinking output) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSO operating mode (simultaneous reading of output data from as many as three other PLCs)
  - Pulse width modulation mode (output value as pulse-pause ratio of between 0.0% and 100.0% for controlling the output current)
  - Oversampling operating mode (n-fold equidistant output of digital values within a PN cycle for the precise time control of an output or a sequence of output values)
  - Isochronous mode (simultaneous equidistant output of all output channels)
  - Output of substitute value in the event of interruptions to communication (0, 1 or last value retained)
  - Re-parameterization during operation
  - Firmware update
  - Valve control (output signal does not switch automatically after a set pickup time to a current-saving PWM output)
  - Diagnosis of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the output signal in the process image)
  - Supports the PROFlenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the different DQ modules is offered by the TIA Selection Tool.

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## Overview

### Overview of digital output modules

Digital output	PU	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A BA	1	6ES7132-6BH00-0AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A BA	10	6ES7132-6BH00-2AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	1	6ES7132-6BH01-0BA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	10	6ES7132-6BH01-2BA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6ES7132-6BF61-0AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A BA	1	6ES7132-6BF01-0AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A BA	10	6ES7132-6BF01-2AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	1	6ES7132-6BF01-0BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	10	6ES7132-6BF01-2BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6ES7132-6BF00-0CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	10	6ES7132-6BF00-2CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6ES7132-6BD20-0BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	10	6ES7132-6BD20-2BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6ES7132-6BD20-0CA0	CC02	A0
DQ 4 x 24 V DC/2 A HS	1	6ES7132-6BD20-0DA0	CC02	A0
With three operating modes: • Fast isochronous DQ with valve control • Pulse width modulation • Oversampling				
DQ 4 x 24 ... 230 V AC/2 A ST	1	6ES7132-6FD00-0BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A ST	10	6ES7132-6FD00-2BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A HF	1	6ES7132-6FD00-0CU0	CC20	U0
With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control				
RQ 4 x 24 V UC/2 A CO ST	1	6ES7132-6GD51-0BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6ES7132-6HD01-0BB1	--	B0, B1
RQ 4 x 120 V DC-230 V AC/5 A NO ST	10	6ES7132-6HD01-2BB1	--	B0, B1
RQ MA 4 x 120 V DC ... 230 V AC/5 A NO ST	1	6ES7132-6MD00-0BB1	--	B0, B1

### Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**I/O modules > Digital output modules****Overview**

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
<b>BU type B0</b> • Forwarding of the potential group (dark) • 12 push-in terminals • With 4 AUX terminals	1	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
<b>BU type B0</b> • Forwarding of the potential group (dark) • 12 push-in terminals • With 4 AUX terminals	10	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
<b>BU type B1</b> • Forwarding of the potential group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
<b>BU type B1</b> • Forwarding of the potential group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
<b>BU type U0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC20	--
<b>BU type U0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC20	--
<b>BU type U0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC20	--
<b>BU type U0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC20	--



## Overview

### Overview of potential distributor modules

Potential distributor module	PU	Article No.	CC codes for push-in terminals
<b>PotDis BU</b> Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
<b>PotDis BU</b> Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
<b>PotDis BU</b> Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
<b>PotDis BU</b> Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
<b>PotDis TB</b> Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
<b>PotDis TB</b> Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
<b>PotDis TB</b> Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
<b>PotDis TB</b> Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

10

## Ordering data

### Digital output modules

Type of delivery:  
Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

The number of modules required is the number of modules ordered. The pack type is selected by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.

Digital output module  
DQ 16x24VDC/0.5A Basic,  
BU type A0, color code CC00

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6BH00-0AA0**  
**6ES7132-6BH00-2AA0**

Digital output module  
DQ 16x24VDC/0.5A Standard,  
BU type A0, color code CC00

- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6BH00-2BA0**

Digital output module  
DQ 16x24VDC/0.5A Standard,  
Source output (switching to P  
potential), BU type A0,  
color code CC00

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6BH01-0BA0**  
**6ES7132-6BH01-2BA0**

Digital output module  
DQ 8x24VDC/0.5A Sinking output,  
Basic, BU type A0,  
color code CC01

- Pack of 1 unit

**6ES7132-6BF61-0AA0**

Digital output module  
DQ 8x24VDC/0.5A Basic,  
BU type A0, color code CC02

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6BF01-0AA0**  
**6ES7132-6BF01-2AA0**

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Digital output modules****Ordering data****Article No.****Article No.**

Digital output module  
DQ 8x24VDC/0.5A Standard,  
BU type A0, color code CC02

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6BF01-0BA0**  
**6ES7132-6BF01-2BA0**

Digital output module  
DQ 8x24VDC/0.5A High Feature,  
BU type A0, color code CC02

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6BF00-0CA0**  
**6ES7132-6BF00-2CA0**

Digital output module  
DQ 4x24VDC/2A Standard,  
BU type A0, color code CC02

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6BD20-0BA0**  
**6ES7132-6BD20-2BA0**

Digital output module  
DQ 4x24VDC/2A High Feature,  
BU type A0, color code CC02,  
channel-specific diagnostics,  
isochronous mode, shared output  
(MSO)

- Pack of 1 unit

**6ES7132-6BD20-0CA0**

Digital output module  
DQ 4x24VDC/2A High Speed,  
BU type A0, color code CC02,  
3 operating modes  
(fast isochronous DQ with valve  
control, pulse width modulation,  
oversampling)

- Pack of 1 unit

**6ES7132-6BD20-0DA0**

Digital output module  
DQ 4x24VAC...230VAC/2A  
Standard for BU type B1,  
color code CC41

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6FD00-0BB1**  
**6ES7132-6FD00-2BB1**

Digital output module  
DQ 4x24VAC...230VAC/2A  
High Feature for BU type U0,  
color code CC20,  
2 operating modes: DQ and PC  
(power control via phase angle,  
half-wave and full-wave control)

- Pack of 1 unit

**6ES7132-6FD00-0CU0**

Signal relay module  
RQ CO 4x24VUC/2A Standard,  
changeover contact, BU type A0,  
color code CC00

- Pack of 1 unit

**6ES7132-6GD51-0BA0**

Relay module  
RQ NO 4x120VDC-230VAC/5A  
Standard, NO contact,  
BU type B0, B1

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7132-6HD01-0BB1**  
**6ES7132-6HD01-2BB1**

Relay module  
RQ NO 4x120VDC-230VAC/5A  
Standard, NO contact, with manual  
operation, BU type B0, B1

**6ES7132-6MD00-0BB1**

Relay module  
RQ CO 3x120V DC..230VAC/5A  
Standard, changeover contact,  
floating, BU type U0,  
color code CC20

**6ES7132-6HC50-0BU0**

Relay module  
RQ CO ni 3x120V DC..230VAC/5A  
Standard, changeover contact,  
non-floating, BU type U0,  
color code CC20

**6ES7132-6HC70-0BU0**

**Suitable BaseUnits****BU15-P16+A10+2D**

BU type A0; BaseUnit (light)  
with 16 push-in terminals (1 ... 16)  
to the module and an additional  
10 internally jumpered  
AUX terminals (1 A to 10 A);  
for starting a new potential group  
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units;  
to order a pack, please order this  
article number with an order  
quantity of 10.

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0**

**BU15-P16+A0+2D**

BU type A0; BaseUnit (light)  
with 16 push-in terminals to the  
module; for starting a new potential  
group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units;  
to order a pack, please order this  
article number with an order  
quantity of 10.

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

**2BU15-P16+A0+2DB**

Double BaseUnit  
for holding 2 I/O modules;  
BU type A0; BaseUnit (light/dark)  
with 16 push-in terminals to the  
module; for starting a new potential  
group (max. 10 A)

- Pack of 1 unit

**6ES7193-6BP60-0DA0**

**BU15-P16+A10+2B**

BU type A0; BaseUnit (dark)  
with 16 push-in terminals (1 ... 16)  
to the module and an additional  
10 internally jumpered  
AUX terminals (1 A to 10 A);  
for continuing the potential group

- Pack of 1 unit
- Pack of 10 units;  
to order a pack, please order this  
article number with an order  
quantity of 10.

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0**

**BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with  
16 push-in terminals to the module;  
for continuing the potential group

- Pack of 1 unit
- Pack of 10 units;  
to order a pack, please order this  
article number with an order  
quantity of 10.

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0**

Ordering data	Article No.	Article No.
<b>2BU15-P16+A0+2B</b> Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the potential group • Pack of 1 unit	<b>6ES7193-6BP60-0BA0</b>	
<b>BU20-P12+A4+0B</b> BU type B0; BaseUnit (dark) with 12 push-in terminals (1 ... 12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP20-0BB0</b> <b>6ES7193-6BP20-2BB0</b>	
<b>BU20-P12+A0+4B</b> BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the potential group; PU: 1 unit • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP20-0BB1</b> <b>6ES7193-6BP20-2BB1</b>	
<b>BU20-P16+A0+2D</b> BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP00-0DU0</b> <b>6ES7193-6BP00-2DU0</b>	
<b>BU20-P16+A0+2B</b> BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP00-0BU0</b> <b>6ES7193-6BP00-2BU0</b>	
<b>Potential distributor modules</b>		
<b>PotDis BU</b>		
PotDis BU, Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	<b>6ES7193-6UP00-0DP1</b>	
PotDis BU, Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	<b>6ES7193-6UP00-0BP1</b>	
PotDis BU, Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	<b>6ES7193-6UP00-0DP2</b>	
PotDis BU, Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	<b>6ES7193-6UP00-0BP2</b>	
		<b>PotDis TB</b>
		PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)
		<b>6ES7193-6TP00-0TP0</b>
		PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)
		<b>6ES7193-6TP00-0TP1</b>
		PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)
		<b>6ES7193-6TP00-0TP2</b>
		PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX
		<b>6ES7193-6TP00-0TN0</b>
		<b>Accessories</b>
		<b>Equipment labeling plate</b>
		<b>6ES7193-6LF30-0AW0</b>
		10 sheets of 16 labels, for printing with thermal transfer card printer or plotter
		<b>Labeling strips</b>
		500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer
		<b>6ES7193-6LR10-0AA0</b>
		500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer
		<b>6ES7193-6LR10-0AG0</b>
		1 000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer
		<b>6ES7193-6LA10-0AA0</b>
		1 000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer
		<b>6ES7193-6LA10-0AG0</b>
		<b>BU cover</b>
		For covering empty slots (gaps); 5 units
		• 15 mm wide
		<b>6ES7133-6CV15-1AM0</b>
		• 20 mm wide
		<b>6ES7133-6CV20-1AM0</b>
		<b>Shield connection</b>
		<b>6ES7193-6SC00-1AM0</b>
		5 shield supports and 5 shield terminals
		<b>Color-coded labels for 15 mm-wide BaseUnits</b>
		Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units
		<b>6ES7193-6CP00-2MA0</b>
		Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units
		<b>6ES7193-6CP01-2MA0</b>
		Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units
		<b>6ES7193-6CP01-4MA0</b>
		Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units
		<b>6ES7193-6CP02-2MA0</b>
		Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units
		<b>6ES7193-6CP02-4MA0</b>
		Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units
		<b>6ES7193-6CP71-2AA0</b>
		Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units
		<b>6ES7193-6CP72-2AA0</b>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Digital output modules**

Ordering data	Article No.	Article No.
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP73-2AA0</b>	<b>Color-coded labels for PotDis TB</b>
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	<b>6ES7193-6CP73-4AA0</b>	Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units
<b>Color-coded labels for 20 mm-wide BaseUnits</b>		Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units
Color code CC41, for 16 push-in terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	<b>6ES7193-6CP41-2MB0</b>	Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units
Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A); 10 units	<b>6ES7193-6CP81-2AB0</b>	Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units
Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units	<b>6ES7193-6CP82-2AB0</b>	<b>Mechanical coding elements</b>
Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units	<b>6ES7193-6CP83-2AB0</b>	For automatic coding of I/O modules; spare part. 20 units
<b>Color-coded labels for PotDis BU</b>		Type A
Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	<b>6ES7193-6CP62-2MA0</b>	Type B
Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	<b>6ES7193-6CP63-2MA0</b>	Type C
		Type D
		<b>6ES7193-6KA00-3AA0</b>
		<b>6ES7193-6KB00-3AA0</b>
		<b>6ES7193-6KC00-3AA0</b>
		<b>6ES7193-6KD00-3AA0</b>

**Technical specifications**

Article number	<b>6ES7132-6BF61-0AA0</b>	<b>6ES7132-6BH00-0AA0</b>	<b>6ES7132-6BF01-0AA0</b>	<b>6ES7132-6BH01-0BA0</b>	<b>6ES7132-6BF01-0BA0</b>
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16x24VDC/0,5A BA, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1
<b>General information</b>					
Product type designation	DQ 8x24VDC/0,5A SNK BA	DQ 16x24VDC/0.5A BA	DQ 8x24VDC/0.5A BA	DQ 16x24VDC/0.5A ST	DQ 8x24VDC/0.5A ST
<b>Product function</b>					
• Isochronous mode	No	No	No	No	No
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/integrated from version	V14	V14	V14	V14	V14
• STEP 7 configurable/integrated from version	V5.5 SP3	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3 or higher
• PCS 7 configurable/integrated from version				V8.1 SP1	V8.1 SP1
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
<b>Operating mode</b>					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No	No
• PWM	No	No	No	No	No
• Oversampling	No	No	No	No	No
• MSO	No	No	No	No	No

**Technical specifications**

Article number	6ES7132-6BF61-0AA0	6ES7132-6BH00-0AA0	6ES7132-6BF01-0AA0	6ES7132-6BH01-0BA0	6ES7132-6BF01-0BA0
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16x24VDC/0,5A BA, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1
<b>Supply voltage</b>					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection		Yes	Yes	Yes	Yes
<b>Digital outputs</b>					
Type of digital output	Sink output (NPN)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)
Number of digital outputs	8	16	8	16	8
Current-sinking	Yes	No		No	
Current-sourcing		Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes; per channel, elec- tronic	Yes	Yes
Open-circuit detection		No		Yes	
Limitation of inductive shutdown voltage to	Typ. 47 V	Typ. L+ (-53 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>					
• with resistive load, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W	5 W	5 W	5 W
<b>Load resistance range</b>					
• lower limit	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω
• upper limit	3 400 Ω	100 kΩ	100 kΩ	12 kΩ	12 kΩ
<b>Output voltage</b>					
• for signal "1", min.					L+ (-0.8 V)
<b>Output current</b>					
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	5 μA	30 μA	10 μA	0.1 mA	0.1 mA
<b>Output delay with resistive load</b>					
• "0" to "1", typ.		80 μs; at rated load		50 μs	
• "0" to "1", max.	300 μs	150 μs; at rated load	100 μs; at rated load		50 μs; at rated load
• "1" to "0", typ.		100 μs; at rated load		100 μs	
• "1" to "0", max.	600 μs	200 μs; at rated load	150 μs; at rated load		100 μs; at rated load
<b>Parallel switching of two outputs</b>					
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
<b>Switching frequency</b>					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	2 Hz	2 Hz	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
<b>Total current of the outputs</b>					
• Current per channel, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• Current per module, max.	4 A	8 A	4 A	8 A	4 A
<b>Total current of the outputs (per module)</b>					
<b>horizontal installation</b>					
- up to 40 °C, max.				8 A	
- up to 50 °C, max.				6 A	
- up to 60 °C, max.	4 A	8 A	4 A	4 A	4 A
<b>vertical installation</b>					
- up to 30 °C, max.				8 A	
- up to 40 °C, max.				6 A	
- up to 50 °C, max.	4 A	8 A	4 A	4 A	4 A
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m	600 m

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**I/O modules > Digital output modules****Technical specifications**

Article number	<b>6ES7132-6BF61-0AA0</b>	<b>6ES7132-6BH00-0AA0</b>	<b>6ES7132-6BF01-0AA0</b>	<b>6ES7132-6BH01-0BA0</b>	<b>6ES7132-6BF01-0BA0</b>
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16x24VDC/0,5A BA, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1
<b>Interrupts/diagnostics/ status information</b>					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
<b>Diagnoses</b>					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break	No	No	No	Yes; Module-wise	Yes; Module-wise
• Short-circuit	No	No	No		
• Short-circuit to M				Yes; Module-wise	Yes; Module-wise
• Short-circuit to L+				Yes; Module-wise	Yes; Module-wise
• Group error	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>					
<b>Potential separation channels</b>					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-related tripping of standard modules		No	Yes; From FS01	Yes; From FS01	Yes; From FS01
<b>Highest safety class achievable in safety mode</b>					
• Performance level according to ISO 13849-1			PL d	PL d	PL d
• SIL acc. to IEC 61508			SIL 2	SIL 2	SIL 2
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-25 °C	-30 °C	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-25 °C	-30 °C	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>					
Weight, approx.	30 g	30 g	30 g	30 g	30 g

### Technical specifications

Article number	6ES7132-6BF00-0CA0	6ES7132-6BD20-0BA0	6ES7132-6BD20-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	ET 200SP, DQ 4x24VDC/2A ST	ET 200SP, DQ 4x24VDC/2A HF	ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	ET 200SP, DQ 4x24...230VAC/2A ST
General information					
Product type designation	DQ 8x24 V DC/0.5 A HF	DQ 4x24 V DC/2 A ST	DQ 4x DC 24 V/2 A HF	DQ 4x24 V DC/2 A HS	DQ 4x24 ... 230 V AC/2 A ST
Product function					
• Isochronous mode	Yes	No	Yes	Yes; Operating modes DQ and OVS only	No
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 / -	V11 SP2 / V13	V13 SP1 / -	STEP 7 V15.1 or higher	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 / -	V5.5 SP3 / -	V5.5 / -	via GSD as of V5.6 HF4	V5.5 SP3 / - HF4
• PCS 7 configurable/integrated from version	V8.1 SP1	V8.1 SP1			
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.33	GSDML V2.3
Operating mode					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	Yes; Valve control	No
• PWM	No	No	No	Yes	No
• Cam control (switching at comparison values)				Yes; Via MtM (module-to-module communication)	
• Oversampling	No	No	No	Yes	No
• MSO	Yes	No	Yes	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	
Rated value (AC)					230 V
Reverse polarity protection	Yes	Yes	Yes	Yes	
Digital outputs					
Type of digital output	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Triac with zero point detection
Number of digital outputs	8	4	4	4	4
Current-sinking	No	No	No	No	No
Current-sourcing	Yes	Yes	Yes	Yes; Push-pull output	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	No
Short-circuit protection	Yes	Yes	Yes	Yes	No; When using BU type B1, a miniature, quick-response fuse with 10 A tripping current must be provided
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)	L+ (-37 to 41V)	M (-1 V)	
Controlling a digital input	Yes	Yes	Yes; Minimum current consumption 7 mA	No	Yes
Digital output functions, parameterizable					
• Switching tripped by comparison values				Yes	
- Number of cam tracks, max.				4	
• Freely usable digital output				Yes	
• PWM output				Yes	
- Number, max.				4	
• Digital output with oversampling				Yes	
- Number, max.				4	
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	2 A	2 A	2 A	2 A
• on lamp load, max.	5 W	10 W	10 W	10 W	100 W
Load resistance range					
• lower limit	48 Ω	12 Ω	12 Ω	12 Ω	
• upper limit	12 kΩ	3 400 Ω	3 400 Ω	3 400 Ω	

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Digital output modules****Technical specifications**

Article number	<b>6ES7132-6BF00-0CA0</b> ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	<b>6ES7132-6BD20-0BA0</b> ET 200SP, DQ 4x24VDC/2A ST	<b>6ES7132-6BD20-0CA0</b> ET 200SP, DQ 4x24VDC/2A HF	<b>6ES7132-6BD20-0DA0</b> ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	<b>6ES7132-6FD00-0BB1</b> ET 200SP, DQ 4x24VDC/2A ST
<b>Output voltage</b> • for signal "1", min.					20.4 V
<b>Output current</b> • for signal "1" rated value • for signal "0" residual current, max.	0.5 A 0.1 mA	2 A 0.1 mA	2 A 0.1 mA	2 A 0.1 mA	2 A 460 µA
<b>Output delay with resistive load</b> • "0" to "1", typ. • "0" to "1", max. • "1" to "0", typ. • "1" to "0", max.	50 µs 100 µs	50 µs 100 µs	50 µs 100 µs	1 µs 1 µs	10 ms 10 ms
<b>Parallel switching of two outputs</b> • for logic links • for uprating • for redundant control of a load	No Yes	No Yes	No	No	No No Yes
<b>Switching frequency</b> • with resistive load, max. • with inductive load, max.  • on lamp load, max.	100 Hz 2 Hz  10 Hz	100 Hz 2 Hz  10 Hz	100 Hz 2 Hz  10 Hz	5 kHz 5 kHz  5 kHz	10 Hz 0.5 Hz; Higher frequencies are possible, see Equipment Manual / Product Information  1 Hz
<b>Total current of the outputs</b> • Current per channel, max. • Current per module, max.	0.5 A 4 A	2 A 8 A	2 A 8 A	2 A 8 A	2 A 8 A
<b>Total current of the outputs (per module)</b> <b>horizontal installation</b> - up to 30 °C, max. - up to 40 °C, max. - up to 50 °C, max. - up to 60 °C, max. <b>vertical installation</b> - up to 30 °C, max. - up to 40 °C, max. - up to 50 °C, max. - up to 60 °C, max.	4 A	8 A 6 A 4 A	8 A 6 A 4 A	8 A; DQ mode 6.9 A; DQ mode 4.7 A; DQ mode 2.5 A; DQ mode  7.2 A; DQ mode 5.6 A; DQ mode 4 A; DQ mode	8 A 6 A 4 A  8 A 6 A 4 A
<b>Cable length</b> • shielded, max. • unshielded, max.	1 000 m 600 m	1 000 m 600 m	1 000 m 600 m	50 m 50 m	1 000 m 600 m
<b>Isochronous mode</b> Execution and activation time (TCO), min. Bus cycle time (TDP), min.	48 µs 500 µs		500 µs	40 µs 125 µs	
<b>Interrupts/diagnostics/status information</b> Diagnostics function Substitute values connectable	Yes Yes	Yes Yes	Yes Yes	Yes Yes	No Yes
<b>Alarms</b> • Diagnostic alarm	Yes	Yes	Yes	Yes	No
<b>Diagnoses</b> • Diagnostic information readable • Monitoring the supply voltage • Wire-break  • Short-circuit • Group error	Yes Yes; channel by channel Yes; channel by channel Yes	Yes Yes; Module-wise Yes; Module-wise Yes	Yes Yes; channel by channel Yes; channel by channel Yes	Yes Yes No Yes; Module-wise Yes	No No No No Yes



**Technical specifications**

Article number	6ES7132-6BF00-0CA0	6ES7132-6BD20-0BA0	6ES7132-6BD20-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	ET 200SP, DQ 4x24VDC/2A ST	ET 200SP, DQ 4x24VDC/2A HF	ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	ET 200SP, DQ 4x24VDC/2A ST
<b>Diagnostics indication LED</b>					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	No	Yes; red LED	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>					
<b>Potential separation channels</b>					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS03	Yes; From FS02	No	
<b>Highest safety class achievable in safety mode</b>					
• Performance level according to ISO 13849-1	PL d	PL d	PL d		
• SIL acc. to IEC 61508	SIL 2	SIL 2	SIL 2		
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS08	-30 °C; < 0 °C as of FS06	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS08	-30 °C; < 0 °C as of FS06	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	60 °C
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m; On request: Installation altitudes greater than 2 000 m
<b>Dimensions</b>					
Width	15 mm	15 mm	15 mm	15 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>					
Weight, approx.	30 g	30 g	30 g	31 g	50 g
Article number	6ES7132-6FD00-0CU0	6ES7132-6GD51-0BA0	6ES7132-6HD01-0BB1	6ES7132-6MD00-0BB1	
	ET 200SP, DQ 4x24VDC/2A HF, PU 1	ET 200SP, RQ CO 4x 24V DC/2A ST, VPE 1	ET 200SP, RQ NO 4x 120VDC...230VAC/5A, PU1	ET 200SP,RQ NO-mA 4x120VDC...230VAC/5A ST	
<b>General information</b>					
Product type designation	DQ 4x24 ... 230 V AC/2 A HF	RQ CO 4x24VDC/2A ST	RQ 4x120 VDC ... 230 VAC/ 5 A NO ST	RQ 4x120 V DC ... 230 V AC/5 A NO MA ST	
<b>Product function</b>					
• Isochronous mode	No	No	No		
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/integrated from version	V14	V14	V14	V13 SP1	
• STEP 7 configurable/integrated from version	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3 / -	
• PCS 7 configurable/integrated from version			V8.1 SP1		
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Digital output modules****Technical specifications**

Article number	<b>6ES7132-6FD00-0CU0</b>	<b>6ES7132-6GD51-0BA0</b>	<b>6ES7132-6HD01-0BB1</b>	<b>6ES7132-6MD00-0BB1</b>
	ET 200SP, DQ 4x24...230VAC/2A HF, PU 1	ET 200SP, RQ CO 4x 24V DC/2A ST, VPE 1	ET 200SP, RQ NO 4x 120VDC..230VAC/5A, PU1	ET 200SP,RQ NO-mA 4x120VDC..230VAC/5A ST
<b>Operating mode</b>				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	Yes	No	No	No
• PWM	No	No	No	No
• Oversampling	No	No	No	No
• MSO	No	No	No	No
• Phase control	Yes; Control area: 8.5 ... 100% of the phase angle			
• Trailing-edge phase	No			
• Half-wave	Yes			
• Full-wave	Yes			
<b>Supply voltage</b>				
Rated value (DC)		24 V	24 V	24 V
Rated value (AC)	230 V; 47 ... 63 Hz, max. rate of change of frequency 1 mHz/s			
Reverse polarity protection		Yes	Yes	Yes
<b>Digital outputs</b>				
Type of digital output		Relays	Relays	Relays
Number of digital outputs	4	4	4	4
Current-sinking	No	Yes	Yes	
Current-sourcing	Yes	Yes	Yes	
Digital outputs, parameterizable	Yes	Yes	Yes	
Short-circuit protection	No; external fusing necessary	No	No	No
Open-circuit detection	Yes; channel by channel			
Overload protection	No; A miniature fuse with 10 tripping current and tripping characteristic "quick response" must be provided in the module supply			
Controlling a digital input	Yes			
<b>Switching capacity of the outputs</b>				
• with resistive load, max.	2 A; Max. 4 A, see additional description in manual			
• with inductive load, max.	2 A			
• on lamp load, max.	100 W; Tungsten rating in accordance with UL; for thermistors with higher power ratings, see the notes in the manual			
<b>Output voltage</b>				
• for signal "1", min.	20.4 V			
<b>Output current</b>				
• for signal "1" rated value	2 A			
• for signal "0" residual current, max.	3 mA			
<b>Output delay with resistive load</b>				
• "0" to "1", max.	40 ms; 2 AC cycles			
• "1" to "0", max.	20 ms; 1 AC cycle			
<b>Parallel switching of two outputs</b>				
• for logic links	No	Yes	Yes	
• for uprating	No	No	No	
• for redundant control of a load	Yes	Yes	Yes	

**Technical specifications**

Article number	<b>6ES7132-6FD00-0CU0</b> ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	<b>6ES7132-6GD51-0BA0</b> ET 200SP, RQ CO 4x 24V DC/2A ST, VPE 1	<b>6ES7132-6HD01-0BB1</b> ET 200SP, RQ NO 4x 120VDC..230VAC/5A, PU1	<b>6ES7132-6MD00-0BB1</b> ET 200SP,RQ NO-mA 4x120VDC..230VAC/5A ST
<b>Switching frequency</b>				
• with resistive load, max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode	2 Hz	2 Hz	2 Hz
• with inductive load, max.			0.5 Hz	0.5 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode			
• on lamp load, max.	1 Hz; Applies to DQ mode; limited by line frequency in PC mode		2 Hz	2 Hz
<b>Total current of the outputs</b>				
• Current per channel, max.	2 A; Max. 4 A, see additional description in manual	2 A	5 A	5 A
• Current per module, max.	8 A	8 A	20 A	20 A
<b>Total current of the outputs (per module)</b>				
<b>horizontal installation</b>				
- up to 40 °C, max.	8 A	8 A		
- up to 50 °C, max.	6 A	6 A	20 A	20 A
- up to 60 °C, max.	4 A	4 A	16 A	16 A
<b>vertical installation</b>				
- up to 30 °C, max.	8 A	8 A		
- up to 40 °C, max.	6 A	6 A	20 A	20 A
- up to 50 °C, max.	4 A	4 A	16 A	16 A
<b>Relay outputs</b>				
• Number of relay outputs		4	4	4
• Rated supply voltage of relay coil L+ (DC)		24 V	24 V	24 V
• Current consumption of relays (coil current of all relays), max.		40 mA	40 mA	40 mA
• external protection for relay outputs			Yes, with miniature fuse max. 6 A tripping current and quick-response tripping characteristic	Yes, with miniature fuse max. 6 A tripping current and quick-response tripping characteristic
• Number of operating cycles, max.			7 000 000; see additional description in the manual	7 000 000; see additional description in the manual
<b>Switching capacity of contacts</b>				
- with inductive load, max.			2 A; see additional description in the manual	2 A; see additional description in the manual
- with resistive load, max.		2 A	5 A; see additional description in the manual	5 A; see additional description in the manual
- Thermal continuous current, max.		2 A	5 A; Max. 1 385 VA, 150 W	5 A
- Switching current, min.		1 mA; 5 V DC	100 mA; 5 V DC	100 mA; 5 V DC
- Rated switching voltage (DC)		24 V	24 V DC to 120 V DC	24 V DC to 120 V DC
- Rated switching voltage (AC)		24 V	24V AC to 230V AC	24V AC to 230V AC
<b>Cable length</b>				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	200 m	200 m	200 m
<b>Interrupts/diagnostics/ status information</b>				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	Yes

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Digital output modules

#### Technical specifications

Article number	6ES7132-6FD00-0CU0	6ES7132-6GD51-0BA0	6ES7132-6HD01-0BB1	6ES7132-6MD00-0BB1
	ET 200SP, DQ 4x24...230VAC/2A HF, PU 1	ET 200SP, RQ CO 4x 24V DC/2A ST, VPE 1	ET 200SP, RQ NO 4x 120VDC..230VAC/5A, PU1	ET 200SP,RQ NO-mA 4x120VDC..230VAC/5A ST
<b>Diagnoses</b>				
• Diagnostic information readable	Yes			
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	No	No	No
• Short-circuit	No	No	No	No
• Group error	Yes			Yes
<b>Diagnoses indication LED</b>				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red Fn LED	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>				
<b>Potential separation channels</b>				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
Suitable for safety functions	No	No	No	No
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
<b>Dimensions</b>				
Width	20 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>				
Weight, approx.	50 g	30 g	40 g	45 g
Article number	6ES7132-6HC50-0BU0		6ES7132-6HC70-0BU0	
	ET 200SP, RQ CO 3x120VDC..230VAC/5A ST		ET 200SP, RQ CO ni 3x120VDC..230VAC/5A ST	
<b>General information</b>				
Product type designation	RQ 3x120VDC-230VAC/5A CO ST		RQ 3x120VDC-230VAC/5A CO n.i. ST	
<b>Product function</b>				
• Isochronous mode	No		No	
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher			
• STEP 7 configurable/integrated from version	Configurable via GSD file			
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher			
<b>Supply voltage</b>				
Rated value (DC)	24 V		24 V	
Reverse polarity protection	Yes		Yes	

#### Technical specifications

Article number	<b>6ES7132-6HC50-0BU0</b> ET 200SP, RQ CO 3x120VDC.230VAC/5A ST	<b>6ES7132-6HC70-0BU0</b> ET 200SP, RQ COni 3x120VDC.230VAC/5A ST
<b>Digital outputs</b>		
Type of digital output	Relays	Relays
Number of digital outputs	3	3
Current-sinking	Yes	Yes
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	No	No
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	5 A; see additional description in the manual	5 A; see additional description in the manual
• with inductive load, max.	2 A; see additional description in the manual	2 A; see additional description in the manual
<b>Parallel switching of two outputs</b>		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	2 Hz	2 Hz
<b>Total current of the outputs</b>		
• Current per channel, max.	5 A	5 A
• Current per module, max.	15 A	5 A
<b>Total current of the outputs (per module)</b>		
<b>horizontal installation</b>		
- up to 50 °C, max.	15 A	5 A
- up to 60 °C, max.	12 A; maximum channel current 4A	5 A
<b>vertical installation</b>		
- up to 40 °C, max.	15 A	5 A
- up to 50 °C, max.	12 A; maximum channel current 4A	5 A
<b>Relay outputs</b>		
• Number of relay outputs	3; changeover contact, isolated	3; Changeover contact, non-floating
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V
• Current consumption of relays (coil current of all relays), max.	30 mA	40 mA
• external protection for relay outputs	yes, with miniature fuse max. 6.3 A tripping current, quick-response tripping characteristic and 1 500 A breaking capacity	yes, with miniature fuse max. 6.3 A tripping current, quick-response tripping characteristic and 1 500 A breaking capacity
• Number of operating cycles, max.	1 000 000; see additional description in the manual	1 000 000; see additional description in the manual
<b>Switching capacity of contacts</b>		
- with inductive load, max.	2 A; see additional description in the manual	2 A; see additional description in the manual
- with resistive load, max.	5 A; see additional description in the manual	5 A; see additional description in the manual
- Thermal continuous current, max.	5 A; Max. 1 385 VA, 150 W	5 A; Max. 1 385 VA, 150 W
- Switching current, min.	10 mA; 5 V DC	10 mA; 5 V DC
- Rated switching voltage (DC)	24 V DC to 120 V DC	24 V DC to 120 V DC
- Rated switching voltage (AC)	24V AC to 230V AC	24V AC to 230V AC
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	200 m	200 m
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**I/O modules > Digital output modules****Technical specifications**

Article number	<b>6ES7132-6HC50-0BU0</b> ET 200SP, RQ CO 3x120VDC.230VAC/5A ST	<b>6ES7132-6HC70-0BU0</b> ET 200SP, RQ CO ni 3x120VDC.230VAC/5A ST
<b>Diagnoses</b>		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	No	No
• Short-circuit	No	No
<b>Diagnostics indication LED</b>		
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Standards, approvals, certificates</b>		
Suitable for safety functions	No	No
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
<b>Dimensions</b>		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
<b>Weights</b>		
Weight, approx.	40 g	40 g

## Overview

Energy Meter HF module  
for SIMATIC ET 200SP

Energy Meter HF module for SIMATIC ET 200SP video  
[https://players.brightcove.net/1813624294001/70fec0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=5848889024001](https://players.brightcove.net/1813624294001/70fec0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=5848889024001)



- 2, 4 and 8-channel analog input (AI) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Basic, Standard, High Feature and High Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting current, voltage and resistance sensors, as well as thermocouples
- Option of connecting force and torque sensors

- Energy Meter for recording up to 600 electrical variables
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other PLCs)
  - Oversampling operating mode (n-fold equidistant acquisition of analog values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Isochronous mode (simultaneous equidistant reading in of all analog values)
  - Scalable measuring range (adaptation of measuring range, increase of the 16-bit resolution by adapting the measuring range to a limited section)
  - Scaling of the measured values (transmission of the analog value normalized to the required physical value as a 32-bit floating point value)
  - Internal compensation of the line resistance for thermocouples by means of terminal temperature measurement in the BaseUnit for BU type A1
  - Internal compensation also for 2-conductor resistance measurement by means of adjustable line resistance
  - Calibration during runtime
  - Single-channel galvanic isolation
  - HART communication
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break, short-circuit, overflow, underflow
  - Two upper and lower hardware interrupts in each case, interference frequency suppression, smoothing
  - Value status (optional binary validity information of the analog value status in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the AI modules is offered by the TIA Selection Tool.

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Analog input modules****Overview**

Overview of analog input modules

Analog input	PU	Article No.	CC code	BU type
AI 8 x I 2/4-wire BA	1	6ES7134-6GF00-0AA1	CC01	A0, A1
AI 2 x U ST	1	6ES7134-6FB00-0BA1	CC00	A0, A1
AI 8 x U BA	1	6ES7134-6FF00-0AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6ES7134-6HD00-0BA1	CC03	A0, A1
AI 4 x U/I 2-wire ST	10	6ES7134-6HD00-2BA1	CC03	A0, A1
AI 2 x I 2/4-wire ST	1	6ES7134-6GB00-0BA1	CC05	A0, A1
AI 4 x I 2/4-wire ST	1	6ES7134-6GD00-0BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	10	6ES7134-6GD00-2BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6ES7134-6TD00-0CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6ES7134-6HB00-0CA1	CC05	A0, A1
AI 2 x U/I 2/4-wire HS	1	6ES7134-6HB00-0DA1	CC00	A0, A1
With two operating modes: • High-speed isochronous AI • Oversampling				
AI 8 x RTD/TC 2-wire HF	1	6ES7134-6JF00-0CA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	10	6ES7134-6JF00-2CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	1	6ES7134-6JD00-0CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	10	6ES7134-6JD00-2CA1	CC00	A0, A1
AI 4 x TC High Speed	1	6ES7134-6JD00-0DA1	CC00	A0, A1
AI 2 x SG 4/6-wire High Speed	1	7MH4134-6LB00-0DA0	CC00	A0
AI Energy Meter 400 V AC ST	1	6ES7134-6PA01-0BU0	--	D0
AI Energy Meter 480 V AC ST	1	6ES7134-6PA21-0BU0	--	D0
AI Energy Meter 480 V AC/CT High Feature	1	6ES7134-6PA01-0CU0	--	U0
AI Energy Meter 480 V AC/RT High Feature	1	6ES7134-6PA21-0CU0	--	U0

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--



**Overview**

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
<b>BU type A1</b> • New potential group (light) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
<b>BU type A1</b> • New potential group (light) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
<b>BU type A1</b> • Forwarding of the potential group (dark) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
<b>BU type A1</b> • Forwarding of the potential group (dark) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--
<b>BU type D0</b> • Forwarding of the potential group (dark) • 12 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BD0	--	--
<b>BU type U0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
<b>BU type U0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
<b>BU type U0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
<b>BU type U0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

Overview of potential distributor modules

Potential distributor module	PU	Article No.	CC codes for push-in terminals
<b>PotDis BU</b> Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
<b>PotDis BU</b> Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
<b>PotDis BU</b> Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Analog input modules****Overview**

Potential distributor module	PU	Article No.	CC codes for push-in terminals
<b>PotDis BU</b> Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
<b>PotDis TB</b> Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
<b>PotDis TB</b> Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
<b>PotDis TB</b> Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
<b>PotDis TB</b> Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

**Ordering data****Article No.****Article No.****Analog input modules**

Type of delivery:  
Apart from the standard type of delivery in a single-unit package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

The number of modules required is the number of modules ordered. The pack type is selected by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.

Analog input module  
AI 8xI 2/4-wire BA, BU type A0 or A1, color code CC01

**6ES7 134-6GF00-0AA1**

Analog input module  
AI 2xU ST, BU type A0 or A1, color code CC00

**6ES7134-6FB00-0BA1**

Analog input module  
AI 8xU BA, BU type A0 or A1, color code CC02

**6ES7 134-6FF00-0AA1**

Analog input module  
AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7134-6HD01-0BA1**  
**6ES7134-6HD01-2BA1**

Analog input module  
AI 2xI 2/4-wire Standard, BU type A0 or A1, color code CC05, 16-bit

- Pack of 1 unit

**6ES7134-6GB00-0BA1**

Analog input module  
AI 4xI 2/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7134-6GD01-0BA1**  
**6ES7134-6GD01-2BA1**

Analog input module  
AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03

**6ES7134-6TD00-0CA1**

Analog input module  
AI 2xU/I 2/4-wire High Feature, BU type A0 or A1, color code CC05, 16-bit, ±0.1%, independent channel galvanic isolation, isochronous mode above 1 ms

**6ES7134-6HB00-0CA1**

Analog input module  
AI 2xU/I 2/4-wire High Speed, BU type A0 or A1, color code CC00, 16-bit, ±0.3%, isochronous mode above 250 µs, oversampling above 50 µs

**6ES7134-6HB00-0DA1**

Analog input module  
AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7134-6JF00-0CA1**  
**6ES7134-6JF00-2CA1**

Analog input module  
AI 4xRTD/TC 2/3/4-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7134-6JD00-0CA1**  
**6ES7134-6JD00-2CA1**

10

Ordering data	Article No.	Article No.
Analog input module AI 4xTC High Speed, BU type A0 or A1, color code CC00, 16-bit, channel diagnostics	<b>6ES7134-6JD00-0DA1</b>	<b>BU15-P16+A0+2B</b> BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group • Pack of 1 unit
Analog input module AI 2x SG, 4/6-wire High Speed, BU type A0, color code CC00, channel diagnostics, 28/16-bit, ±0.05%, for DMS full bridges; for connecting force and torque sensors	<b>7MH4134-6LB00-0DA0</b>	• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10. <b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>
Analog input module AI Energy Meter Standard, 400 V AC, BU type D0	<b>6ES7134-6PA01-0BU0</b>	<b>2BU15-P16+A0+2B</b> Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the potential group • Pack of 1 unit
Analog input module AI Energy Meter Standard, 480 V AC, BU type D0	<b>6ES7134-6PA21-0BU0</b>	<b>6ES7193-6BP60-0BA0</b>
Analog input module AI Energy Meter 480 V AC/CT High Feature, for 1 A or 5 A current transformers, with line analysis functions, channel diagnostics; BU type U0	<b>6ES7134-6PA01-0CU0</b>	<b>Usable type A1 BaseUnits (temperature detection)</b>
Analog input module AI Energy Meter 480 V AC/RT High Feature, for Rogowski coils or 333 mV current/voltage transformers, with line analysis functions, channel diagnostics; BU type U0	<b>6ES7134-6PA21-0CU0</b>	<b>BU15-P16+A0+12D/T</b> BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new potential group (max. 10 A)
<b>Usable type A0 BaseUnits</b>		<b>BU15-P16+A0+2D/T</b> BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A)
<b>BU15-P16+A10+2D</b> BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP20-0DA0</b> <b>6ES7193-6BP20-2DA0</b>	<b>6ES7193-6BP00-0DA1</b>
<b>BU15-P16+A0+2D</b> BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP00-2DA0</b>	<b>BU15-P16+A0+12B/T</b> BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the potential group
<b>2BU15-P16+A0+2DB</b> Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit	<b>6ES7193-6BP60-0DA0</b>	<b>BU15-P16+A0+2B/T</b> BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group
<b>BU15-P16+A10+2B</b> BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP20-0BA0</b> <b>6ES7193-6BP20-2BA0</b>	<b>Usable type D0 BaseUnits</b>
		<b>BU20-P12+A0+0B</b> BU type D0; BaseUnit with 12 push-in terminals, without AUX terminals, bridged to the left
		<b>Suitable type U0 BaseUnits</b>
		<b>BU20-P16+A0+2D</b> BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.
		<b>6ES7193-6BP00-0DU0</b> <b>6ES7193-6BP00-2DU0</b>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Analog input modules****Ordering data****Article No.****BU20-P16+A0+2B**

BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0BU0****6ES7193-6BP00-2BU0****Potential distributor modules****PotDis BU**

PotDis BU, Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)

**6ES7193-6UP00-ODP1**

PotDis BU, Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group

**6ES7193-6UP00-OBP1**

PotDis BU, Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)

**6ES7193-6UP00-ODP2**

PotDis BU, Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group

**6ES7193-6UP00-OBP2****PotDis TB**

PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)

**6ES7193-6TP00-0TP0**

PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)

**6ES7193-6TP00-0TP1**

PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)

**6ES7193-6TP00-0TP2**

PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX

**6ES7193-6TP00-0TN0****Accessories****Equipment labeling plate**

10 sheets of 16 labels, for printing with thermal transfer card printer or plotter

**6ES7193-6LF30-0AW0****Labeling strips**

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AG0**

1 000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer

**6ES7193-6LA10-0AA0**

1 000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer

**6ES7193-6LA10-0AG0****BU cover**

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

**6ES7133-6CV15-1AM0****6ES7133-6CV20-1AM0****Shield connection**

5 shield supports and 5 shield terminals

**6ES7193-6SC00-1AM0****Color-coded labels**

Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units

**6ES7193-6CP00-2MA0**

Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units

**6ES7193-6CP01-2MA0**

Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units

**6ES7193-6CP01-4MA0**

Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units

**6ES7193-6CP02-2MA0**

Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units

**6ES7193-6CP02-4MA0**

Color code CC03, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16); 10 units

**6ES7193-6CP03-2MA0**

Color code CC05, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16); 10 units

**6ES7193-6CP05-2MA0**

Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units

**6ES7193-6CP71-2AA0**

Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units

**6ES7193-6CP72-2AA0**

Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units

**6ES7193-6CP73-2AA0**

Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units

**6ES7193-6CP74-2AA0****Color-coded labels for PotDis BU**

Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units

**6ES7193-6CP62-2MA0**

Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units

**6ES7193-6CP63-2MA0****Color-coded labels for PotDis TB**

Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units

**6ES7193-6CP10-2MT0**

Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units

**6ES7193-6CP11-2MT0**

**Ordering data**

Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units

Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units

**Article No.****6ES7193-6CP12-2MT0****6ES7193-6CP13-2MT0****Article No.****Mechanical coding elements**

For automatic coding of I/O modules; spare part. 20 units

Type A

Type B

Type C

Type D

**6ES7193-6KA00-3AA0****6ES7193-6KB00-3AA0****6ES7193-6KC00-3AA0****6ES7193-6KD00-3AA0****Technical specifications**

Article number	<b>6ES7134-6GF00-0AA1</b> ET 200SP, AI 8xI 2-/4-Wire Basic	<b>6ES7134-6FB00-0BA1</b> ET 200SP, AI 2xU Standard, PU 1	<b>6ES7134-6FF00-0AA1</b> ET 200SP, AI 8xU Basic	<b>6ES7134-6HD01-0BA1</b> ET 200SP, AI 4xU/I 2-Wire ST, PU 1	<b>6ES7134-6GB00-0BA1</b> ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
<b>General information</b>					
Product type designation	AI 8xI 2-/4-wire BA	AI 2xU ST	AI 8xU BA	AI 4x U/I 2-wire	AI 2xI 2-/4-wire ST
<b>Product function</b>					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	No	No	No
• Measuring range scalable	No	No	No	No	No
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1	V13 SP1	V13 SP1	V14 / -	V13 SP1
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.6 and higher	V5.5 SP3
• PCS 7 configurable/integrated from version				V8.1 SP1	
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	V2.3 / -
<b>Operating mode</b>					
• Oversampling	No	No	No	No	No
• MSI	No	No	No	No	No
<b>Supply voltage</b>					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
<b>Analog inputs</b>					
Number of analog inputs	8; Single-ended	2	8; Single-ended	4; Differential inputs	2
• For current measurement	8				2
• For voltage measurement		2	8		
permissible input voltage for voltage input (destruction limit), max.		30 V	30 V	30 V	
permissible input current for current input (destruction limit), max.	50 mA			50 mA	50 mA
Cycle time (all channels), min.	1 ms; per channel	500 µs	1 ms; per channel	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	500 µs
<b>Input ranges (rated values), voltages</b>					
• 0 to +10 V		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	
• 1 V to 5 V		Yes; 15 bit		Yes; 15 bit	
• -10 V to +10 V		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• -5 V to +5 V		Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Analog input modules

#### Technical specifications

Article number	6ES7134-6GF00-0AA1	6ES7134-6FB00-0BA1	6ES7134-6FF00-0AA1	6ES7134-6HD01-0BA1	6ES7134-6GB00-0BA1
	ET 200SP, AI 8xI 2-/4-Wire Basic	ET 200SP, AI 2xU Standard, PU 1	ET 200SP, AI 8xU Basic	ET 200SP, AI 4xU/I 2-Wire ST, PU 1	ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
<b>Input ranges (rated values), currents</b>					
• 0 to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes				Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
<b>Cable length</b>					
• shielded, max.	200 m	200 m	200 m	1 000 m; 200 m for voltage measurement	1 000 m
<b>Analog value generation for the inputs</b>					
Measurement principle		Sigma Delta		integrating (Sigma-Delta)	Sigma Delta
<b>Integration and conversion time/ resolution per channel</b>					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f <sub>1</sub> in Hz	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz / off	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 250 μs without filter	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 500 μs without filter
<b>Smoothing of measured values</b>					
• Number of smoothing levels	4; None; 4/8/16 times	4	4; None; 4/8/16 times	4; None; 4/8/16 times	4
• parameterizable	Yes	Yes	Yes	Yes	Yes
<b>Encoder</b>					
<b>Connection of signal encoders</b>					
• for voltage measurement	No	Yes	Yes	Yes	
• for current measurement as 2-wire transducer	Yes			Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω			650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes		No	No	Yes
<b>Errors/accuracies</b>					
<b>Basic error limit (operational limit at 25 °C)</b>					
• Voltage, relative to input range, (+/-)		0.3 %	0.3 %	0.3 %	
• Current, relative to input range, (+/-)	0.3 %			0.3 %	0.3 %
<b>Interference voltage suppression for f = n x (f<sub>1</sub> +/- 1 %), f<sub>1</sub> = interference frequency</b>					
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB
• Common mode voltage, max.		10 V		10 V	10 V
• Common mode interference, min.		90 dB		90 dB	90 dB
<b>Interrupts/diagnostics/ status information</b>					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	No	No	No	No	No

**Technical specifications**

Article number	6ES7134-6GF00-0AA1	6ES7134-6FB00-0BA1	6ES7134-6FF00-0AA1	6ES7134-6HD01-0BA1	6ES7134-6GB00-0BA1
	ET 200SP, AI 8xI 2-/4-Wire Basic	ET 200SP, AI 2xU Standard, PU 1	ET 200SP, AI 8xU Basic	ET 200SP, AI 4xU/I 2-Wire ST, PU 1	ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
<b>Diagnoses</b>					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break	Yes; at 4 to 20 mA	No	No	Yes; at 4 to 20 mA	Yes; at 4 to 20 mA
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; at 1 to 5 V	No	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Short-circuit of the encoder supply
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>					
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red LED	Yes; green/red DIAG LED
<b>Potential separation</b>					
<b>Potential separation channels</b>					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262	
Suitable for applications according to CQI-9				Yes	
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS04
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS04
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>					
Weight, approx.	31 g	31 g	31 g	31 g	32 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Analog input modules

#### Technical specifications

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4xI 2-/4-Wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4xI 2-WIRE 4...20MA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
<b>General information</b>				
Product type designation	AI 4xl 2-/4-wire ST	AI 4xl 2-wire HART	AI 2xU/I 2-/4-wire HF	AI 2xU/I 2-/4-wire HS
<b>Product function</b>				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	Yes	Yes
• Measuring range scalable	No	No	No	No
• Scalable measured values				No
• Adjustment of measuring range				No
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/ integrated from version	V14 / -	V13 SP1	V13	V13 SP1
• STEP 7 configurable/integrated from version	V5.6 and higher	V5.5 SP4 and higher	V5.5 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated from version	V8.1 SP1	V8.1 SP1	V8.1 SP1	
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
<b>Operating mode</b>				
• Oversampling	No	No	No	Yes; 2 channels per module
• MSI	No	No	Yes	No
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
<b>Analog inputs</b>				
Number of analog inputs	4; Differential inputs	4; Differential inputs	2; Differential inputs	2; Differential inputs
• For current measurement		4	2	2
• For voltage measurement			2	2
permissible input voltage for voltage input (destruction limit), max.			30 V	30 V
permissible input current for current input (destruction limit), max.	50 mA	50 mA	50 mA	50 mA
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)			125 µs
Analog input with oversampling			No	Yes
• Values per cycle, max.				16
• Resolution, min.				50 µs
Standardization of measured values			Yes	
<b>Input ranges (rated values), voltages</b>				
• 0 to +10 V			Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V			Yes; 15 bit	Yes; 13 bit
• -10 V to +10 V			Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -5 V to +5 V			Yes; 16 bit incl. sign	Yes; 15 bit incl. sign
<b>Input ranges (rated values), currents</b>				
• 0 to 20 mA	Yes; 16 bit incl. sign	No	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes	No	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 15 bit	Yes; 15 bit + sign	Yes; 15 bit	Yes; 14 bit
<b>Cable length</b>				
• shielded, max.	1 000 m	800 m	1 000 m; 200 m for voltage measurement	1 000 m; 200 m for voltage measurement
<b>Analog value generation for the inputs</b>				
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	Sigma Delta	Actual value encryption (successive approximation)



**Technical specifications**

Article number	<b>6ES7134-6GD01-0BA1</b> ET 200SP, AI 4X1 2-/4-Wire ST, PU 1	<b>6ES7134-6TD00-0CA1</b> ET 200SP, AI 4X1 2-WIRE 4...20MA HART	<b>6ES7134-6HB00-0CA1</b> ET 200SP AI 2 X U/I 2-, 4-Wire HF	<b>6ES7134-6HB00-0DA1</b> ET 200SP AI 2 X U/I 2-, 4-Wire HS
<b>Integration and conversion time/ resolution per channel</b>				
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Integration time (ms)</li> <li>Basic conversion time, including integration time (ms)</li> <li>Interference voltage suppression for interference frequency <math>f_1</math> in Hz</li> <li>Conversion time (per channel)</li> <li>Basic execution time of the module (all channels released)</li> </ul>	16 bit Yes  16.6 / 50 / 60 Hz 180 / 60 / 50 ms	16 bit Yes; channel by channel  10 / 50 / 60 Hz	16 bit Yes 67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms 68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms 16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800 68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms 1 ms	16 bit   No 10 $\mu$ s
<b>Smoothing of measured values</b>				
<ul style="list-style-type: none"> <li>Number of smoothing levels</li> <li>parameterizable</li> </ul>	4; None; 4/8/16 times Yes	4; None; 4/8/16 times Yes	6; none; 2-/4-/8-/16-/32-fold Yes	7; none; 2-/4-/8-/16-/32-/64-fold Yes
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
<ul style="list-style-type: none"> <li>for voltage measurement</li> <li>for current measurement as 2-wire transducer - Burden of 2-wire transmitter, max.</li> <li>for current measurement as 4-wire transducer</li> </ul>	No Yes 650 $\Omega$ Yes	No Yes	Yes Yes 650 $\Omega$ Yes	Yes Yes 650 $\Omega$ Yes
<b>Errors/accuracies</b>				
<b>Basic error limit (operational limit at 25 °C)</b>				
<ul style="list-style-type: none"> <li>Voltage, relative to input range, (+/-)</li> <li>Current, relative to input range, (+/-)</li> </ul>	 0.3 %	 0.3 %	0.05 %; 0.1 % at SFU 4.8 kHz 0.05 %; 0.1 % at SFU 4.8 kHz	0.2 % 0.2 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>				
<ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>Common mode voltage, max.</li> <li>Common mode interference, min.</li> </ul>	70 dB 10 V 90 dB	60 dB	 35 V 90 dB	 35 V 90 dB
<b>Isochronous mode</b>				
Filtering and processing time (TCI), min. Bus cycle time (TDP), min.			800 $\mu$ s 1 ms	80 $\mu$ s 125 $\mu$ s; Starting from firmware Version V2.0.1
<b>Interrupts/diagnostics/ status information</b>				
Diagnostics function	Yes	Yes	Yes	
<b>Alarms</b>				
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> <li>Limit value alarm</li> </ul>	Yes No	Yes Yes	Yes Yes; two upper and two lower limit values in each case	Yes Yes; two upper and two lower limit values in each case

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Analog input modules

#### Technical specifications

Article number	<b>6ES7134-6GD01-0BA1</b> ET 200SP, AI 4X1 2-/4-Wire ST, PU 1	<b>6ES7134-6TD00-0CA1</b> ET 200SP, AI 4X1 2-WIRE 4...20MA HART	<b>6ES7134-6HB00-0CA1</b> ET 200SP AI 2 X U/I 2-, 4-Wire HF	<b>6ES7134-6HB00-0DA1</b> ET 200SP AI 2 X U/I 2-, 4-Wire HS
<b>Diagnoses</b>				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; at 4 to 20 mA	Yes; channel by channel	Yes; Measuring range 4 to 20 mA only	Yes; channel-by-channel, at 4 to 20 mA only
• Short-circuit	Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; channel-by-channel, at 1 to 5 V or for short-circuit in encoder supply	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply
• Group error	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes; channel by channel	Yes	Yes
<b>Diagnosics indication LED</b>				
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>				
<b>Potential separation channels</b>				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C; < 0 °C as of FS02	-30 °C	-30 °C; < 0 °C as of FS06	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS02	-30 °C	-30 °C; < 0 °C as of FS06	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>				
Weight, approx.	31 g	31 g	32 g	32 g
Article number	<b>6ES7134-6JF00-0CA1</b> ET 200SP, AI 8xRTD/TC 2-Wire HF	<b>6ES7134-6JD00-0CA1</b> ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	<b>6ES7134-6JD00-0DA1</b> ET 200SP, AI 4x TC HS	
<b>General information</b>				
Product type designation	AI 8xRTD/TC 2-wire HF	AI 4xRTD/TC 2-/3-/4-wire HF	AI 4xTC HS	
<b>Product function</b>				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	
• Isochronous mode	No	No	No	
• Measuring range scalable	Yes		Yes	
• Adjustment of measuring range		Yes		
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/ integrated from version	V14 / -	V14	V15 with HSP 265/integrated as of V15.1	
• STEP 7 configurable/integrated from version			V5.5 SP3 or higher	
• PCS 7 configurable/integrated from version		V8.1 SP1		
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	

**Technical specifications**

Article number	<b>6ES7134-6JF00-0CA1</b> ET 200SP, AI 8xRTD/TC 2-Wire HF	<b>6ES7134-6JD00-0CA1</b> ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	<b>6ES7134-6JD00-0DA1</b> ET 200SP, AI 4x TC HS
<b>Operating mode</b>			
• Oversampling	No	No	No
• MSI	No	No	Yes
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
<b>Analog inputs</b>			
Number of analog inputs	8	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V	30 V
Constant measurement current for resistance-type transmitter, typ.	2 mA	0.7 mA; 1.7 mA for Cu10 sensors	
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary	5 ms; Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K
<b>Input ranges (rated values), voltages</b>			
• -1 V to +1 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -250 mV to +250 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -50 mV to +50 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -80 mV to +80 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
<b>Input ranges (rated values), thermocouples</b>			
• Type B	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type C	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type E	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type J	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type K	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type L	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type N	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type R	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type S	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type T	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type U	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
<b>Input ranges (rated values), resistance thermometer</b>			
• Cu 10		Yes; 16 bit incl. sign	
• Ni 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• LG-Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 120	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Analog input modules****Technical specifications**

Article number	<b>6ES7134-6JF00-0CA1</b> ET 200SP, AI 8xRTD/TC 2-Wire HF	<b>6ES7134-6JD00-0CA1</b> ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	<b>6ES7134-6JD00-0DA1</b> ET 200SP, AI 4x TC HS
<b>Input ranges (rated values), resistors</b>			
• 0 to 150 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 300 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 600 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 3000 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 6000 ohms	Yes; 15 bit	Yes; 15 bit	
• PTC	Yes; 15 bit	Yes; 15 bit	
<b>Thermocouple (TC)</b>			
<b>Temperature compensation</b>			
- parameterizable	Yes	Yes	Yes
<b>Cable length</b>			
• shielded, max.	200 m; 50 m with thermocouples	200 m; 50 m with thermocouples	200 m; 100 m for thermocouples
<b>Analog value generation for the inputs</b>			
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)
<b>Integration and conversion time/resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 ms	180 / 60 / 50 ms	180/60/50/1.25 ms
<b>Smoothing of measured values</b>			
• Number of smoothing levels	4; None; 4/8/16 times	4; None; 4/8/16 times	4; None; 4/8/16 times
• parameterizable	Yes	Yes	Yes
<b>Encoder</b>			
<b>Connection of signal encoders</b>			
• for voltage measurement	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes	Yes	
• for resistance measurement with three-wire connection	No	Yes	
• for resistance measurement with four-wire connection	No	Yes	
<b>Errors/accuracies</b>			
<b>Basic error limit (operational limit at 25 °C)</b>			
• Voltage, relative to input range, (+/-)	0.05 %	0.05 %	0.05 %; 0.2 % when SFU OFF
• Resistance, relative to input range, (+/-)	0.05 %	0.05 %	
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>			
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	70 dB	70 dB
• Common mode voltage, max.	10 V	10 V	60 V; DC
• Common mode interference, min.	90 dB	90 dB	90 dB
<b>Interrupts/diagnostics/status information</b>			
Diagnostics function	Yes	Yes	Yes
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case

#### Technical specifications

Article number	<b>6ES7134-6JF00-0CA1</b> ET 200SP, AI 8xRTD/TC 2-Wire HF	<b>6ES7134-6JD00-0CA1</b> ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	<b>6ES7134-6JD00-0DA1</b> ET 200SP, AI 4x TC HS
<b>Diagnoses</b>			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes	Yes
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
<b>Diagnostics indication LED</b>			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red LED
<b>Potential separation</b>			
<b>Potential separation channels</b>			
• between the channels and backplane bus	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9			Yes; Based on AMS 2750 E
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-30 °C; < 0 °C as of FS05	-30 °C; < 0 °C as of FS08	-30 °C; < 0 °C as of FS02
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS05	-30 °C; < 0 °C as of FS08	-30 °C; < 0 °C as of FS02
• vertical installation, max.	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
<b>Weights</b>			
Weight, approx.			33 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Analog input modules

#### Technical specifications

Article number	<b>7MH4134-6LB00-0DA0</b> ET 200SP AI 2 X SG 4-/6-WIRE HS
<b>General information</b>	
Product type designation	AI 2xSG 4-/6-wire HS
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	Yes; $\pm 0.5 \dots 320$ mV/V
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V14 SP1
• PROFIBUS from GSD version/ GSD revision	V03.01.105
• PROFINET from GSD version/ GSD revision	GSDML V2.33
<b>Operating mode</b>	
• Oversampling	Yes; 2 channels per module
• MSI	No
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Analog inputs</b>	
Number of analog inputs	2; Differential inputs
Cycle time (all channels), min.	100 $\mu$ s
Analog input with oversampling	Yes
• Values per cycle, max.	14
• Resolution, min.	100 $\mu$ s
<b>Input ranges</b>	
• Strain gauges (full bridges)	Yes
<b>Cable length</b>	
• shielded, max.	500 m
<b>Analog value generation for the inputs</b>	
Measurement principle	Sigma Delta
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	28 bit; 16 bits with oversampling
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	60 / 50 Hz / no
• Conversion time (per channel)	100 $\mu$ s
<b>Smoothing of measured values</b>	
• IIR low-pass filter frequency	0.01 ... 600 Hz
• Notch filter frequency	0.1 ... 1 000 Hz
• Notch filter quality	5.00 ... 250.00
• Average value filter	0.1 ... 655.3 ms
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• For strain gauges (full bridges) with 4-conductor connection	Yes
• For strain gauges (full bridges) with 6-conductor connection	Yes
• Resistance of full bridge, min.	80 $\Omega$
• Resistance of full bridge, max.	5 000 $\Omega$

Article number	<b>7MH4134-6LB00-0DA0</b> ET 200SP AI 2 X SG 4-/6-WIRE HS
<b>Errors/accuracies</b>	
Temperature coefficient, zero point	$\leq \pm 0.25$ $\mu$ V/K
Temperature coefficient, span, 4-wire connection (in relation to end value)	$\leq \pm 5$ ppm/K
Temperature coefficient, span, 6-wire connection (in relation to end value)	$\leq \pm 10$ ppm/K
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.05 %; See manual for details
<b>Isochronous mode</b>	
Filtering and processing time (TCI), min.	87 $\mu$ s
Bus cycle time (TDP), min.	125 $\mu$ s
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
• Overflow/underflow	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Ambient air temperature- barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	45 g

### Technical specifications

Article number	<b>6ES7134-6PA01-0BU0</b> ET 200SP AI Energy Meter CT ST	<b>6ES7134-6PA21-0BU0</b> ET 200SP AI Energy Meter RC ST	<b>6ES7134-6PA01-0CU0</b> ET 200SP AI Energy Meter CT HF	<b>6ES7134-6PA21-0CU0</b> ET 200SP AI Energy Meter RC HF
<b>General information</b>				
Product type designation	AI Energy Meter CT ST	AI Energy Meter RC ST	AI Energy Meter CT HF	AI Energy Meter RC HF
<b>Product function</b>				
• Voltage measurement	Yes	Yes	Yes	Yes
- without voltage transformer	Yes	Yes	Yes	Yes
- with voltage transformer	Yes	Yes	Yes	Yes
• Current measurement	Yes; max. 3 + neutral conductor	Yes; max. 3 + neutral conductor	Yes; Max. 4	Yes; Max. 4
- without current transformer	No	No	No	No
- with current transformer	Yes; 1 A or 5 A current transformer	No	Yes; 1 A or 5 A current transformer	No
- With Rogowski coil	No	Yes	No	Yes
- With current-voltage-converter	No	Yes; 333 mV interface	No	Yes; 333 mV interface
• Energy measurement	Yes	Yes	Yes	Yes
• Frequency measurement	Yes	Yes	Yes	Yes
• Power measurement	Yes	Yes	Yes	Yes
• Active power measurement	Yes	Yes	Yes	Yes
• Reactive power measurement	Yes	Yes	Yes	Yes
• Power factor measurement	Yes	Yes	Yes	Yes
• Active factor measurement	Yes	Yes	Yes	Yes
• Reactive power compensation	Yes	Yes	Yes	Yes
• Line analysis	No	No	Yes	Yes
- Monitoring of instantaneous and half-wave values			Yes	Yes
- THD measurement for current and voltage			Yes	Yes
- Harmonics for current and voltage			Yes	Yes
- Voltage dip (DIP)			Yes	Yes
- Voltage swell			Yes	Yes
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	No	No
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	Configurable via GSD file	Configurable via GSD file	V5.5 SP3 or higher	V5.5 SP3 or higher
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	V2.3	V2.3	V2.3	V2.3
<b>Operating mode</b>				
• Switching between operating modes in RUN	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user
• Cyclic measured value access	Yes	Yes	Yes	Yes
• Acyclic measured value access	Yes	Yes	Yes	Yes
• Fixed measured value sets	Yes	Yes	Yes	Yes
• Freely definable measured value sets	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access
<b>Installation type/mounting</b>				
Mounting position	any	any	any	any
<b>Supply voltage</b>				
Design of the power supply	DC	DC	DC	DC
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**I/O modules > Analog input modules****Technical specifications**

Article number	<b>6ES7134-6PA01-0BU0</b> ET 200SP AI Energy Meter CT ST	<b>6ES7134-6PA21-0BU0</b> ET 200SP AI Energy Meter RC ST	<b>6ES7134-6PA01-0CU0</b> ET 200SP AI Energy Meter CT HF	<b>6ES7134-6PA21-0CU0</b> ET 200SP AI Energy Meter RC HF
<b>Analog inputs</b>				
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)
<b>Cable length</b>				
• shielded, max.	200 m	200 m	200 m	200 m
<b>Interrupts/diagnostics/ status information</b>				
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
<b>Diagnoses</b>				
• Line quality			Yes	Yes
• Supply voltage	Yes	Yes	Yes	Yes
• Hardware interrupt lost	Yes	Yes	Yes	Yes
• Parameter assignment error	Yes	Yes	Yes	Yes
• Module fault	Yes	Yes	Yes	Yes
• Channel not available	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes
• Overload current	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes	Yes	Yes
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Integrated Functions</b>				
<b>Measuring functions</b>				
• Measuring procedure for voltage measurement	TRMS	TRMS	TRMS	TRMS
• Measuring procedure for current measurement	TRMS	TRMS	TRMS	TRMS
• Type of measured value acquisition	seamless	seamless	seamless	seamless
• Curve shape of voltage	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted
• Buffering of measured variables	Yes	Yes	Yes	Yes
• Parameter length	128 byte	128 byte	128 byte	128 byte
• Bandwidth of measured value acquisition	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz
<b>Measuring range</b>				
- Frequency measurement, min.	40 Hz	40 Hz	40 Hz	40 Hz
- Frequency measurement, max.	70 Hz	70 Hz	70 Hz	70 Hz
<b>Measuring inputs for voltage</b>				
- Measurable line voltage between phase and neutral conductor	277 V	277 V	277 V	277 V
- Measurable line voltage between the line conductors	480 V	480 V	480 V	480 V
- Measurable line voltage between phase and neutral conductor, min.	3 V	3 V	3 V	3 V
- Measurable line voltage between phase and neutral conductor, max.	300 V	300 V	300 V	300 V
- Measurable line voltage between the line conductors, min.	6 V	6 V	6 V	6 V
- Measurable line voltage between the line conductors, max.	519 V	519 V	519 V	519 V



### Technical specifications

Article number	<b>6ES7134-6PA01-0BU0</b> ET 200SP AI Energy Meter CT ST	<b>6ES7134-6PA21-0BU0</b> ET 200SP AI Energy Meter RC ST	<b>6ES7134-6PA01-0CU0</b> ET 200SP AI Energy Meter CT HF	<b>6ES7134-6PA21-0CU0</b> ET 200SP AI Energy Meter RC HF
<b>Measuring inputs for voltage (continued)</b>				
- Internal resistance line conductor and neutral conductor	1.5 MΩ	1.5 MΩ	1.5 MΩ	1.5 MΩ
- Power consumption per phase	60 mW; 300 V AC	60 mW; 300 V AC	60 mW; 300 V AC	60 mW; 300 V AC
- Impulse voltage resistance 1,2/50μs	2.5 kV	2.5 kV	2.5 kV	2.5 kV
- Overvoltage category		CAT II according to IEC 61010 Part 1		CAT II according to IEC 61010 Part 1
<b>Measuring inputs for current</b>				
- measurable relative current (AC), min.	1 %; Relative to measuring range; 1 A, 5 A		1 %; Relative to measuring range; 1 A, 5 A	
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current 5 A		120 %; Relative to the secondary rated current 5 A	
- Continuous current with AC, maximum permissible	5 A		5 A; 6 A permanent thermal overload	
- Apparent power consumption per phase for measuring range 5 A	0.6 V·A		0.6 V·A	
- Rated value short-time withstand current restricted to 1 s	100 A		100 A	
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal		25 mΩ; At the terminal	
- Surge strength	10 A; for 1 minute		10 A; for 1 minute	
- Zero point suppression	0 ... 20%, referred to the nominal current		0 ... 20%, referred to the nominal current	
<b>Measuring inputs for current (Rog. or I/U converter)</b>				
- Measurable current at AC, max.		424 mV		424 mV
- Continuous voltage, maximum permissible		2 V		2 V
- Rated value, short-time withstand voltage restricted to 1 s		30 V		30 V
- Input resistance		120 kΩ		120 kΩ
- Zero point suppression		Yes; 0 ... 20%, referred to the nominal current		Yes; 0 ... 20%, referred to the nominal current
<b>Accuracy class according to IEC 61557-12</b>				
- Measured variable apparent power	0.5	0.5	0.5	0.5
- Measured variable active power	0.5	0.5	0.5	0.5
- Measured variable power factor	0.5	0.5	0.5	0.5
- Measured variable active energy	0.5	0.5	0.5	0.5
- Measured variable phase angle	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12
- Measured variable frequency	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range
<b>Accuracy class line analysis acc. to IEC 61000-4-30</b>				
- Measured variable voltage			Class S	Class S
- Measured variable current			Class S	Class S
- Measured variable frequency			Class S	Class S
- Measured variable voltage interruption			Class S	Class S
- Measured variable voltage dip and swell			Class S	Class S
- Measured variable harmonic voltage			Class S	Class S
- Measured variable harmonic current			Class S	Class S

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**I/O modules > Analog input modules****Technical specifications**

Article number	<b>6ES7134-6PA01-0BU0</b> ET 200SP AI Energy Meter CT ST	<b>6ES7134-6PA21-0BU0</b> ET 200SP AI Energy Meter RC ST	<b>6ES7134-6PA01-0CU0</b> ET 200SP AI Energy Meter CT HF	<b>6ES7134-6PA21-0CU0</b> ET 200SP AI Energy Meter RC HF
<b>Potential separation</b>				
<b>Potential separation channels</b>				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>				
Width	20 mm	20 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>				
Weight, approx.	45 g	45 g	45 g	45 g
<b>Other</b>				
<b>Data for selecting a voltage transformer</b>				
• Secondary side, max.	300 V	300 V	300 V	300 V
<b>Data for selecting a current transformer</b>				
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual		As a function of cable length and cross section, see device manual	
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual		As a function of cable length and cross section, see device manual	

## Overview



- 2 and 4-channel analog output (AQ) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the analog output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)

- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - Oversampling operating mode (n-fold equidistant output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
  - Isochronous mode (simultaneous equidistant output of analog values)
  - Output of substitute value in the event of interruptions to communication (shutdown, output adjustable substitute value, or keep last value)
  - Calibration during runtime
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break, short-circuit, overflow, underflow
  - Value status (optional binary validity information of the analog value status in the process image)
  - Supports the PROFInenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

## Overview of analog output modules

Analog output	PU	Article No.	CC code	BU type
AQ 2 x U ST	1	6ES7135-6FB00-0BA1	CC00	A0, A1
AQ 2 x I ST	1	6ES7135-6GB00-0BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6ES7135-6HD00-0BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6ES7135-6HB00-0CA1	CC00	A0, A1
AQ 2xU/I HS	1	6ES7135-6HB00-0DA1	CC00	A0, A1
With two operating modes: • High-speed isochronous AQ • Oversampling				
AQ 4xI HART HF	1	6ES7135-6TD00-0CA1	CC00	A0, A1

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Analog output modules****Overview**

## Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
<b>BU type A0</b> • New potential group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
<b>BU type A0</b> • Forwarding of the potential group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
<b>BU type A1</b> • New potential group (light) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
<b>BU type A1</b> • New potential group (light) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
<b>BU type A1</b> • Forwarding of the potential group (dark) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
<b>BU type A1</b> • Forwarding of the potential group (dark) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--

**Overview**Overview of potential distributor modules

Potential distributor module	PU	Article No.	CC codes for push-in terminals
<b>PotDis BU</b> Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
<b>PotDis BU</b> Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
<b>PotDis BU</b> Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
<b>PotDis BU</b> Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
<b>PotDis TB</b> Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
<b>PotDis TB</b> Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
<b>PotDis TB</b> Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
<b>PotDis TB</b> Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Analog output modules****Ordering data****Article No.****Article No.****Analog output modules**

Analog output module  
AQ 2xU Standard, BU type A0 or  
A1, color code CC00, 16-bit

**6ES7135-6FB00-0BA1**

Analog output module  
AQ 2xI Standard, BU type A0 or A1,  
color code CC00, 16-bit

**6ES7135-6GB00-0BA1**

Analog output module  
AQ 4xU/I Standard,  
BU type A0 or A1,  
color code CC00, 16-bit, ± 0.3%

**6ES7135-6HD00-0BA1**

Analog output module  
AQ 2xU/I High Feature,  
BU type A0 or A1,  
color code CC00, 16-bit, ±0.1%

**6ES7135-6HB00-0CA1**

Analog output module  
AQ 2xU/I High Speed,  
BU type A0 or A1,  
color code CC00, 16-bit, ± 0.3%

**6ES7135-6HB00-0DA1**

Analog output module  
AQ 4xI HART High Feature,  
BU type A0 or A1,  
color code CC00, 16-bit, ±0.3%

**6ES7135-6TD00-0CA1****Usable type A0 BaseUnits**

Type of delivery:  
Apart from the standard type of  
delivery in a single-unit package,  
selected BaseUnits are also  
available in a pack of 10 units.  
The pack of 10 units enables the  
amount of waste to be reduced  
considerably, as well as saving  
the time and cost of unpacking  
individual modules.

The number of modules required is  
the number of modules ordered.  
The pack type is selected by  
selecting the article number.  
Packs of 10 can therefore only be  
ordered in integer multiples of 10.

**BU15-P16+A10+2D**

BU type A0; BaseUnit (light) with  
16 push-in terminals (1 ... 16)  
to the module and an additional  
10 internally jumpered  
AUX terminals (1 A to 10 A);  
for starting a new potential group  
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0****BU15-P16+A0+2D**

BU type A0; BaseUnit (light) with  
16 push-in terminals to the module;  
for starting a new potential group  
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0****2BU15-P16+A0+2DB**

Double BaseUnit  
for holding 2 I/O modules;  
BU type A0; BaseUnit (light/dark)  
with 16 push-in terminals to the  
module; for starting a new potential  
group (max. 10 A)

- Pack of 1 unit

**6ES7193-6BP60-0DA0****BU15-P16+A10+2B**

BU type A0; BaseUnit (dark)  
with 16 push-in terminals (1 ... 16)  
to the module and an  
additional 10 internally jumpered  
AUX terminals (1 A to 10 A);  
for continuing the potential group

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0****BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with  
16 push-in terminals to the module;  
for continuing the potential group

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0****2BU15-P16+A0+2B**

Double BaseUnit  
for holding 2 I/O modules;  
BU type A0; BaseUnit (dark/dark)  
with 16 push-in terminals to the  
module; for continuing the potential  
group

- Pack of 1 unit

**6ES7193-6BP60-0BA0****Usable type A1 BaseUnits  
(temperature detection)****BU15-P16+A0+12D/T**

BU type A1; BaseUnit (light)  
with 16 push-in terminals (1 ... 16)  
to the module and 2x5 internally  
jumpered additional terminals  
(1 B to 5 B and 1 C to 5 C);  
for starting a new potential group  
(max. 10 A)

**6ES7193-6BP40-0DA1****BU15-P16+A0+2D/T**

BU type A1; BaseUnit (light) with  
16 push-in terminals to the module;  
for starting a new potential group  
(max. 10 A)

**6ES7193-6BP00-0DA1****BU15-P16+A0+12B/T**

BU type A1; BaseUnit (dark)  
with 16 push-in terminals (1 ... 16)  
to the module and 2x5 internally  
jumpered additional terminals  
(1 B to 5 B and 1 C to 5 C);  
for continuing the potential group

**6ES7193-6BP40-0BA1****BU15-P16+A0+2B/T**

BU type A1; BaseUnit (dark) with  
16 push-in terminals to the module;  
for continuing the potential group

**6ES7193-6BP00-0BA1**

Ordering data	Article No.	Article No.
<b>Potential distributor modules</b>		<b>Shield connection</b>
<b>PotDis BU</b>		5 shield supports and 5 shield terminals
PotDis BU, Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	<b>6ES7193-6UP00-ODP1</b>	<b>Color-coded labels</b>
PotDis BU, Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	<b>6ES7193-6UP00-OBP1</b>	Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units
PotDis BU, Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	<b>6ES7193-6UP00-ODP2</b>	Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units
PotDis BU, Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	<b>6ES7193-6UP00-OBP2</b>	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units
<b>PotDis TB</b>		Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units
PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	<b>6ES7193-6TP00-OTPO</b>	Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	<b>6ES7193-6TP00-OTP1</b>	<b>Color-coded labels for PotDis BU</b>
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	<b>6ES7193-6TP00-OTP2</b>	Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	<b>6ES7193-6TP00-OTNO</b>	Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units
<b>Accessories</b>		<b>Color-coded labels for PotDis TB</b>
<b>Equipment labeling plate</b>	<b>6ES7193-6LF30-0AW0</b>	Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter		Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units
<b>Labeling strips</b>		Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	<b>Mechanical coding elements</b>
1 000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>	For automatic coding of I/O modules; spare part. 20 units
1 000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>	Type A
<b>BU cover</b>		Type B
For covering empty slots (gaps); 5 units		Type C
• 15 mm	<b>6ES7133-6CV15-1AM0</b>	Type D
• 20 mm	<b>6ES7133-6CV20-1AM0</b>	
		<b>6ES7193-6KA00-3AA0</b>
		<b>6ES7193-6KB00-3AA0</b>
		<b>6ES7193-6KC00-3AA0</b>
		<b>6ES7193-6KD00-3AA0</b>

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Analog output modules

#### Technical specifications

Article number	6ES7135-6FB00-0BA1	6ES7135-6GB00-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HB00-0DA1	6ES7135-6HB00-0CA1
	ET 200SP, AQ 2xU Standard, PU 1	ET 200SP, AQ 2xI Standard, PU 1	ET 200SP, AQ 4xU/I ST	ET 200SP, AQ 2 X U/I High Speed	ET 200SP, AQ 2 X U/I High Feature
<b>General information</b>					
Product type designation	AQ 2xU ST	AQ 2xI ST	AQ 4xU/I ST	AQ 2xU/I HS	AQ 2xU/I HF
<b>Product function</b>					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	No	Yes	Yes
• Output range scalable	No	No	No		
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1 / -	V11 SP2 / V13	V13 SP1	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated from version			V8.1 SP1		V8.1 SP1
• PROFIBUS from GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
<b>Operating mode</b>					
• Oversampling	No	No	No	Yes; 2 channels per module	No
• MSO	No	No	No	No	No
<b>Supply voltage</b>					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
<b>Analog outputs</b>					
Number of analog outputs	2	2	4	2	2
Cycle time (all channels), min.	1 ms	1 ms	5 ms	125 µs	750 µs
Analog output with oversampling	No	No	No	Yes	
• Values per cycle, max.				16	
• Resolution, min.				45 µs; (2 channels), 35 µs (1 channel)	
<b>Output ranges, voltage</b>					
• 0 to 10 V	Yes; 15 bit		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V	Yes; 13 bit		Yes; 13 bit	Yes; 13 bit	Yes; 13 bit
• -5 V to +5 V	Yes; 15 bit incl. sign		Yes; 15 bit incl. sign	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
<b>Output ranges, current</b>					
• 0 to 20 mA		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA		Yes; 14 bit	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit
<b>Connection of actuators</b>					
• for voltage output two-wire connection	Yes		Yes	Yes	Yes
• for voltage output four-wire connection	No		Yes	Yes	Yes
• for current output two-wire connection		Yes	Yes	Yes	Yes
<b>Load impedance (in rated range of output)</b>					
• with voltage outputs, min.	2 kΩ		2 kΩ	2 kΩ	2 kΩ
• with voltage outputs, capacitive load, max.	1 µF		1 µF	1 µF	1 µF
• with current outputs, max.		500 Ω	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.		1 mH	1 mH	1 mH	1 mH
<b>Cable length</b>					
• shielded, max.	200 m	1 000 m	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output



**Technical specifications**

Article number	6ES7135-6FB00-0BA1	6ES7135-6GB00-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HB00-0DA1	6ES7135-6HB00-0CA1
	ET 200SP, AQ 2xU Standard, PU 1	ET 200SP, AQ 2xI Standard, PU 1	ET 200SP, AQ 4xU/I ST	ET 200SP, AQ 2 X U/I High Speed	ET 200SP, AQ 2 X U/I High Feature
<b>Analog value generation for the outputs</b>					
<b>Integration and conversion time/resolution per channel</b>					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
<b>Settling time</b>					
• for resistive load	0.1 ms	0.1 ms; Typical value	0.1 ms	0.05 ms	0.05 ms
• for capacitive load	1 ms		1 ms	0.05 ms; Max. 47 nF and 20 m cable length	0.05 ms; Max. 47 nF and 20 m cable length
• for inductive load		0.5 ms	0.5 ms	0.05 ms	0.05 ms
<b>Errors/accuracies</b>					
<b>Basic error limit (operational limit at 25 °C)</b>					
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
<b>Isochronous mode</b>					
Execution and activation time (TCO), min.				70 µs	500 µs
Bus cycle time (TDP), min.				125 µs	750 µs
<b>Interrupts/diagnostics/status information</b>					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
<b>Diagnoses</b>					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break		Yes	Yes	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes		Yes	Yes; channel-by-channel, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>					
<b>Potential separation channels</b>					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS04
• horizontal installation, max.	60 °C	60 °C	60 °C; Observe derating	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS04
• vertical installation, max.	50 °C	50 °C	50 °C; Observe derating	50 °C	50 °C

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Analog output modules

#### Technical specifications

Article number	6ES7135-6FB00-0BA1	6ES7135-6GB00-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HB00-0DA1	6ES7135-6HB00-0CA1
	ET 200SP, AQ 2xU Standard, PU 1	ET 200SP, AQ 2xI Standard, PU 1	ET 200SP, AQ 4xU/I ST	ET 200SP, AQ 2 X U/I High Speed	ET 200SP, AQ 2 X U/I High Feature
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
<b>Weights</b>					
Weight, approx.	31 g	31 g	31 g	31 g	31 g
Article number	<b>6ES7135-6TD00-0CA1</b> ET 200SP, AQ 4xI HART HF			Article number	<b>6ES7135-6TD00-0CA1</b> ET 200SP, AQ 4xI HART HF
<b>General information</b>	Product type designation: AQ 4xI HART HF			<b>Interrupts/diagnostics/status information</b>	
<b>Product function</b>	• I&M data: Yes; I&M0 to I&M3			Diagnosics function	Yes
<b>Engineering with</b>	• STEP 7 configurable/integrated from version: V5.6 and higher • PCS 7 configurable/integrated from version: V9.0 SP1			Substitute values connectable	Yes
<b>Supply voltage</b>	Rated value (DC): 24 V Reverse polarity protection: Yes			<b>Alarms</b>	
<b>Analog outputs</b>	Number of analog outputs: 4 Cycle time (all channels), min.: 3 ms			• Diagnostic alarm	Yes
<b>Output ranges, current</b>	• 0 to 20 mA: Yes; 16 bit incl. sign • -20 mA to +20 mA: No • 4 mA to 20 mA: Yes; 16 bit incl. sign			<b>Diagnoses</b>	
<b>Connection of actuators</b>	• for current output two-wire connection: Yes			• Monitoring the supply voltage: Yes; Module-wise • Wire-break: Yes; channel by channel • Short-circuit: Yes • Overflow/underflow: Yes; channel by channel	
<b>Load impedance (in rated range of output)</b>	• with current outputs, max.: 750 Ω • with current outputs, inductive load, max.: 10 mH			<b>Diagnosics indication LED</b>	
<b>Cable length</b>	• shielded, max.: 800 m			• Monitoring of the supply voltage (PWR-LED): Yes; green PWR LED • Channel status display: Yes; green LED • for channel diagnostics: Yes; red LED • for module diagnostics: Yes; green/red DIAG LED	
<b>Settling time</b>	• for resistive load: 2 ms; 750 ohm • for capacitive load: 2 ms • for inductive load: 2 ms			<b>Potential separation</b>	
<b>Errors/accuracies</b>				<b>Potential separation channels</b>	• between the channels and backplane bus: Yes
<b>Basic error limit (operational limit at 25 °C)</b>	• Current, relative to output range, (+/-): 0.1 %			<b>Ambient conditions</b>	
<b>Protocols</b>	HART protocol: Yes			<b>Ambient temperature during operation</b>	
				• horizontal installation, min.: -30 °C • horizontal installation, max.: 60 °C • vertical installation, min.: -30 °C • vertical installation, max.: 50 °C	
				<b>Altitude during operation relating to sea level</b>	• Installation altitude above sea level, max.: 5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
				<b>Dimensions</b>	
				Width	15 mm
				Height	73 mm
				Depth	58 mm
				<b>Weights</b>	
				Weight, approx.	31 g

### Overview



- 4, 8 and 16-channel digital input (DI) modules

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distribution modules for system-integrated expansion with additional potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for rated voltages of up to 24 V DC or 230 V AC
- PNP (sinking input) and NPN (sourcing input) versions
- Clear labeling on front of module

- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
  - Counting operating mode (multi-channel counter for pulse generators with 32-bits counting width and up to 10 kHz counting frequency)
  - Oversampling operating mode (n-fold equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Parameterizable input delay time
  - Isochronous mode (simultaneous equidistant reading of all input channels)
  - Hardware interrupt pulse stretching
  - Re-parameterization during operation
  - Firmware update
  - Diagnosis of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the input signal in the process image)
  - Supports the PROFlenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS digital input modules

(Extended temperature range and exposure to environmental substances)

DI 8x24VDC Standard, BU type A0, color code CC01

**6AG1131-6BF01-7BA0**

DI 8x24VDC Sourcing Input, Basic, BU type A0, color code CC02

**6AG1131-6BF61-7AA0**

DI 16x24VDC Standard, BU type A0, color code CC00

**6AG1131-6BH01-7BA0**

DI 8x24VDC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI)

**6AG1131-6BF00-7CA0**

DI 4x120VAC-230VAC Standard, BU type B1, color code CC41

**6AG1131-6FD01-7BB1**

DI 8xNAMUR High Feature, BU type A0, color code CC01

**6AG1131-6TF00-7CA0**

DI 8x24VAC-48VUC Basic, BU type U0, color code CC20, module diagnostics

**6AG1131-6CF00-7AU0**

### Article No.

#### Usable SIPLUS BaseUnits

##### BU15-P16+A0+2D

**6AG1193-6BP00-7DA0**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

##### BU15-P16+A0+2B

**6AG1193-6BP00-7BA0**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

##### BU15-P16+A10+2D

**6AG1193-6BP20-7DA0**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > SIPLUS digital inputs**

Ordering data	Article No.	Ordering data	Article No.
<b>BU15-P16+A10+2B</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	<b>6AG1193-6BP20-7BA0</b>	<b>BU20-P16+A0+2B</b> (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BU0</b>
<b>BU20-P12+A0+4B</b> (Extended temperature range and exposure to environmental substances) BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group	<b>6AG1193-6BP20-7BB1</b>	<b>Accessories</b> <b>SIPLUS Mounting Kit ET 200SP</b> Mounting accessories for use with increased mechanical vibration and shock loads.	<b>6AG1193-6AA00-0AA0</b>
<b>BU20-P16+A0+2D</b> (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DU0</b>	<b>Other accessories</b> See SIMATIC ET 200SP, digital input modules, page 10/26	

**Technical specifications**

Article number	<b>6AG1131-6BF61-7AA0</b>	<b>6AG1131-6BF01-7BA0</b>	<b>6AG1131-6BH01-7BA0</b>
Based on	<b>6ES7131-6BF61-0AA0</b> SIPLUS ET 200SP DI 8x24VDC SOURCE BA	<b>6ES7131-6BF01-0BA0</b> SIPLUS ET 200SP DI 8x24VDC ST	<b>6ES7131-6BH01-0BA0</b> SIPLUS ET 200SP DI 16x24VDC ST
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

### Technical specifications

Article number	<b>6AG1131-6BF61-7AA0</b>	<b>6AG1131-6BF01-7BA0</b>	<b>6AG1131-6BH01-7BA0</b>	
Based on	<b>6ES7131-6BF61-0AA0</b> SIPLUS ET 200SP DI 8x24VDC SOURCE BA	<b>6ES7131-6BF01-0BA0</b> SIPLUS ET 200SP DI 8x24VDC ST	<b>6ES7131-6BH01-0BA0</b> SIPLUS ET 200SP DI 16x24VDC ST	
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	
Article number	<b>6AG1131-6BF00-7CA0</b>	<b>6AG1131-6FD01-7BB1</b>	<b>6AG1131-6TF00-7CA0</b>	<b>6AG1131-6CF00-7AU0</b>
Based on	<b>6ES7131-6BF00-0CA0</b> SIPLUS ET 200SP DI 8x24VDC HF	<b>6ES7131-6FD01-0BB1</b> SIPLUS ET 200SP DI 4X120...230VAC ST	<b>6ES7131-6TF00-0CA0</b> SIPLUS ET 200SP DI 8XNAMUR HF	<b>6ES7131-6CF00-0AU0</b> SIPLUS ET 200SP DI 8x48VUC BA
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C encoder supply output current max. 350 mA per channel	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 4 (no adjacent points)	70 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	2 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > SIPLUS digital inputs****Technical specifications**

Article number	<b>6AG1131-6BF00-7CA0</b>	<b>6AG1131-6FD01-7BB1</b>	<b>6AG1131-6TF00-7CA0</b>	<b>6AG1131-6CF00-7AU0</b>
Based on	<b>6ES7131-6BF00-0CA0</b> SIPLUS ET 200SP DI 8x24VDC HF	<b>6ES7131-6FD01-0BB1</b> SIPLUS ET 200SP DI 4X120..230VAC ST	<b>6ES7131-6TF00-0CA0</b> SIPLUS ET 200SP DI 8XNAMUR HF	<b>6ES7131-6CF00-0AU0</b> SIPLUS ET 200SP DI 8x48VUC BA
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## 3 Overview



- 4, 8 and 16-channel DQ modules
- 4-channel RQ modules
- BaseUnits for single conductor or multiple-conductor connection
- Function classes Basic, Standard, High Feature and High-Speed as well as fail-safe DQ and RQ
- Clear labeling on front of module
- LEDs for diagnostics, status and errors
- Individual system-integrated load group formation with self-assembling potential multi-terminal busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
  - Labeling strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shielding terminal

## Overview of digital output modules

Digital output	PU	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A ST	1	6AG1132-6BH01-7BA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6AG1132-6BF61-7AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A ST	1	6AG1132-6BF01-7BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6AG1132-6BF00-7CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6AG1132-6BD20-7BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6AG1132-6BD20-7CA0	CC02	A0
DQ 4 x 24 ... 230 V AC/2 A HF	1	6AG1132-6FD00-7CU0	CC20	U0
With two operating modes:				
• DQ				
• PC: Power control via phase angle, half-wave or full-wave control				
RQ 4 x 24 V UC/2 A CO ST	1	6AG1132-6GD51-7BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6AG1132-6HD01-7BB1	--	B0, B1

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > SIPLUS digital outputs****Ordering data****Article No.****Article No.****SIPLUS digital output modules**

(Extended temperature range and exposure to environmental substances)

Digital output module  
DQ 8x24VDC/0.5A Sinking output, Basic, BU type A0, color code CC01**6AG1132-6BF61-7AA0**Digital output module  
DQ 4x24VDC/2A Standard, BU type A0, color code CC02**6AG1132-6BD20-7BA0**Digital output module  
DQ 8x24VDC/0.5A Standard, BU type A0, color code CC02**6AG1132-6BF01-7BA0**Digital output module  
DQ 8x24VDC/0.5A High Feature, BU type A0, color code CC02**6AG1132-6BF00-7CA0**Digital output module  
DQ 16x24VDC/0.5A Standard, BU type A0, color code CC00**6AG1132-6BH01-7BA0**Digital output module  
DQ 4x24VDC/2A High Feature, BU type A0, color code CC02, channel-precise diagnostics, isochronous mode, shared output (MSO); PU: 1 unit**6AG1132-6BD20-7CA0**Signal relay module  
RQ CO 4x24VUC/2A Standard, changeover contact, BU type A0, color code CC00**6AG1132-6GD51-7BA0**Relay module  
RQ NO 4x120VDC-230VAC/5A Standard, NO contact, BU type B0, B1**6AG1132-6HD01-7BB1**Digital output module  
DQ 4x24VAC...230VAC/2A High Feature for BU type U0, color code CC20, 2 operating modes: DQ and PC (power control via phase angle, half-wave and full-wave control)**6AG1132-6FD00-7CU0****Usable SIPLUS BaseUnits****BU15-P16+A10+2D****6AG1193-6BP20-7DA0**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

**BU15-P16+A0+2D****6AG1193-6BP00-7DA0**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**BU15-P16+A10+2B****6AG1193-6BP20-7BA0**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

**BU15-P16+A0+2B****6AG1193-6BP00-7BA0**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**BU20-P12+A4+0B****6AG1193-6BP20-7BB0**

(Extended temperature range and exposure to environmental substances)

BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group; 1 unit

**BU20-P12+A0+4B****6AG1193-6BP20-7BB1**

(Extended temperature range and exposure to environmental substances)

BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; 1 unit

**BU20-P16+A0+2D****6AG1193-6BP00-7DU0**

(Extended temperature range and exposure to environmental substances)

BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**BU20-P16+A0+2B****6AG1193-6BP00-7BU0**

(Extended temperature range and exposure to environmental substances)

BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**Accessories****SIPLUS Mounting Kit ET 200SP****6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads.

**Other accessories**

See SIMATIC ET 200SP, digital output modules, page 10/37



#### Technical specifications

Article number	6AG1132-6BF61-7AA0	6AG1132-6BD20-7BA0	6AG1132-6BF01-7BA0
Based on	6ES7132-6BF61-0AA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A SNK BA	6ES7132-6BD20-0BA0 SIPLUS ET200SP DQ 4x24VDC/2A ST	6ES7132-6BF01-0BA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A ST
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 2x 0.25 A or max. 4x 0.125 A, max. total current 0.5 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A
• vertical installation, min.		-40 °C; = Tmin	
• vertical installation, max.		50 °C; = Tmax	
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > SIPLUS digital outputs****Technical specifications**

Article number	<b>6AG1132-6BF61-7AA0</b>	<b>6AG1132-6BD20-7BA0</b>	<b>6AG1132-6BF01-7BA0</b>
Based on	<b>6ES7132-6BF61-0AA0</b> SIPLUS ET 200SP DQ 8x24VDC/0,5A SNK BA	<b>6ES7132-6BD20-0BA0</b> SIPLUS ET200SP DQ 4x24VDC/2A ST	<b>6ES7132-6BF01-0BA0</b> SIPLUS ET 200SP DQ 8x24VDC/0,5A ST
<b>Conformal coating</b>			
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>
Article number	<b>6AG1132-6BH01-7BA0</b>	<b>6AG1132-6BF00-7CA0</b>	<b>6AG1132-6GD51-7BA0</b>
Based on	<b>6ES7132-6BH01-0BA0</b> SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	<b>6ES7132-6BF00-0CA0</b> SIPLUS ET 200SP DQ 8X24VDC/0,5A HF	<b>6ES7132-6GD51-0BA0</b> SIPLUS ET 200SP RQ 4x24VDC/2A CO ST
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin (incl. condensation/frost)</li> <li>70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax &gt; 60 °C max. total current 1 A</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin (incl. condensation/frost)</li> <li>70 °C; = Tmax; &gt; +60 °C max. total current 1.0 A</li> <li>-40 °C; = Tmin</li> <li>50 °C; = Tmax</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin (incl. condensation/frost)</li> <li>70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax &gt; 60 °C max. aggregate current 2 A per group</li> </ul>
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	<ul style="list-style-type: none"> <li>5 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)</li> </ul>	<ul style="list-style-type: none"> <li>5 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)</li> </ul>	<ul style="list-style-type: none"> <li>5 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)</li> </ul>
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> <li>Against mechanical environmental conditions acc. to EN 60721-3-3</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> <li>Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> <li>Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna)</li> <li>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 3S4 incl. sand, dust, *</li> <li>Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</li> </ul>
<b>Use on ships/at sea</b>			
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> <li>Against mechanical environmental conditions acc. to EN 60721-3-6</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request</li> <li>Yes; Class 6C3 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 6S3 incl. sand, dust; *</li> <li>Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request</li> <li>Yes; Class 6C3 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 6S3 incl. sand, dust; *</li> <li>Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request</li> <li>Yes; Class 6C3 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</li> <li>Yes; Class 6S3 incl. sand, dust; *</li> <li>Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</li> </ul>

### Technical specifications

Article number	<b>6AG1132-6BH01-7BA0</b>	<b>6AG1132-6BF00-7CA0</b>	<b>6AG1132-6GD51-7BA0</b>
Based on	<b>6ES7132-6BH01-0BA0</b> SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	<b>6ES7132-6BF00-0CA0</b> SIPLUS ET 200SP DQ 8x24VDC/0,5A HF	<b>6ES7132-6GD51-0BA0</b> SIPLUS ET 200SP RQ 4x24VDC/2A CO ST
<b>Usage in industrial process technology</b>	<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3 (excluding trichlorethylene)</li> <li>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 3 (excluding trichlorethylene)</li> <li>Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)</li> </ul>
<b>Remark</b>	<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	<ul style="list-style-type: none"> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> </ul>	<ul style="list-style-type: none"> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> </ul>
<b>Conformal coating</b>	<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Class 2 for high reliability</li> <li>Yes; Type 1 protection</li> <li>Yes; Discoloration of coating possible during service life</li> <li>Yes; Conformal coating, Class A</li> </ul>
Article number	<b>6AG1132-6HD01-7BB1</b>	<b>6AG1132-6BD20-7CA0</b>	<b>6AG1132-6FD00-7CU0</b>
Based on	<b>6ES7132-6HD01-0BB1</b> SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	<b>6ES7132-6BD20-0CA0</b> SIPLUS ET 200SP DQ 4x24VDC/2A HF	<b>6ES7132-6FD00-0CU0</b> SIPLUS ET 200SP DQ 4x24..230VAC/2A HF
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin (incl. condensation/frost)</li> <li>70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax &gt; 60 °C max. continuous current of 3 A per relay</li> <li>-40 °C; in all other mounting positions</li> <li>50 °C; in all other mounting positions</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin (incl. condensation/frost)</li> <li>70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax &gt; 60 °C max. total current 1 A</li> </ul>	<ul style="list-style-type: none"> <li>-40 °C; = Tmin (incl. condensation/frost)</li> <li>70 °C; = Tmax</li> </ul>
<b>Altitude during operation relating to sea level</b>			
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	<ul style="list-style-type: none"> <li>3 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)</li> </ul>	<ul style="list-style-type: none"> <li>5 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)</li> </ul>	<ul style="list-style-type: none"> <li>2 000 m</li> <li>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)</li> </ul>
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	<ul style="list-style-type: none"> <li>100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)</li> </ul>	<ul style="list-style-type: none"> <li>100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation</li> </ul>	<ul style="list-style-type: none"> <li>100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation</li> </ul>
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Incl. diesel and oil droplets in the air</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Incl. diesel and oil droplets in the air</li> </ul>	<ul style="list-style-type: none"> <li>Yes; Incl. diesel and oil droplets in the air</li> </ul>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > SIPLUS digital outputs****Technical specifications**

Article number	<b>6AG1132-6HD01-7BB1</b>	<b>6AG1132-6BD20-7CA0</b>	<b>6AG1132-6FD00-7CU0</b>
Based on	<b>6ES7132-6HD01-0BB1</b> SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	<b>6ES7132-6BD20-0CA0</b> SIPLUS ET 200SP DQ 4X24VDC/2A HF	<b>6ES7132-6FD00-0CU0</b> SIPLUS ET 200SP DQ 4X24..230VAC/2A HF
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Overview



- 2, 4 and 8-channel AI modules
- Measuring ranges for current, voltage, thermocouples, resistance thermometer, resistor and PTC
- BaseUnits for 2, 3 and 4-conductor connection
- Function classes Basic, Standard, High Feature and High Speed
- Clear labeling on front of module
- LEDs for diagnostics, status and errors
- Individual system-integrated load group formation with self-assembling potential multi-terminal busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
  - Labeling strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shielding terminal

## Overview of SIPLUS analog input modules

Analog input	PU	Article No.	CC code	BU type
AI 8 x I 2/4-wire BA	1	6AG1134-6GF00-7AA1	CC01	A0, A1
AI 8 x U BA	1	6AG1134-6FF00-2AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6AG1134-6HD01-7BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	1	6AG1134-6GD01-7BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6AG1134-6TD00-2CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6AG1134-6HB00-2CA1	CC05	A0, A1
AI 2xU/I 2/4-wire HS	1	6AG1134-6HB00-2DA1	CC00	A0, A1
With two operating modes: • High-speed isochronous AI • Oversampling				
AI 8 x RTD/TC 2-wire HF	1	6AG1134-6JF00-2CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	1	6AG1134-6JD00-2CA1	CC00	A0, A1
AI Energy Meter 480 V AC ST	1	6AG1134-6PA20-7BD0	--	D0

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > SIPLUS analog inputs****Ordering data****SIPLUS analog input modules**

(Extended temperature range and exposure to environmental substances)

Analog input module  
AI 8xI 2/4-wire BA, BU type A0 or A1, color code CC01**6AG1134-6GF00-7AA1**Analog input module  
AI 8xU BA, BU type A0 or A1, color code CC02**6AG1134-6FF00-2AA1**Analog input module  
AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%**6AG1134-6HD01-7BA1**Analog input module  
AI 4xI 2-/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%**6AG1134-6GD01-7BA1**Analog input module  
AI 4xRTD/TC 2-, 3-, 4-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range**6AG1134-6JD00-2CA1**Analog input module  
AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03**6AG1134-6TD00-2CA1**Analog input module  
AI 2xU/I 2/4-wire High Feature, BU type A0 or A1, color code CC05, 16-bit, ±0.1%, independent channel isolation, isochronous mode above 1 ms**6AG1134-6HB00-2CA1**

Analog input module AI 2xU/I 2-/4-wire High Speed, BU type A0 or A1, color code CC00, 16-bit, ±0.3%, isochronous mode above 250 µs, oversampling above 50 µs

**6AG1134-6HB00-2DA1**Analog input module  
AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range**6AG1134-6JF00-2CA1**Analog input module  
AI Energy Meter Standard, 480 V AC, BU type D0**6AG1134-6PA20-7BD0****Usable SIPLUS BaseUnits type A0****BU15-P16+A0+2D**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**6AG1193-6BP00-7DA0****BU15-P16+A0+2B**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**6AG1193-6BP00-7BA0****BU15-P16+A10+2D**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

**6AG1193-6BP20-7DA0****BU15-P16+A10+2B**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

**6AG1193-6BP20-7BA0****Usable SIPLUS BaseUnits type A1 (temperature detection)****BU15-P16+A0+2D/T**

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**6AG1193-6BP00-7DA1****BU15-P16+A0+2B/T**

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**6AG1193-6BP00-7BA1****BU15-P16+A0+12D/T**

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and also 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)

**6AG1193-6BP40-7DA1****BU15-P16+A0+12B/T**

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and also 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group

**6AG1193-6BP40-7BA1****Usable SIPLUS BaseUnits type D0****BU20-P12+A0+0B**

(Extended temperature range and exposure to environmental substances)

BU type D0; BaseUnit with 12 push-in terminals, without AUX terminals, bridged to the left

**6AG1193-6BP00-7BD0****Accessories****SIPLUS Mounting Kit ET 200SP**

Mounting accessories for use with increased mechanical vibration and shock loads.

**6AG1193-6AA00-0AA0****Other accessories**

See SIMATIC ET 200SP, analog input modules, page 10/54

#### Technical specifications

Article number	6AG1134-6GF00-7AA1	6AG1134-6FF00-2AA1	6AG1134-6HD01-7BA1	6AG1134-6GD01-7BA1	6AG1134-6TD00-2CA1
Based on	6ES7134-6GF00-0AA1 SIPLUS ET 200SP AI 8XI 2-/4-WIRE BA	6ES7134-6FF00-0AA1 SIPLUS ET 200SP AI 8xU BASIC	6ES7134-6HD01-0BA1 SIPLUS ET 200SP AI 4xU/I 2-w ST	6ES7134-6GD01-0BA1 SIPLUS ET 200SP AI 4xI 2-/4-w ST	6ES7134-6TD00-0CA1 SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -30 °C
• horizontal installation, max.	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > 60 °C max. 1x ±20 mA or 4x ±10 V permissible	70 °C; = Tmax; > 60 °C max. 1x ±20 mA permissible	60 °C; = Tmax
• vertical installation, min.			-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost); start-up @ -30 °C
• vertical installation, max.			50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>					
<b>Coolants and lubricants</b>					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > SIPLUS analog inputs

#### Technical specifications

Article number	6AG1134-6GF00-7AA1	6AG1134-6FF00-2AA1	6AG1134-6HD01-7BA1	6AG1134-6GD01-7BA1	6AG1134-6TD00-2CA1
Based on	6ES7134-6GF00-0AA1	6ES7134-6FF00-0AA1	6ES7134-6HD01-0BA1	6ES7134-6GD01-0BA1	6ES7134-6TD00-0CA1
	SIPLUS ET 200SP AI 8X1 2-/4-WIRE BA	SIPLUS ET 200SP AI 8xU BASIC	SIPLUS ET 200SP AI 4xU/I 2-w ST	SIPLUS ET 200SP AI 4x1 2-/4-w ST	SIPLUS ET 200SP AI 4X1 2-WIRE 4...20MA H
<b>Usage in industrial process technology</b>					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6JD00-2CA1	
Based on	6ES7134-6HB00-0CA1	6ES7134-6HB00-0DA1	6ES7134-6JF00-0CA1	6ES7134-6JD00-0CA1	
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 4xRTD/TC HF	
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -30 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	
• horizontal installation, max.	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module	
• vertical installation, min.			-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	
• vertical installation, max.			50 °C; = Tmax	50 °C; = Tmax	
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	
<b>Relative humidity</b>					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	



### Technical specifications

Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6JD00-2CA1
Based on	6ES7134-6HB00-0CA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6HB00-0DA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6JF00-0CA1 SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	6ES7134-6JD00-0CA1 SIPLUS ET 200SP AI 4xRTD/TC HF
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > SIPLUS analog inputs

#### Technical specifications

Article number	<b>6AG1134-6PA20-7BD0</b>
Based on	<b>6ES7134-6PA20-0BD0</b> SIPLUS ET 200SP AI EMETER 480VAC ST
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin; < -25 °C min. permissible supply voltage 110 V AC
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. permissible current 1 A per phase
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	<b>6AG1134-6PA20-7BD0</b>
Based on	<b>6ES7134-6PA20-0BD0</b> SIPLUS ET 200SP AI EMETER 480VAC ST
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview



- 2 and 4-channel analog output (AQ) modules

For different requirements, the digital output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distribution modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)

- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - Oversampling operating mode (n-fold equidistant output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
  - Isochronous mode (simultaneous equidistant output of analog values)
  - Output of substitute value in the event of interruptions to communication (shutdown, output adjustable substitute value, or keep last value)
  - Calibration during runtime
  - Re-parameterization during operation
  - Firmware update
  - Diagnosis of wire break, short circuit, overflow, underflow
  - Value status (optional binary validity information of the analog signal in the process image)
  - Supports the PROFlenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

## Overview of analog output modules

Analog output	PU	Article No.	CC code	BU type
AQ 2 x I ST	1	6AG1135-6GB00-7BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6AG1135-6HD00-7BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6AG1135-6HB00-7CA1	CC00	A0, A1
AQ 2xU/I HS	1	6AG1135-6HB00-2DA1	CC00	A0, A1

With two operating modes:

- High-speed isochronous AQ
- Oversampling

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > SIPLUS analog outputs**

Ordering data	Article No.	Article No.	
<b>SIPLUS analog output modules</b> (Extended temperature range and exposure to environmental substances)			
Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit	<b>6AG1135-6GB00-7BA1</b>		
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC03	<b>6AG1135-6HD00-7BA1</b>		
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%	<b>6AG1135-6HB00-7CA1</b>		
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16-bit, ± 0.3%	<b>6AG1135-6HB00-2DA1</b>		
<b>Usable SIPLUS BaseUnits type A0</b>			
<b>BU15-P16+A0+2D</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA0</b>		
<b>BU15-P16+A0+2B</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA0</b>		
<b>BU15-P16+A10+2D</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	<b>6AG1193-6BP20-7DA0</b>		
<b>BU15-P16+A10+2B</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	<b>6AG1193-6BP20-7BA0</b>		
		<b>Usable SIPLUS BaseUnits type A1 (temperature detection)</b>	
		<b>BU15-P16+A0+2D/T</b> (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA1</b>
		<b>BU15-P16+A0+2B/T</b> (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA1</b>
		<b>BU15-P16+A0+12D/T</b> (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and also 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	<b>6AG1193-6BP40-7DA1</b>
		<b>BU15-P16+A0+12B/T</b> (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and also 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	<b>6AG1193-6BP40-7BA1</b>
		<b>Accessories</b>	
		<b>SIPLUS Mounting Kit ET 200SP</b> Mounting accessories for use with increased mechanical vibration and shock loads.	<b>6AG1193-6AA00-0AA0</b>
		<b>Other accessories</b>	See SIMATIC ET 200SP, analog output modules, page 10/37

**Technical specifications**

Article number	<b>6AG1135-6HD00-7BA1</b>	<b>6AG1135-6GB00-7BA1</b>	<b>6AG1135-6HB00-2DA1</b>	<b>6AG1135-6HB00-7CA1</b>
Based on	<b>6ES7135-6HD00-0BA1</b> SIPLUS ET 200SP AQ 4xU/I ST	<b>6ES7135-6GB00-0BA1</b> SIPLUS ET 200SP AQ 2xI STANDARD	<b>6ES7135-6HB00-0DA1</b> SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	<b>6ES7135-6HB00-0CA1</b> SIPLUS ET 200SP AQ 2xU/I HF
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 2x ±10 V permissible	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin			-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax			60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > SIPLUS analog outputs****Technical specifications**

Article number	<b>6AG1135-6HD00-7BA1</b>	<b>6AG1135-6GB00-7BA1</b>	<b>6AG1135-6HB00-2DA1</b>	<b>6AG1135-6HB00-7CA1</b>
Based on	<b>6ES7135-6HD00-0BA1</b> SIPLUS ET 200SP AQ 4xU/I ST	<b>6ES7135-6GB00-0BA1</b> SIPLUS ET 200SP AQ 2xI STANDARD	<b>6ES7135-6HB00-0DA1</b> SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	<b>6ES7135-6HB00-0CA1</b> SIPLUS ET 200SP AQ 2xU/I HF
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

## Overview



## Technical properties

- Counter module for ET 200SP
- Interfaces:
  - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
  - 24 V encoder supply output, short-circuit proof
  - 3 digital inputs for controlling the count operation, for saving or for setting the count value
  - 2 digital outputs for fast reactions regardless of the counter status or measured value

- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31-bit
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

## Supported types of encoders/signals

- 24 V incremental encoder with and without N signal
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

## Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

## Ordering data

## TM Count 1x24V counter module

With one channel, max. 200 kHz; for 24 V encoder

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

## Article No.

6ES7138-6AA01-0BA0  
6ES7138-6AA01-2BA0

## Suitable BaseUnits

## BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP20-0DA0  
6ES7193-6BP20-2DA0

## BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0DA0  
6ES7193-6BP00-2DA0

## Article No.

## 2BU15-P16+A0+2DB

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit

6ES7193-6BP60-0DA0

## BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP20-0BA0  
6ES7193-6BP20-2BA0

## BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0BA0  
6ES7193-6BP00-2BA0

## 2BU15-P16+A0+2B

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit

6ES7193-6BP60-0BA0

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; Technology modules &gt; TM Count 1x24V counter module

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>Equipment labeling plate</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>	<b>6ES7193-6CP71-2AA0</b>
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	<b>6ES7193-6CP72-2AA0</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	<b>6ES7193-6CP73-2AA0</b>
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>	
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>	
<b>BU cover</b> For covering empty slots (gaps); 5 units		
• 15 mm wide	<b>6ES7133-6CV15-1AM0</b>	
• 20 mm wide	<b>6ES7133-6CV20-1AM0</b>	
<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>	
		<b>Color-coded labels</b>
		• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
		• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
		• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units
		<b>Mechanical coding elements</b>
		For automatic coding of I/O modules; spare part. 20 units
		Type A
		Type B
		Type C
		Type D
		<b>6ES7193-6KA00-3AA0</b>
		<b>6ES7193-6KB00-3AA0</b>
		<b>6ES7193-6KC00-3AA0</b>
		<b>6ES7193-6KD00-3AA0</b>

**Technical specifications**

Article number	<b>6ES7138-6AA01-0BA0</b> ET 200SP, TM Count 1x24V
<b>General information</b>	
Product type designation	TM Count 1x24V
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15 SP1 or higher
• STEP 7 configurable/integrated from version	V5.6 and higher
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	1
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA
<b>Digital inputs</b>	
Number of digital inputs	3
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	<b>6ES7138-6AA01-0BA0</b> ET 200SP, TM Count 1x24V
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
<b>for technological functions</b>	
- parameterizable	Yes
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes



### Technical specifications

Article number	<b>6ES7138-6AA01-0BA0</b> ET 200SP, TM Count 1x24V
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per module, max.	1 A
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
<b>Encoder signal 24 V</b>	
- permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
- permissible voltage at input, max.	30 V
<b>Interface types</b>	
• Source/sink input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	<b>6ES7138-6AA01-0BA0</b> ET 200SP, TM Count 1x24V
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	Yes; Parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator forward counting (green)	Yes
• Status indicator backward counting (green)	Yes
<b>Integrated Functions</b>	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
<b>Counting functions</b>	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; Technology modules &gt; TM Count 1x24V counter module

**Technical specifications**

Article number	<b>6ES7138-6AA01-0BA0</b> ET 200SP, TM Count 1x24V
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	No

Article number	<b>6ES7138-6AA01-0BA0</b> ET 200SP, TM Count 1x24V
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	45 g

## Overview

**Technical properties**

- Counter and position detection module for ET 200SP
- Interfaces:
  - Encoder signals A, B and N for 5 V TTL or RS 422 differential signals
  - SSI interface with clock and data for RS 422 differential signals
  - 24 V encoder supply output, short-circuit proof
  - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
  - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value

- Counter frequency 1 MHz (4 MHz with four-fold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

**Supported types of encoders/signals**

- Incremental encoders with or without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

**Supported system functions**

- Isochronous mode
- Firmware update
- Identification data (I&M)

**Ordering data****Article No.****Article No.****TM PosInput 1 counter and position detection module**

With one channel, max. 1 MHz for 5 V TTL or RS422 differential signals or SSI absolute encoder

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7138-6BA01-0BA0**  
**6ES7138-6BA01-2BA0**

**Suitable BaseUnits****BU15-P16+A10+2D**

BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0**

**BU15-P16+A0+2D**

BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

**2BU15-P16+A0+2DB**

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit

**6ES7193-6BP60-0DA0**

**BU15-P16+A10+2B**

BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0**

**BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0**

**2BU15-P16+A0+2B**

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit

**6ES7193-6BP60-0BA0**

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > TM PosInput 1 counter and position detection module

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>Equipment labeling plate</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>	<b>6ES7193-6CP71-2AA0</b>
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	<b>6ES7193-6CP72-2AA0</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	<b>6ES7193-6CP73-2AA0</b>
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>	
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>	
<b>BU cover</b> For covering empty slots (gaps); 5 units		
• 15 mm wide	<b>6ES7133-6CV15-1AM0</b>	
• 20 mm wide	<b>6ES7133-6CV20-1AM0</b>	
<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>	
		<b>Color-coded labels</b>
		• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
		• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
		• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units
		<b>Mechanical coding elements</b>
		For automatic coding of I/O modules; spare part. 20 units
		Type A
		Type B
		Type C
		Type D

## Technical specifications

Article number	<b>6ES7138-6BA01-0BA0</b> ET 200SP, TM Posinput 1
<b>General information</b>	
Product type designation	TM PosInput 1
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher
• STEP 7 configurable/integrated from version	V5.6 (use previous version *6BA00*)
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	2
<b>5 V encoder supply</b>	
• 5 V	Yes
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA; Total current of all encoders
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA; Total current of all encoders
<b>Digital inputs</b>	
Number of digital inputs	2
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	<b>6ES7138-6BA01-0BA0</b> ET 200SP, TM Posinput 1
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
<b>for technological functions</b>	
- parameterizable	Yes

### Technical specifications

Article number	<b>6ES7138-6BA01-0BA0</b> ET 200SP, TM Posinput 1
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per module, max.	1 A
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes

Article number	<b>6ES7138-6BA01-0BA0</b> ET 200SP, TM Posinput 1
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max.; 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 μs & automatic
• Multiturn	Yes
• Singleturn	Yes
<b>Interface types</b>	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	Yes; Parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
• Group error	Yes

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; Technology modules &gt; TM PosInput 1 counter and position detection module

**Technical specifications**

Article number	<b>6ES7138-6BA01-0BA0</b> ET 200SP, TM Posinput 1
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator forward counting (green)	Yes
• Status indicator backward counting (green)	Yes
<b>Integrated Functions</b>	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	Yes
<b>Counting functions</b>	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	<b>6ES7138-6BA01-0BA0</b> ET 200SP, TM Posinput 1
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	No
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	45 g

## Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with  $\mu\text{s}$  accuracy
- Outputs for outputting the switching signals with  $\mu\text{s}$  accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>TM Timer DIDQ 10x24V time-based IO module</b> 4 time-controlled inputs, 6 time-controlled outputs	<b>6ES7138-6CG00-0BA0</b>	<b>BU15-P16+A0+2B</b> BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>
<b>Suitable BaseUnits</b>		<b>2BU15-P16+A0+2B</b> Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group • Pack of 1 unit	
<b>BU15-P16+A10+2D</b> BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP20-0DA0</b> <b>6ES7193-6BP20-2DA0</b>	<b>Accessories</b>	
<b>BU15-P16+A0+2D</b> BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP00-2DA0</b>	<b>Equipment labeling plate</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>
<b>2BU15-P16+A0+2DB</b> Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) • Pack of 1 unit	<b>6ES7193-6BP60-0DA0</b>	<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer  500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer  1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer  1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LR10-0AA0</b>  <b>6ES7193-6LR10-0AG0</b>  <b>6ES7193-6LA10-0AA0</b>  <b>6ES7193-6LA10-0AG0</b>
<b>BU15-P16+A10+2B</b> BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP20-0BA0</b> <b>6ES7193-6BP20-2BA0</b>	<b>BU cover</b> For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	<b>6ES7133-6CV15-1AM0</b> <b>6ES7133-6CV20-1AM0</b>
		<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > TM Timer DIDQ 10x24V time-based IO module

### Ordering data

#### Color-coded labels

- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units

### Article No.

6ES7193-6CP71-2AA0

6ES7193-6CP72-2AA0

6ES7193-6CP73-2AA0

### Article No.

#### Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A

Type B

Type C

Type D

6ES7193-6KA00-3AA0

6ES7193-6KB00-3AA0

6ES7193-6KC00-3AA0

6ES7193-6KD00-3AA0

### Technical specifications

Article number	<b>6ES7138-6CG00-0BA0</b> ET 200SP, TM Timer DIDQ 10x24V
<b>General information</b>	
Product type designation	TM Timer DIDQ 10x24V
<b>Product function</b>	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	V13 Update 3
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
<b>Encoder supply</b>	
Number of outputs	1
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	500 mA; Observe derating
<b>Digital inputs</b>	
Number of digital inputs	4
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Digital input with time stamp	Yes
- Number, max.	4
• Counter	Yes
- Number, max.	3
• Counter for incremental encoder	Yes
- Number, max.	1
• Digital input with oversampling	Yes
- Number, max.	4
• HW enable for digital input	Yes
- Number, max.	1
• HW enable for digital output	Yes
- Number, max.	3

Article number	<b>6ES7138-6CG00-0BA0</b> ET 200SP, TM Timer DIDQ 10x24V
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage)</b>	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
<b>for standard inputs</b>	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
- at "0" to "1", min.	4 µs
- at "1" to "0", min.	4 µs
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	6
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
<b>Digital output functions, parameterizable</b>	
• Digital output with time stamp	Yes
- Number, max.	6
• PWM output	Yes
- Number, max.	6
• Digital output with oversampling	Yes
- Number, max.	6
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
<b>Load resistance range</b>	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ



## Technical specifications

Article number	<b>6ES7138-6CG00-0BA0</b> ET 200SP, TM Timer DIDQ 10x24V
<b>Output voltage</b>	DC
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per module, max.	3.5 A; Observe derating
<b>Connectable encoders</b>	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• pulse encoder	Yes
<b>Encoder signal 24 V</b>	
- permissible voltage at input, min.	-30 V
- permissible voltage at input, max.	30 V
<b>Interface types</b>	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Isochronous mode</b>	
Bus cycle time (TDP), min.	375 µs

Article number	<b>6ES7138-6CG00-0BA0</b> ET 200SP, TM Timer DIDQ 10x24V
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
<b>Integrated Functions</b>	
Counter	Yes
• Number of counters	3
• Counting frequency, max.	200 kHz; with quadruple evaluation
<b>Counting functions</b>	
• Continuous counting	Yes
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	No
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
<b>Decentralized operation</b>	
to SIMATIC S7-1500	Yes
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	45 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > TM Pulse 2x24V pulse output module

### Overview



2-channel pulse output module for ET 200SP

- Operating modes:
  - Single pulse with defined length
  - Pulse chain with defined number of pulses
  - Pulse width modulation (with flexible ON period, optional current control and dither function)
  - PWM signal for controlling a DC motor
  - ON and OFF delay; rising and falling edge can be delayed separately to the microsecond
  - Frequency output with defined output frequency
- Hardware:
  - 2 channels 24 V, 2 A output current
  - Parallel switching for enhanced performance on 4 A output current
  - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
  - Push-pull output driver for especially steep edges at the outputs
  - Polarity change in DC motor operation for direction reversal
  - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 µs
- Channel functions:
  - HW enable; start of signal output with the onboard digital input
  - Parameterizable ON delay; for precise deceleration between the HW enable and the start of output
  - Current measurement in the operating modes pulse-width modulation and pulse chain; enables control of the output current mean value over a period. This allows you to compensate for the effect of temperature on the actuator resistance.
  - Cyclic control of the respective main setpoint from the PLC in every operating mode; other values can be modified flexibly from the user program.
- Supported system functions:
  - Isochronous mode; enables precision-timed connection of the setpoint output to a higher-level controller
  - Firmware update
  - Identification data I&M

### Ordering data

### Article No.

#### TM Pulse 2x24V pulse output module

PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors

6ES7138-6DB00-0BB1

#### Suitable BaseUnits

#### BU20-P12+A0+4B

BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group

6ES7193-6BP20-0BB1

#### Accessories

#### Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

#### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0

#### BU cover

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

6ES7133-6CV15-1AM0

6ES7133-6CV20-1AM0

#### Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A

6ES7193-6KA00-3AA0

Type B

6ES7193-6KB00-3AA0

Type C

6ES7193-6KC00-3AA0

Type D

6ES7193-6KD00-3AA0

### Technical specifications

Article number	<b>6ES7138-6DB00-0BB1</b> ET 200SP, TM Pulse 2x24V
<b>General information</b>	
Product type designation	TM Pulse 2x24 V
<b>Product function</b>	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 + HSP
• STEP 7 configurable/integrated from version	V5.5 SP4 and higher
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.31
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
<b>Encoder supply</b>	
Number of outputs	2; A common 24V encoder supply for both channels
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	300 mA
<b>Digital inputs</b>	
Number of digital inputs	2; 1 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Freely usable digital input	Yes
• HW enable for digital output	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	4 µs; for parameterization "none"
- at "1" to "0", min.	4 µs; for parameterization "none"

Article number	<b>6ES7138-6DB00-0BB1</b> ET 200SP, TM Pulse 2x24V
<b>Digital outputs</b>	
Type of digital output	P- and M-switching
Number of digital outputs	2; 1 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Freely usable digital output	Yes
• PWM output	Yes
- Number, max.	2; 1 per channel
- Cycle duration, parameterizable	Yes; Max. 85 s
• Connection of a proportional valve	Yes
• Dithering	Yes
• Current measurement	Yes
• Current control	Yes
• Connection of a DC motor	Yes
• ON-delay	Yes
• OFF-delay	Yes
• Frequency output	Yes
• Pulse train	Yes
• Pulse output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	2 A
• on lamp load, max.	10 W; 1 W with High Speed output
<b>Load resistance range</b>	
• lower limit	12 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "0", max.	1 V
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	2 A; 0.1 A with High Speed output, observe derating
<b>Output delay with resistive load</b>	
• "0" to "1", typ.	0 µs; With High Speed output, 4.5 µs with Standard output
• "0" to "1", max.	0.8 µs; With High Speed output, 9 µs with Standard output
• "1" to "0", typ.	0 µs; With High Speed output, 4.5 µs with Standard output
• "1" to "0", max.	0.8 µs; With High Speed output, 9 µs with Standard output
<b>Parallel switching of two outputs</b>	
• for uprating	Yes

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; Technology modules &gt; TM Pulse 2x24V pulse output module

**Technical specifications**

Article number	<b>6ES7138-6DB00-0BB1</b> ET 200SP, TM Pulse 2x24V
<b>Switching frequency</b>	
• with resistive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• with inductive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per channel, max.	2 A
• Current per group, max.	4 A
• Current per module, max.	4 A
<b>Isochronous mode</b>	
Bus cycle time (TDP), min.	250 µs; with 1 channel configuration, 375 µs with 2 channel configuration
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes; Parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
<b>Integrated Functions</b>	
Counter	No
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	No

Article number	<b>6ES7138-6DB00-0BB1</b> ET 200SP, TM Pulse 2x24V
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	50 g

## Overview



The TM StepDrive module from Phytron is a high-precision stepper motor control with integrated power output stage for use in the SIMATIC ET 200SP distributed I/O system. It is the 1-step-drive successor model for SIMATIC ET 200S.

The module can be used together with system and I/O components of the ET 200SP distributed I/O system. Operation is possible with the following head modules:

- IM PROFIBUS
- IM PROFINET
- ET 200SP CPU

Corresponding GSD files and an HSP are available.

The ET 200SP TM StepDrive 24...48V/5A is a product of our Phytron GmbH product partner and is only available from the Phytron GmbH company.

**Note**

Product partners are external companies outside Siemens AG and its associated companies. Information about and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the respective product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners.

## Ordering data

## Article No.

**TM StepDrive stepper motor control**

More information and ordering options via Phytron (company):  
<http://www.phytron.com/tm-stepdrive>

High-precision stepper motor control for ET 200SP

**Suitable BaseUnits****BU20-P12+A0+4B****6ES7193-6BP20-0BB1**

BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group

**Accessories****Mechanical coding elements**

For automatic coding of I/O modules; spare part. 20 units

Type A

**6ES7193-6KA00-3AA0**

Type B

**6ES7193-6KB00-3AA0**

Type C

**6ES7193-6KC00-3AA0**

Type D

**6ES7193-6KD00-3AA0**

## Technical specifications

- Suitable for bipolar control of 2-phase stepper motors of 4-, (6-) or 8-wire design (in 4-wire system)
- 5 A peak phase current with adjustable current steps
- Supply voltage from 24 to 48 V DC
- Up to 1/256 microstep (physical resolution: approx. 51 200 positions per revolution (0.007°/step)).
- Maximum stepping rate: 250 000 steps/s
- 2 digital inputs for limit and reference switches
- Diagnostics LEDs (overcurrent, overtemperature, traversing task or motor running ...)
- Short-circuit-proof, overload-proof
- Data record transfer for power output stage parameter assignment and diagnostics during runtime
- Overdrive: Current adaptation for higher clock frequencies
- Booster: Enhanced torque during acceleration or braking
- Adjustable response to CPU stop

## More information

You can find more information about the module as well as contact information at:

<http://www.phytron.com/tm-stepdrive>

Here you will also find the manual, the data sheet, the HSP, a link to the GSD files as well as sample function blocks for SIMATIC.

Service and support:

<http://www.phytron.com/support>

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

### Overview

SIPLUS and SIMATIC Electrical Charge Controller (SECC) are the key components in infrastructure solutions for the conductive charging of electric vehicles.

They perform the following functions:

- Detection of the charging cable and its permissible current carrying capacity
- Transfer of the maximum charging current from the charging station to the electric vehicle
- Evaluation of the status signals from the electric vehicle:
  - Ready for charging
  - Charging
  - Charging with ventilation
- Cost-optimized, space-saving charging infrastructure solutions due to compact design based on SIMATIC ET 200SP.

#### ET 200SP TM ECC 2xPWM ST AC module



- Control of charging outputs according to IEC 61851 by parameterizable SIMATIC ET 200SP TM ECC 2xPWM ST charging controller
- Control of load tap-off
- Control of connector lock
- Evaluation of connector lock or load contactor status

#### ET 200SP TM ECC PL ST DC module



- The SIMATIC ET 200SP TM ECC PL ST charging controller fully controls a DC charging process according to DIN SPEC 70121.
- The following sequences are performed:
  - Session Setup
  - Service Discovery
  - Service and Payment Selection
  - Contract Authentication
  - Charge Parameter Discovery
  - Power Delivery
  - Charging Status
  - Cable Check
  - Pre Charging
  - Current Demand
  - Welding Detection
  - Session Stop

#### Accessories: Calibration Kit TM ECC CCS2

Expansion kit for calibration of the power line signal strength of an EVSE.

- According to DIN SPEC 70121 / ISO15118 or design guidelines for CCS charging stations Type 2
- Suitable for the SIMATIC ET 200SP TM ECC PL ST technology module

Ordering data	Article No.	Article No.
<b>Charging controller SIMATIC ET 200SP TM ECC 2xPWM ST</b>  Designed for controlling charging outputs according to IEC 61851 and parameterizable, with 2 charging outputs, ambient temperature -30 °C ... 60° C  2x control pilot, 2x plug present, 2x DQ switching contact for load contactor as open collector, 2x DI for load contactor feedback or connector lock;  2x ACT for connector lock suitable for BU type BU20-P12+A0+4B and BU20-P12+A4+0B  With conformal coating, based on 6FE1242-6TM10-0BB1.	<b>6FE1242-6TM10-0BB1</b>	<b>Technology module SIMATIC ET 200SP TM ECC PL ST</b>  Charging controller for the conductive charging of electric vehicles according to DIN SPEC 70121, charging mode 4, ambient temperature -30 °C ... 60 °C  1x control pilot including Powerline Green Phy, 1x plug present/proximity pilot, 1x digital out TRIP function as open collector, 1x digital out (DQ P) as open collector, suitable for BU type BU20-P12+A0+4B or BU type BU20-P12+A4+0B
	<b>6FE1242-6TM10-2BB1</b>	<b>6FE1244-0AD10-0AA0</b>  <b>Expansion kit SIMATIC Calibration Kit TM ECC CCS2</b>  Expansion kit for calibration of the power line signal strength of an EVSE according to DIN SPEC 70121 / ISO15118 or design guidelines for CCS charging stations.  Suitable for 6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST

### Technical specifications

Article number	6FE1242-6TM10-0BB1	6AG1242-6TM10-2BB1	6FE1242-6TM20-0BB1
	SIMATIC ET 200SP TM ECC 2xPWM ST	SIPLUS ET 200SP TM ECC 2xPWM ST	SIMATIC ET 200SP TM ECC PL ST
<b>General information</b>			
Product type designation	ECC 2x PWM ST		ECC PL ST
Product description	Technology modules for the conductive AC charging of electric vehicles according to IEC 61851	Communication controller for controlling conductive AC charging according to IEC 61851	Technology module for the conductive charging of electric vehicles according to DIN 70121
usable BaseUnits	BU type B0, B1		
Color code for module-specific color identification plate		CC40	
Number of channels	2; Acc. to IEC 61851-1 Mode 3 and/or SAE J1772	2; According to IEC 61851/SAE J1772	1; Acc. to IEC 61851-1 Mode 4 and DIN SPEC 70121
<b>Product function</b>			
• I&M data	Yes; I&M0 to I&M3		
• Isochronous mode	No		
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/ integrated from version	V14 SP1		STEP 7 V15.1 or higher
<b>Installation type/mounting</b>			
Mounting type	standard rail		
Mounting position	Horizontal		Horizontal, vertical
<b>Supply voltage</b>			
Type of supply voltage	DC		
Rated value (DC)	24 V		
Reverse polarity protection	Yes; against destruction		
<b>Load voltage L+</b>			
• Rated value (DC)	24 V		24 V
• Reverse polarity protection			Yes
<b>Input current</b>			
Current consumption, typ.	40 mA		
Current consumption, max.	90 mA		100 mA

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules &gt; Technology modules &gt; SIMATIC ET 200SP ECC charging controllers

**Technical specifications**

Article number	<b>6FE1242-6TM10-0BB1</b> SIMATIC ET 200SP TM ECC 2xPWM ST	<b>6AG1242-6TM10-2BB1</b> SIPLUS ET 200SP TM ECC 2xPWM ST	<b>6FE1242-6TM20-0BB1</b> SIMATIC ET 200SP TM ECC PL ST
<b>Digital inputs</b>			
Number of digital inputs	2; 1 per channel		0
Digital inputs, parameterizable	Yes; 12 V / 24 V		No
<b>Digital input functions, parameterizable</b>			
• Freely usable digital input	No; Readback contact contactor / connector lock		
<b>Input voltage</b>			
• Type of input voltage	DC		
• for signal "0"	<0.2 V (nom)		
• for signal "1"	>0.6 V (nom)		
• permissible voltage at input, min.	0 V		
• permissible voltage at input, max.	30 V		
<b>Cable length</b>			
• shielded, max.			10 m
• unshielded, max.	30 m		
<b>Digital outputs</b>			
Type of digital output	Transistor		
Number of digital outputs	2; 1 per channel		2; 1x digital out TRIP function as open collector, 1x digital out (DQ P) as open collector
Current-sinking			Yes
short-circuit proof	Yes		
Short-circuit protection	Yes; electronic/thermal		
<b>Digital output functions, parameterizable</b>			
• PWM output	Yes; According to IEC 61851		Yes; Acc. to DIN SPEC 70121
- Number, max.	2; 1 per channel		1; 1 per channel
• Connection of a DC motor	Yes; ACT p/n connector locking		No; Only fixed charging cables are permitted for DC charging systems
<b>Switching capacity of the outputs</b>			
• with resistive load, max.	1.3 A		0.6 A; Per digital output
<b>Output voltage</b>			
• Type of output voltage	DC		
• Rated value (DC)	24 V		
<b>Cable length</b>			
• unshielded, max.	30 m		10 m
<b>Analog outputs</b>			
Number of analog outputs	2; Control pilot acc. to IEC 61851-1 and/or SAE J1772		1
Type of analog output			Control pilot including Powerline Green Phy, acc. to DIN SPEC 70121
Connection of a DC motor	Yes; Motor for connector lock		No
<b>Protocols</b>			
Bus communication	Yes		Yes; Backplane bus
Vehicle communication according to IEC 61851	Yes; MODE 3		Yes; Mode 4
<b>Interrupts/diagnostics/status information</b>			
<b>Alarms</b>			
• Diagnostic alarm	Yes		
<b>Diagnoses</b>			
• Monitoring the supply voltage	No		No; Supply voltage diagnostics
• Wire-break			No
• Short-circuit	Yes		No



## Technical specifications

Article number	6FE1242-6TM10-0BB1	6AG1242-6TM10-2BB1	6FE1242-6TM20-0BB1
	SIMATIC ET 200SP TM ECC 2xPWM ST	SIPLUS ET 200SP TM ECC 2xPWM ST	SIMATIC ET 200SP TM ECC PL ST
<b>Diagnostics indication LED</b>			
• ERROR LED	Yes; red LED		No
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED		
• Channel status display	Yes; green LED		
• for module diagnostics	Yes; green/red DIAG LED		
<b>Potential separation</b>			
<b>Potential separation channels</b>			
• between the channels	No		No; Only one channel is available
• between the channels and backplane bus	Yes		
<b>EMC</b>			
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge		
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)		
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV signal lines		
Conducted interference due to surge acc. to IEC 61000-4-5	On DC supply lines: 0.5 kV symmetrical and asymmetrical		
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)		
<b>Standards, approvals, certificates</b>			
Certificate of suitability	CE / RCM / EAC / UL / KC	CE	CE / RCM / EAC / UL / KC
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-30 °C		-30 °C
• max.	60 °C		60 °C
• horizontal installation, min.	-30 °C	-30 °C; = Tmin	-30 °C
• horizontal installation, max.	60 °C	60 °C; = Tmax	60 °C
• vertical installation, min.	-30 °C	-30 °C; = Tmin	-30 °C
• vertical installation, max.	50 °C	50 °C; = Tmax	50 °C
<b>Ambient temperature during storage/transportation</b>			
• Storage, min.	-40 °C		
• Storage, max.	70 °C		
• Transportation, min.	-40 °C		
• Transportation, max.	70 °C		
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>			
• Operation, min.	5 %		5 %
• Operation, max.	95 %; no condensation		95 %; no condensation
• With condensation, tested in accordance with IEC 60068-2-38, max.		100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	
<b>Vibrations</b>			
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g		
<b>Shock testing</b>			
• Shock resistance acc. to IEC 60068-2-27	15 g / 11 ms		

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

### Technical specifications

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST	6AG1242-6TM10-2BB1 SIPLUS ET 200SP TM ECC 2xPWM ST	6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants		Yes; Incl. diesel and oil droplets in the air	
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3		Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	
- to chemically active substances according to EN 60721-3-3		Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-3		Yes; Class 3S4 incl. sand, dust, *	
- Against mechanical environmental conditions acc. to EN 60721-3-3		Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4		Yes; Class 3 (excluding trichlorethylene)	
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04		Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04		* The supplied plug covers must remain in place over the unused interfaces during operation!	
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086		Yes; Class 2 for high reliability	
• Protection against fouling acc. to EN 60664-3		Yes; Type 1 protection	
• Military testing according to MIL-I-46058C, Amendment 7		Yes; Discoloration of coating possible during service life	
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A		Yes; Conformal coating, Class A	
<b>Decentralized operation</b> to SIMATIC S7-1500	Yes		
<b>Dimensions</b>			
Width	20 mm		
Height	73 mm		
Depth	58 mm		
<b>Weights</b>			
Weight, approx.	32 g		51 g
<b>Other</b>			
Note:			The Tone Mask of the Green Phy defined in DIN 70121 for North America applies

## Technical specifications

Article number	<b>6FE1244-0AD10-0AA0</b> SIMATIC Calibration Kit TM ECC CCS2
<b>General information</b>	
Product type designation	Calibration kit TM ECC CCS2
Product description	Expansion kit for adjusting the powerline signal strength of an EVSE in accordance with DIN SPEC 70121/ISO 15118 or design guidelines for CCS charging stations
<b>Installation type/mounting</b>	
Mounting type	standard rail
<b>Supply voltage</b>	
Type of supply voltage	DC
Rated value (DC)	24 V; Optional: external infeed
Reverse polarity protection	Yes
<b>Load voltage L+</b>	
• Short-circuit protection	Yes
• Reverse polarity protection	Yes
<b>Input current</b>	
Current consumption, max.	0.5 A
<b>Interfaces</b>	
Number of other interfaces	2; 1x CCS (Combined Charging System) acc. to IEC 62196 1x power supply DC adapter (5.50 mm x 2.10 mm x 9.5 mm) 24 V
<b>Protocols</b>	
Vehicle communication according to IEC 61851	Yes; Mode 4
<b>EMC</b>	
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
<b>Degree and class of protection</b>	
IP degree of protection	IP30
<b>Standards, approvals, certificates</b>	
Certificate of suitability	CE

Article number	<b>6FE1244-0AD10-0AA0</b> SIMATIC Calibration Kit TM ECC CCS2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	40 °C
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-30 °C
• Storage, max.	85 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Up to max. 2 000 m
<b>Relative humidity</b>	
• Operation, min.	5 %
• Operation, max.	95 %
<b>Mechanics/material</b>	
Material of housing	Plastic: polycarbonate, abbreviation: PC- GF 10 FR
<b>Dimensions</b>	
Width	250 mm
Height	122 mm
Depth	160 mm
<b>Weights</b>	
Weight, approx.	1.5 kg

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIWAREX WP321

### Overview



SIWAREX WP321 is a versatile and flexible weighing module for the seamless integration of a static scale into the SIMATIC automation environment.

The electronic weighing system is integrated in the SIMATIC ET 200SP series and uses all the features of a modern automation system, such as integrated communication, operator control and monitoring, diagnostic system and configuration tools in the TIA Portal, SIMATIC STEP 7, WinCC flexible and PCS 7.

In conjunction with the digital SIWAREX DB junction box, up to four connected load cells can be diagnosed separately. This enables the weigh beam module to detect the failure of individual load cells and, in the event of an error, to provide relevant load cell data such as order number and location designation directly in the CPU or at the HMI.

This increases the operational reliability of the scale, reduces downtimes, makes commissioning easier and simplifies servicing.

All messages and process values of the individual load cell channels are of course available in the SIMATIC controller.

### Ordering data

### Article No.

#### TM SIWAREX WP321 weighing module

7MH4138-6AA00-0BA0

Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 x LC, 1 x RS 485.

#### SIWAREX WP321 Equipment Manual

Available in a range of languages  
Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

#### SIWAREX WP321 "Ready for Use"

TIA Portal and SIMATIC Manager sample configuration  
Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

#### SIWATOOL V4 & V7

7MH4900-1AK01

Service and commissioning software for SIWAREX weighing modules

#### SIWAREX PCS 7 AddOn Library for PCS7 V8.x and V9.0

7MH4900-1AK61

- Supports PROFINET

APL faceplates and function blocks for:

- SIWAREX U
- SIWAREX FTA
- SIWAREX FTC\_B (belt scale)
- SIWAREX WP321

Classic faceplate and function block for:

- SIWAREX FTC\_L (Loss-in-weight)

#### Accessories (mandatory requirement)

#### BaseUnit (Type A0 – one BaseUnit required for each WP321)

- For opening a new potential group
  - BU15P-16+A0+2D
  - BU15P-16+A10+2D
- For continuing the potential group
  - BU15P-16+A0+2B
  - BU15P-16+A10+2B

6ES7193-6BP00-0DA0  
6ES7193-6BP20-0DA0

6ES7193-6BP00-0BA0  
6ES7193-6BP20-0BA0

#### Shielded connection for BaseUnit (5 units / for 5 scales)

6ES7193-6SC00-1AM0

For laying the load cell cable

Ordering data	Article No.	Article No.
<b>Accessories (optional)</b>		
<b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	<b>7MH5001-0AA20</b>	
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel.	<b>7MH5001-0AA00</b>	
<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	<b>7MH5001-0AA01</b>	
<b>Digital SIWAREX DB junction box</b> For enhanced diagnostic and monitoring options in conjunction with SIWAREX WP electronics Enclosure made of: • Aluminum • Stainless steel	<b>7MH5001-0AD20</b> <b>7MH5001-0AD01</b>	
<b>SIWAREX IS Ex interface</b> For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. Approved for use in the EU • Short-circuit current < 199 mA DC • Short-circuit current < 137 mA DC	<b>7MH4710-5BA</b> <b>7MH4710-5CA</b>	
<b>Cable (optional)</b>		
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY</b> For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. • Sheath color: orange • For hazardous atmospheres. Sheath color: blue.	<b>7MH4702-8AG</b> <b>7MH4702-8AF</b>	
		<b>RS485/USB interface converter</b> Commercially available interface converter with FTDI chip, e.g. USB-Nano from CTI <a href="https://www.cti-shop.com/en/rs485-converter/usb-nano-485">https://www.cti-shop.com/en/rs485-converter/usb-nano-485</a>
		<b>Remote display</b> The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTA via an RS485 interface. Siebert Industrieelektronik GmbH PO Box 1180D-65565 Eppelborn, Germany Tel: +49 6806/980-9 Fax: +49 6806/980-999 Internet: <a href="https://www.siebert-group.com/en/">https://www.siebert-group.com/en/</a> Detailed information is available from the manufacturer.
		<b>Commissioning</b>
		<b>Commissioning charge for one static scale with SIWAREX module</b> (Flat charge for travel and setup must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale
		<b>9LA1110-8SN50-0AA0</b>
		<b>Flat charge for travel and setup in Germany</b>
		<b>9LA1110-8RA10-0AA0</b>

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIWAREX WP321

### Technical specifications

SIWAREX WP321	
<b>Integration in automation systems</b>	
SIMATIC S7-300, S7-400, S7-1200 and S7-1500	Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)
Other manufacturers (with restrictions)	Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)
<b>Communication interfaces</b>	<ul style="list-style-type: none"> <li>• SIMATIC ET 200SP backplane bus</li> <li>• RS 485 (SIWATOOL, Siebert remote display)</li> </ul>
<b>Commissioning options</b>	<ul style="list-style-type: none"> <li>• Using SIWATOOL V7</li> <li>• Using function block in SIMATIC CPU / Touch Panel</li> </ul>
<b>Measuring accuracy</b>	
According to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	± 2 million parts
Measuring frequency	100 / 120 / 600 Hz
<b>Digital filter</b>	Variable adjustable low-pass and average filter
<b>Typical applications</b>	<ul style="list-style-type: none"> <li>• Non-automatic weighing instruments</li> <li>• Force measurements</li> <li>• Fill-level monitoring</li> <li>• Belt tension monitors</li> </ul>
<b>Weighing functions</b>	
Weight values	<ul style="list-style-type: none"> <li>• Gross</li> <li>• Net</li> <li>• Tare</li> </ul>
Limit values	<ul style="list-style-type: none"> <li>• 2 × min/max</li> <li>• Empty</li> </ul>
Zeroing	Via command by controller or HMI
Tare	Via command by controller or HMI
External tare specification	Via command by controller or HMI
Calibration commands	Via command by controller or HMI

SIWAREX WP321	
<b>Load cells</b>	Full-bridge strain gauges in 4-wire or 6-wire system
<b>Load cell powering</b>	
Supply voltage (value applies at sensor, cable-related voltage drops of up to 5 V are controlled)	4.85 V DC ±2%
Permissible load resistance	<ul style="list-style-type: none"> <li>• <math>R_{Lmin}</math> &gt; 40 Ω</li> <li>• <math>R_{Lmax}</math> &lt; 4 100 Ω</li> </ul>
With SIWAREX IS Ex interface	<ul style="list-style-type: none"> <li>• <math>R_{Lmin}</math> &gt; 50 Ω</li> <li>• <math>R_{Lmax}</math> &lt; 4 100 Ω</li> </ul>
<b>Load cell characteristic</b>	1 ... 4 mV/V
<b>Permissible range of measuring signal (at greatest set characteristic value)</b>	-21.3 ... +21.3 mV
<b>Max. distance of load cells</b>	1000 m (459.32 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
<b>Approvals/certificates</b>	<ul style="list-style-type: none"> <li>• ATEX Zone 2</li> <li>• UL</li> <li>• FM</li> <li>• EAC</li> <li>• KCC</li> <li>• IECEx</li> <li>• RCM</li> </ul>
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	Typ. 0.1 A @ 24 V DC (0.2 A max.)
Max. power consumption SIMATIC Bus	30 mA
<b>IP degree of protection to DIN EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b>	
$T_{min(IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Vertical installation in SIMATIC S7 <sup>1)</sup>	-25 ... +50 °C (-13 ... 122 °F)
• Horizontal installation in SIMATIC S7 <sup>1)</sup>	-25 ... +60 °C (-13 ... 140 °F)
<b>EMC requirements</b>	According to IEC 61000-6-2, IEC 61000-6-4, OIML R76-1
<b>Dimensions (width)</b>	15 mm (0.6 inch)

<sup>1)</sup> The S7 standard modules may not be operated at temperatures below 0 °C (32 °F). For operating conditions below 0 °C (32 °F), SIMATIC modules from the SIPLUS series must be used.

## Overview



The SIWAREX WP351 is a compact, precise weighing module in the SIMATIC ET 200SP format.

With a width of just 20 mm it is one of the slimmest weighing modules on the market, yet its firmware includes the functionalities of an automatic totalizing weighing instrument and checking, bagging and filling scale.

All operating modes are part of the firmware and certified according to OIML R-51, R-61, R-76 and R-107\*. This means the WP351 can be used in both scales requiring official calibration and those that do not, where demands are high regarding speed and accuracy.

\* certificates available soon

## Ordering data

**TM SIWAREX WP351 HF weighing module**

SIMATIC ET 200SP,  
TM SIWAREX WP351 HF,  
legal-for-trade weighing module  
for automatic dosing, filling and  
checking scales and totalizing  
weighing instruments

## Article No.

7MH4138-6BA00-0CU0

**SIWAREX WP351 Equipment Manual**

Available in a range of languages

Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

**SIWAREX WP351 "Getting Started" sample project**

Sample software shows beginners  
how to program the scales in  
TIA Portal V15.1

Free download on the Internet at:  
<http://www.siemens.com/weighing/documentation>

**ET 200SP BaseUnit type U0**

- For constructing a new potential group (white)
- For continuing an existing potential group (gray)

6ES7193-6BP00-0DU0

6ES7193-6BP00-0BU0

**Shield connection for ET 200SP**

Includes 5 shield connections

6ES7193-6SC00-1AM0

**SIWAREX JB junction box, aluminum housing**

For connecting up to 4 load cells  
in parallel, and for connecting  
multiple junction boxes.

7MH5001-0AA20

**SIWAREX JB junction box, stainless steel housing**

For connecting up to 4 load cells  
in parallel.

7MH5001-0AA00

**SIWAREX JB junction box, stainless steel housing (ATEX)**

For parallel connection of up to  
4 load cells (for zone allocation,  
see manual or type-examination  
certificate).

7MH5001-0AA01

## Article No.

**SIWAREX IS Ex interface**

For intrinsically safe connection  
of load cells. With ATEX approval  
(not UL/FM). Suitable for  
SIWAREX electronic weighing  
systems. Compatibility of load cells  
must be checked separately.

- With short-circuit current  
< 199 mA DC
- With short-circuit current  
< 137 mA DC

7MH4710-5BA

7MH4710-5CA

**Cable (optional)****Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY**

For connecting SIWAREX electronic  
weighing systems to junction box  
(JB), extension box (EB) and  
Ex interface or between two EBs.  
For permanent installation.  
Occasional bending is possible.

External diameter:  
approx. 10.8 mm (0.43 inch)  
Permissible ambient temperature  
-40 ... +80 °C (-40 ... +176 °F)

Sold by the meter.

- Sheath color: orange
- For hazardous atmospheres.  
Sheath color: blue.

7MH4702-8AG

7MH4702-8AF

**Commissioning****Commissioning charge for one static scale with SIWAREX module**

(Flat charge for travel and setup  
must be ordered separately)

Scope:

- Recording of data
- Checking of mechanical installation  
of the scale
- Checking of electrical wiring and  
function
- Static adjustment of the scale

Requirements:

- Mechanical design functional
- Modules electrically wired and  
tested
- Calibration weights available
- Free access to scale

9LA1110-8SN50-0AA0

**Flat charge for travel and setup in Germany**

9LA1110-8RA10-0AA0

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIWAREX WP351

### Technical specifications

SIWAREX WP351	
Firmware version	V1.0
• FW update possible	Yes
Usable BaseUnits	BU type U0
Reliability	
Mean time between failures (MTBF)	62 years @ TA = 40 °C
Product function	
I&M data	Yes, I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated	Configurable as of V15 using HSP0281
• PROFIBUS as of GSD version/ GSD revision	GSD V04.02.41
• PROFINET as of GSD version/ GSD revision	GSDML V2.34
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Permissible range, low limit, static (DC)	19.2 V
• Permissible range, high limit, static (DC)	28.8 V
• Permissible range, low limit, dynamic (DC)	18.5 V
• Permissible range, high limit, dynamic (DC)	30.2 V
• Reverse polarity protection	Yes
• Non-periodic overvoltages	35 V DC for 500 ms with a recovery time of 50 s
Input current	
Current consumption, max.	Max. 140 mA @ 24 V DC + [DQ 3 × 0.5 A]
Power loss	
Typical power loss	1.7 W
Address range	
Assigned address range	
• Inputs	32 bytes
• Outputs	32 bytes
Power supply from SIMATIC S7 backplane bus	
Current consumption from ET 200SP backplane bus	Max. 27 mA @ 3.5 V (SBK4)
Analog load cell interface connection	
Error limit according to DIN 1319-1 at 20 °C (-4 °F) +/-10 K	≤ 0.002% v.E.
Relative accuracy (absolute accuracy can only be achieved with local calibration using calibration standards)	
Measuring accuracy in accordance with OIML R76-1:2006/ EN 45501:2015	
• Class	III
• Resolution (d=e)	3 × 6000 d
• Error percentage pi	0.4
• Step voltage	0.4 μV/e

SIWAREX WP351	
Accuracy delivery state	Typ. 0.1% v.E.
The accuracy is relevant for module exchange or theoretical adjustment	
Sampling rate	1.024 ms
Input signal resolution	± 20 000 000
Measuring ranges	0 ... ±1 mV/V 0 ... ±2 mV/V 0 ... ±4 mV/V
Common mode voltage range	+2.8 ... 7.7 V
Strain gauge supply (constant voltage)	10 V DC (+1 % / -3 %) at the EXC terminals
Short-circuit and overload protection	Yes
Connection	6-wire or 4-wire (parameterizable)
Sensor voltage monitoring	Typ. ≤ 5.0 V
Min. strain gauge input resistance per channel	
• Without SIWAREX IS Ex-i interface	56 Ω
• With SIWAREX IS Ex-i interface	Lower impedance by means of external supply possible 87 Ω @ type 7MH4710-5BA 180 Ω @ type 7MH4710-5CA
Max. strain gauge resistance	4 100 Ω
Temperature coefficient range	≤ ±5 ppm/K
Temperature coefficient zero point	≤ ±0.015 μV/K
Linearity error	≤ 0.001%
Measured value filtering	Low-pass and average value filter configurable (DR3)
Galvanic isolation	500 V AC
50 Hz / 60 Hz noise suppression CMRR	> 80 dB
Input resistance	
• Signal line	Typ. 8*10 <sup>6</sup> Ω
• Sense line	Typ. 300*10 <sup>6</sup> Ω
Cable length	
• When using SIWAREX cable 7MH4702-8AG	Max. 500 m
Ambient conditions	
Ambient temperature in operation	
• Horizontal mounting position *	Min. -30 °C Max. +60 °C
• Vertical mounting position *	Min. -30 °C Max. +50 °C
Storage and transport temperature	-40 ... +70 °C (-40 ... +158 °F)

\* At a height of more than 2 000 meters above sea level, a derating of the ambient temperature of -1°C / 100 m has to be adhered to. The maximum permissible height is 5 000 meters above sea level. At over 0.6 A total current of the digital outputs DQ, a derating of the ambient temperature of -1°C per 100 mA has to be adhered to. The max. permissible total current is 1.5 A.



## Overview

**Technical properties**

- Counter module for ET 200SP
- Interfaces:
  - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
  - 24 V encoder supply output, short-circuit proof
  - 3 digital inputs for controlling the count operation, for saving or for setting the count value
  - 2 digital outputs for fast reactions regardless of the counter status or measured value

- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

**Supported types of encoders/signals**

- 24 V incremental encoder with and without signal N
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

**Supported system functions**

- Isochronous mode
- Firmware update
- Identification data I&M

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Ordering data****Article No.****SIPLUS TM Count 1x24V counter module**

(Extended temperature range and exposure to environmental substances)

With one channel, max. 200 kHz; for 24 V encoder

**6AG1138-6AA01-2BA0****Usable BaseUnits**

(Extended temperature range and exposure to environmental substances)

**BU15-P16+A0+2D**

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**6AG1193-6BP00-7DA0****BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**6AG1193-6BP00-7BA0****Article No.****BU15-P16+A10+2D**

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

**6AG1193-6BP20-7DA0****BU15-P16+A10+2B**

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

**6AG1193-6BP20-7BA0****SIPLUS Mounting Kit ET 200SP**

Mounting accessories for use with increased mechanical vibration and shock loads.

**6AG1193-6AA00-0AA0****Other accessories**

See SIMATIC TM Count 1x24V counter module, page 10/98

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Count 1x24V counter module

### Technical specifications

Article number	<b>6AG1138-6AA01-2BA0</b>
Based on	<b>6ES7138-6AA01-0BA0</b> SIPLUS ET 200SP TM COUNT 1X24V
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	<b>6AG1138-6AA01-2BA0</b>
Based on	<b>6ES7138-6AA01-0BA0</b> SIPLUS ET 200SP TM COUNT 1X24V
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview

**Technical properties**

- Counting and position detection module for ET 200SP
- Interfaces:
  - Encoder signals A, B and N for 5 V TTL or RS 422 differential signals
  - SSI interface with clock and data for RS 422 differential signals
  - 24 V encoder supply output, short-circuit proof
  - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
  - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counter frequency 1 MHz (4 MHz with four-fold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

**Supported types of encoders/signals**

- Incremental encoders with or without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

**Supported system functions**

- Isochronous mode
- Firmware update
- Identification data I&M

**Note**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS TM PosInput 1 counting and position detection module**

(Extended temperature range and exposure to environmental substances)

With one channel, max. 1 MHz for 5 V TTL or RS422 differential signals or SSI absolute encoder

6AG1138-6BA00-2BA0

**Usable BaseUnits**

(Extended temperature range and exposure to environmental substances)

**BU15-P16+A0+2D**

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

**BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

**BU15-P16+A10+2D**

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

**BU15-P16+A10+2B**

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

**Accessories****SIPLUS Mounting Kit ET 200SP**

Mounting accessories for use with increased mechanical vibration and shock loads.

6AG1193-6AA00-0AA0

**Other accessories**

See TM PosInput 1 counting and position detection module, page 10/102

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Technology modules > SIPLUS TM PosInput 1 counting and position detection module****Technical specifications**

Article number	<b>6AG1138-6BA00-2BA0</b>
Based on	<b>6ES7138-6BA00-0BA0</b> SIPLUS ET 200SP TM POSINPUT 1
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; see Derating BasedOn (e.g. manual)
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	<b>6AG1138-6BA00-2BA0</b>
Based on	<b>6ES7138-6BA00-0BA0</b> SIPLUS ET 200SP TM POSINPUT 1
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with  $\mu\text{s}$  accuracy
- Outputs for outputting the switching signals with  $\mu\text{s}$  accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

**Note**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

## Ordering data

## Article No.

**SIPLUS TM timer DIDQ 10x24 V time-based IO module**

(Extended temperature range and exposure to environmental substances)

4 time-controlled inputs,  
6 time-controlled outputs

**6AG1138-6CG00-2BA0****Usable BaseUnits**

(Extended temperature range and exposure to environmental substances)

**BU15-P16+A0+2D****6AG1193-6BP00-7DA0**

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**BU15-P16+A0+2B****6AG1193-6BP00-7BA0**

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**BU15-P16+A10+2D****6AG1193-6BP20-7DA0**

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

**BU15-P16+A10+2B****6AG1193-6BP20-7BA0**

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

**Accessories****SIPLUS Mounting Kit ET 200SP****6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads.

**Other accessories**

See SIMATIC TM timer DIDQ 10x24V time-based IO module, page 10/105

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM timer DIDQ 10x24 V time-based IO module

### Technical specifications

Article number	<b>6AG1138-6CG00-2BA0</b>	Article number	<b>6AG1138-6CG00-2BA0</b>
Based on	<b>6ES7138-6CG00-0BA0</b> SIPLUS ET 200SP TM TIMER DIDQ 10x24V	Based on	<b>6ES7138-6CG00-0BA0</b> SIPLUS ET 200SP TM TIMER DIDQ 10x24V
<b>Ambient conditions</b>		<b>Use on ships/at sea</b>	
<b>Ambient temperature during operation</b>		- to biologically active substances according to EN 60721-3-6	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
• horizontal installation, max.	60 °C; = Tmax; see Derating BasedOn (e.g. manual)	- to chemically active substances according to EN 60721-3-6	
• vertical installation, min.	-40 °C; = Tmin	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)	- to mechanically active substances according to EN 60721-3-6	
<b>Altitude during operation relating to sea level</b>		- Against mechanical environmental conditions acc. to EN 60721-3-6	
• Installation altitude above sea level, max.	5 000 m	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	<b>Usage in industrial process technology</b>	
<b>Relative humidity</b>		- Against chemically active substances acc. to EN 60654-4	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	
<b>Resistance</b>		<b>Remark</b>	
<b>Coolants and lubricants</b>		- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	<b>Conformal coating</b>	
<b>Use in stationary industrial systems</b>		• Coatings for printed circuit board assemblies acc. to EN 61086	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 2 for high reliability	
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	• Protection against fouling acc. to EN 60664-3	
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Type 1 protection	
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	• Military testing according to MIL-I-46058C, Amendment 7	
		• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	
		Yes; Discoloration of coating possible during service life	
		Yes; Conformal coating, Class A	

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## Overview



2-channel pulse output module for SIPLUS ET 200SP

- Operating modes:
  - Single pulse with defined length
  - Pulse chain with defined number of pulses
  - Pulse width modulation (with flexible ON period, optional current control and dither function)
  - PWM signal for controlling a DC motor
  - ON and OFF delay; rising and falling edge can be delayed separately to the microsecond
  - Frequency output with defined output frequency
- Hardware:
  - 2 channels 24 V, 2 A output current output current can be switched in parallel to boost performance to 4 A of output current
  - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
  - Push/pull output driver for especially steep edges at the outputs
  - Polarity change in DC motor operation for direction reversal
  - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4  $\mu$ s
- Channel functions:
  - HW enable; Start of signal output with the onboard digital input
  - Parameterizable ON delay; for precise deceleration between the HW enable and the start of output
  - Current measurement in the operating modes pulse-width modulation and pulse chain; enables control of the output current mean value over a period. Temperature influences can thus be balanced to the resistance of the actuator.
  - Cyclic control of the respective main setpoint from the PLC in every operating mode; other values can be modified flexibly from the user program.
- Supported system functions:
  - Isochronous mode; enables precision-timed connection of the setpoint output to a higher-level controller
  - Firmware update
  - Identification data I&M

#### Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS TM Pulse 2x24V pulse output module**
**6AG1138-6DB00-2BB1**

(Extended temperature range and exposure to environmental substances)

PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors

**Usable BaseUnits**

(Extended temperature range and exposure to environmental substances)

**BU20-P12+A0+4B**
**6AG1193-6BP20-7BB1**

BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group

**Accessories**
**SIPLUS Mounting Kit ET 200SP**
**6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads.

**Other accessories**

See  
SIMATIC TM Pulse 2x24V pulse output module, page 10/108

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Pulse 2x24V pulse output module

### Technical specifications

Article number	<b>6AG1138-6DB00-2BB1</b>	Article number	<b>6AG1138-6DB00-2BB1</b>
Based on	<b>6ES7138-6DB00-0BB1</b> SIPLUS ET 200SP TM PULSE 2x24V	Based on	<b>6ES7138-6DB00-0BB1</b> SIPLUS ET 200SP TM PULSE 2x24V
<b>Ambient conditions</b>		<b>Use on ships/at sea</b>	
<b>Ambient temperature during operation</b>		- to biologically active substances according to EN 60721-3-6	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
• horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module	- to chemically active substances according to EN 60721-3-6	
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
• vertical installation, max.	50 °C; Observe derating	- to mechanically active substances according to EN 60721-3-6	
<b>Altitude during operation relating to sea level</b>		Yes; Class 6S3 incl. sand, dust; *	
• Installation altitude above sea level, max.	5 000 m	- Against mechanical environmental conditions acc. to EN 60721-3-6	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	<b>Usage in industrial process technology</b>	
<b>Relative humidity</b>		- Against chemically active substances acc. to EN 60654-4	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	
<b>Resistance</b>		<b>Remark</b>	
<b>Coolants and lubricants</b>		- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	<b>Conformal coating</b>	
<b>Use in stationary industrial systems</b>		• Coatings for printed circuit board assemblies acc. to EN 61086	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 2 for high reliability	
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	• Protection against fouling acc. to EN 60664-3	
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Type 1 protection	
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	• Military testing according to MIL-I-46058C, Amendment 7	
		Yes; Discoloration of coating possible during service life	
		• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	
		Yes; Conformal coating, Class A	



## Overview



SIPLUS Electrical Charging Controllers are the key components in infrastructure solutions for the conductive charging of electric vehicles.

They perform the following functions:

- Detection of the charging cable and its permissible current carrying capacity
- Transfer of the maximum charging current from the charging station to the electric vehicle
- Evaluation of the status signals from the electric vehicle:
  - Ready for charging
  - Charging
  - Charging with ventilation
- Cost-optimized, space-saving charging infrastructure solutions due to compact design based on SIMATIC ET 200SP

**SIPLUS ET 200SP TM ECC 2xPWM ST AC module**

- Control of charging outputs according to IEC 61851 by parameterizable SIPLUS ET 200SP TM ECC 2xPWM ST charging controller
- Control of load tap-off
- Control of connector lock
- Evaluation of connector lock or load contactor status

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

**SIPLUS ET 200SP  
TM ECC 2xPWM ST  
charging controller****6AG1242-6TM10-2BB1**

(Exposure to environmental substances)

Designed for controlling charging outputs according to IEC 61851 and parameterizable, with 2 charging outputs, ambient temperature -30 °C ... 60° C;

2x control pilot,  
2x plug present,  
2x DQ switching contact for load contactor as open collector,  
2x DI for load contactor feedback or connector lock;

**Accessories****SIPLUS Mounting Kit ET 200SP****6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads.

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS ET 200SP ECC charging controller

### Technical specifications

Article number	<b>6AG1242-6TM10-2BB1</b>
Based on	<b>6ES7242-6TM10-0BB1</b> SIPLUS ET 200SP TM ECC 2xPWM ST
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	70 °C
• Transportation, min.	-40 °C
• Transportation, max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Vibrations</b>	
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g
<b>Shock testing</b>	
• Shock resistance acc. to IEC 60068-2-27	15 g / 11 ms
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air

Article number	<b>6AG1242-6TM10-2BB1</b>
Based on	<b>6ES7242-6TM10-0BB1</b> SIPLUS ET 200SP TM ECC 2xPWM ST
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview



SIPLUS WP321 is a versatile and flexible weighing module for the seamless integration of a static scale into the SIMATIC automation environment.

The electronic weighing system is integrated in the SIPLUS ET 200SP series and uses all the features of a modern automation system, such as integrated communication, operator control and monitoring, diagnostic system and configuration tools in the TIA Portal, SIMATIC STEP 7, WinCC flexible and PCS 7.

## Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information has been added.

SIPLUS WP321	
Article No.	6AG1138-6AA00-2BA8
Article No. based on	7MH4138-6AA00-0BA0
Ambient temperature range	-40 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply, except for the ambient conditions.

## Ordering data

Ordering data	Article No.
<b>SIPLUS WP321 weighing module</b> Single-channel, for platform or hopper scales with analog load cells (1–4 mV/V), 1 x LC, 1 x RS 485.  Extended temperature range and exposure to environmental substances	<b>6AG1138-6AA00-2BA8</b>
<b>Accessories</b>	
<b>Mandatory</b>	
<b>BaseUnit</b> Type A0 – one BaseUnit required for each WP321 • For opening a new potential group - BU15P-16+A0+2D or - BU15P-16+A10+2D • For continuing the potential group - BU15P-16+A0+2B - BU15P-16+A10+2B	<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP20-0DA0</b>  <b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP20-0BA0</b>
<b>Consumables</b>	
<b>Shield connection for BaseUnit</b> For laying the load cell cable (5 units / for 5 weighing instruments)	<b>6ES7193-6SC00-1AM0</b>
<b>Shield connection element</b> Sufficient for one SIWAREX FTA module	<b>6ES7390-5AA00-0AA0</b>
<b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	<b>7MH5001-0AA20</b>
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel.	<b>7MH5001-0AA00</b>

Ordering data	Article No.
<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	<b>7MH5001-0AA01</b>
<b>Ex interface, type SIWAREX IS</b> For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of the load cells must be checked separately. • With short-circuit current < 199 mA DC • With short-circuit current < 137 mA DC	<b>7MH4710-5BA</b> <b>7MH4710-5CA</b>
<b>Cables (optional)</b> <b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) CY, orange sheath</b> For connecting SIWAREX electronic weighing systems to junction boxes (JB), extension boxes (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is permitted. Outer diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter Sheath color: orange For hazardous areas. Sheath color: blue	<b>7MH4702-8AG</b> <b>7MH4702-8AF</b>

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS SIWAREX WP321

Ordering data	Article No.	Article No.
<b>Configuration software</b>		
<b>SIWATOOL V4 &amp; V7</b> Service and commissioning software for SIWAREX weighing modules	<b>7MH4900-1AK01</b>	
<b>SIWAREX PCS 7 AddOn Library for PCS 7 V8.x and V9.0</b> • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scales) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (loss in weight)	<b>7MH4900-1AK61</b>	
<b>Documentation</b>		
<b>SIWAREX WP321 Equipment Manual</b> Available in a range of languages Free download from the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		
		<b>SIWAREX WP321 "Ready for use"</b> TIA Portal and SIMATIC Manager sample configuration Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>
		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC
		<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates

## Technical specifications

SIPLUS WP321	6AG1138-6AA00-2BA8	SIPLUS WP321	6AG1138-6AA00-2BA8
Based on	<b>7MH4138-6AA00-0BA0</b>	Based on	<b>7MH4138-6AA00-0BA0</b>
<b>Environmental conditions</b>		<b>Resistance</b>	
Climatic requirements		• Coolants and lubricants	
$T_{min(IND)} \dots T_{max(IND)}$ (operating temperature)		- Resistant to commercially available coolants and lubricants	Yes; incl. airborne diesel and oil droplets
• Vertical installation	-40 ... +50 °C	• For use in stationary industrial equipment	
• Horizontal installation	-40 ... +60 °C	- Resistant to biologically active substances, acc. to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna); Class 3B3 on request
Operating height in relation to sea level		- Resistant to chemically active substances acc. to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity 3)*
• Installation altitude above sea level, max.	5 000 m	- Resistant to mechanically active substances acc. to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust*
• Ambient temperature, air pressure and altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	• For use on ships/at sea	
Relative humidity		- Resistant to biologically active substances acc. to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
• With condensation, tested according to IEC 60068-2-38, max.	100%; RH including condensation/frost (no commissioning when condensation is present), horizontal installation	- Resistant to chemically active substances acc. to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity 3)*
		- Resistant to mechanically active substances acc. to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust*
		• Note	
		- Note on classification of environmental conditions acc. to EN 60721	*. The supplied plug covers must remain in place on the unused interfaces during operation.
		<b>Conformal coating</b>	
		• Coating for PCBs acc. to EN 61086	Yes; Class 2 for high availability
		• Military testing acc. to MIL-I-46058C, Amendment 7	Yes; coating discoloration possible
		• Qualification and Performance of Electrical Insulating Compound for Printed Wiring Assemblies acc. to IPC-CC-830A	Yes; conformal coating, class A

## Overview



SIMATIC ET 200SP CM PtP video

[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6136809673001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6136809673001)


- CM PtP communications module; module for serial communication connections with RS232 and RS422 interfaces. RS485 for the Freepoint, 3964(R), Modbus RTU, USS and DMX512 protocols, max. 115.2250 kbps, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
  - Freepoint: User-parameterizable frame format for universal communication, also known as ASCII frame
  - 3964(R) for improved transmission reliability
  - Modbus RTU master (requires instructions in SIMATIC S7)
  - Modbus RTU slave (requires instructions in SIMATIC S7)
  - USS, implemented through instructions
  - DMX512, can be implemented through instructions
- Interface properties
  - RS232 with auxiliary signals
  - RS422 for full-duplex connections
  - RS485 for half-duplex and multi-point connections
  - Transmission rates from 300 to 115200 bps for RS232 and RS422
  - Transmission rates from 300 to 25000 bps for RS485
- Frame lengths
  - In universal operation: 2 KB each in send and receive direction
  - In performance-optimized operation: 30 bytes in send direction, 24 bytes in receive direction
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Color coding of the module type
  - Hardware and firmware version
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; Communication &gt; CM PtP serial interface

**Ordering data****Article No.****Article No.****CM PtP communications module**

For serial communication connections with RS232, RS422, RS485 interfaces, BU type A0, color code CC00

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10

**6ES7137-6AA01-0BA0**  
**6ES7137-6AA01-2BA0**

**Accessories****BU15-P16+A10+2D**

BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0**

**BU15-P16+A0+2D**

BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

**2BU15-P16+A0+2DB**

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit

**6ES7193-6BP60-0DA0**

**BU15-P16+A10+2B**

BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0**

**BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0**

**2BU15-P16+A0+2B**

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit

**6ES7193-6BP60-0BA0**

**Equipment labeling plate**

10 sheets of 16 labels

**6ES7193-6LF30-0AW0**

**Labeling strips**

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

**Shield connection**

5 shield supports and 5 shield terminals, for direct connection

**6ES7193-6SC00-1AM0**

**Mechanical coding elements**

For automatic coding of I/O modules; spare part. 20 units

Type A  
Type B  
Type C  
Type D

**6ES7193-6KA00-3AA0**  
**6ES7193-6KB00-3AA0**  
**6ES7193-6KC00-3AA0**  
**6ES7193-6KD00-3AA0**

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### Technical specifications

Article number	<b>6ES7137-6AA01-0BA0</b> ET 200SP, CM PTP, PU 1
<b>General information</b>	
Product type designation	CM PtP
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V17 or higher
• STEP 7 configurable/integrated from version	via GSD as of V5.6 HF4
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>1. Interface</b>	
<b>Interface types</b>	
• RS 485	Yes
• RS 422	Yes
• RS 232	Yes
• Design of the connection	Push-in terminal
<b>Interface types</b>	
<b>RS 232</b>	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	15 m
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD
<b>RS 485</b>	
• Transmission rate, max.	250 kbit/s
• Cable length, max.	1 200 m; 100 to 1200 m, depending on transmission speed
<b>RS 422</b>	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	Yes
<b>Integrated protocols</b>	
<b>Freeport</b>	
- Telegram length, max.	2 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
<b>3964 (R)</b>	
- Telegram length, max.	2 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any

Article number	<b>6ES7137-6AA01-0BA0</b> ET 200SP, CM PTP, PU 1
<b>Modbus RTU master</b>	
- Address area	1 to 247, extended 1 to 65535
- Number of slaves, max.	32
<b>MODBUS RTU slave</b>	
- Address area	1 to 247, extended 1 to 65535
<b>Telegram buffer</b>	
• Buffer memory for telegrams	4 kbyte
• Number of telegrams which can be buffered	255
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnoses</b>	
• Wire-break	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED
<b>Potential separation</b>	
between backplane bus and interface	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	30 g

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > CM 4x IO-Link

**Overview**

- CM 4x IO-Link communications module  
Serial communications module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher
- Time-based IO  
Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or fluids dosed in precise quantities
- Supported data transfer rates
  - COM1 (4.8 kbps)
  - COM2 (38.4 kbps)
  - COM3 (230.4 kbps)

- Expansion limits
  - Length of cable: Max. 20 m
  - Max. 32 bytes of input and output data per port
  - Max. 144 bytes of input data and 128 bytes of output data per module
- Supported ET 200SP system functions
  - Replacement without PG with automatic backup without the engineering tool of the IO-Link device parameters (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
  - Re-parameterization during operation
  - Identification data I&M
  - Firmware update
  - PROFlenergy
- Can be plugged into Type A0 BaseUnits (BU) with automatic e-coding
- LEDs
  - DIAG: Operating state indicator (green/red) of the module
  - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
  - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
  - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
  - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color-coding of the CM module class: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional accessories
  - Labeling strips
  - Equipment labeling plates
  - Color-coding plate with color code CC04
- Optional system-integrated shield connection

Overview of CM 4 x IO-Link

Communications module	Article No.	CC code	BU type	PU
CM 4 x IO-Link	6ES7137-6BD00-0BA0	CC04	A0	1



**Overview**

## Overview of BaseUnits

BaseUnit	Article No.	CC codes for push-in terminals	CC codes for AUX terminals	PU
<b>BU type A0</b> • New load group (light) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • New load group (light) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • New load group (light) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
<b>BU type A0</b> • New load group (light) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; Communication &gt; CM 4x IO-Link

**Ordering data****Article No.****CM 4x IO-Link master V1.1  
Standard communications module**

Serial communications module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04

**6ES7137-6BD00-0BA0****Accessories****Usable type A0 BaseUnits****BU15-P16+A10+2D**

BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP20-0DA0  
6ES7193-6BP20-2DA0****BU15-P16+A0+2D**

BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0DA0  
6ES7193-6BP00-2DA0****2BU15-P16+A0+2DB**

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit

**6ES7193-6BP60-0DA0****BU15-P16+A10+2B**

BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP20-0BA0  
6ES7193-6BP20-2BA0****BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0BA0  
6ES7193-6BP00-2BA0****2BU15-P16+A0+2B**

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit

**6ES7193-6BP60-0BA0****Article No.****Equipment labeling plate**

10 sheets of 16 labels, for printing with thermal transfer card printer or plotter

**6ES7193-6LF30-0AW0****Labeling strips**

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AG0**

1 000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer

**6ES7193-6LA10-0AA0**

1 000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer

**6ES7193-6LA10-0AG0****Color-coded labels**

Color code CC04, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16); 10 units

**6ES7193-6CP04-2MA0**

Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units

**6ES7193-6CP71-2AA0**

Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units

**6ES7193-6CP72-2AA0**

Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units

**6ES7193-6CP73-2AA0****Spare parts****Electronic coding element type H**

Pack of 5 units; included in scope of supply of CM 4x IO-Link module

**6ES7193-6EH00-1AA0****Mechanical coding elements**

For automatic coding of I/O modules; spare part. 20 units

Type A

**6ES7193-6KA00-3AA0**

Type B

**6ES7193-6KB00-3AA0**

Type C

**6ES7193-6KC00-3AA0**

Type D

**6ES7193-6KD00-3AA0**

### Technical specifications

Article number	<b>6ES7137-6BD00-0BA0</b> ET 200SP, cm 4 X IO-Link ST
<b>General information</b>	
Product type designation	CM 4 x IO-Link ST
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15 or higher
• STEP 7 configurable/integrated from version	STEP 7 V5.5 or higher
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Encoder supply</b>	
Number of outputs	4
<b>Output current</b>	
• Rated value	200 mA; Per channel
<b>24 V encoder supply</b>	
• Short-circuit protection	Yes
<b>IO-Link</b>	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Cycle time, min.	2 ms; dynamic, depending on user data length
Size of process data, input per port	32 byte; max.
Size of process data, input per module	144 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	128 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m
<b>Operating modes</b>	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA per channel

Article number	<b>6ES7137-6BD00-0BA0</b> ET 200SP, cm 4 X IO-Link ST
<b>Time Based IO</b>	
- TIO IO-Link IN	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
- TIO IO-Link OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
- TIO IO-Link IN/OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
<b>Connection of IO-Link devices</b>	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal
• via three-wire connection	Yes
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; one green LED for channel status Qn (SIO mode) and port status Cn (IO-Link mode) per channel
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and back-plane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
<b>Dimensions</b>	
Width	13 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	30 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > CM 1xDALI

### Overview



SIMATIC ET 200SP DALI video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6153144008001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6153144008001)



- DALI 2 multimaster module for 1 bus strand
- Allows the control, diagnostics and parameter assignment of up to 64 luminaires and 63 sensors via a 2-wire bus line
- Typical areas of application: Lighting in tunnels, (factory) halls or ships
- Realization of the control via prefabricated blocks of a function block library in TIA Portal
- DALI (Digital Addressable Lighting Interface) certification according to DALI V2 for IEC 62386-101/-103 parts
- Different DALI device types, such as LED modules, fluorescent lamps, discharge lamps, low-voltage halogen lamps and others, can be used

### Ordering data

### Article No.

#### DALI V2 multimaster module CM 1xDALI

For control of lighting solutions with DALI V2, BU type U0, color code CC20

6ES7137-6CA00-0BU0

#### Accessories

#### Suitable type U0 BaseUnits

#### BU20-P16+A0+2D

BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0DU0  
6ES7193-6BP00-2DU0

#### BU20-P16+A0+2B

BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0BU0  
6ES7193-6BP00-2BU0

#### Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

#### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

#### Mechanical coding elements

For automatic coding of I/O modules; spare part.  
20 units

Type A

6ES7193-6KA00-3AA0

Type B

6ES7193-6KB00-3AA0

Type C

6ES7193-6KC00-3AA0

Type D

6ES7193-6KD00-3AA0

### Technical specifications

Article number	<b>6ES7137-6CA00-0BU0</b> ET 200SP, CM 1x DALI
<b>General information</b>	
Product type designation	CM 1xDALI
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V15.1 or higher
• PROFIBUS from GSD version/ GSD revision	GSD Revision 5
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>DALI</b>	
• Integrated power supply	Yes
- Supply current, min.	160 mA
- Supply current, max.	250 mA
- Can be switched off	Yes
• Cable length, max.	300 m
<b>DALI</b>	
• Standard according to DALI	DALI V2 Multi-Master
<b>Supported operating devices</b>	
- Fluorescent lamps (device type 0)	Yes
- Emergency lighting with single battery (device type 1)	Yes
- Discharge lamps (device type 2)	Yes
- Low-voltage halogen lamps (device type 3)	Yes
- Incandescent lamps (device type 4)	Yes
- Direct voltage (device type 5)	Yes
- LED modules (device type 6)	Yes
- Switching function (device type 7)	Yes
- Color control (device type 8)	Yes
- Further operating devices	Yes; general device type
<b>Supported input devices</b>	
- Pushbuttons	Yes
- Absolute input devices	Yes
- Presence detector	Yes
- Light sensor	Yes
- Further input devices	Yes; general device type

Article number	<b>6ES7137-6CA00-0BU0</b> ET 200SP, CM 1x DALI
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Short-circuit	Yes; On DALI bus
<b>Diagnostics indication LED</b>	
• ERROR LED	Yes
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED
<b>Potential separation</b>	
between backplane bus and interface	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
RoHS conformity	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Decentralized operation</b>	
to SIMATIC S7-1200	Yes; FW V4.0 or higher
to SIMATIC S7-1500	Yes
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	50 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > CM CAN

### Overview

- For data exchange between an ET 200SP system and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
  - Node / lifeguarding
  - Heartbeat
  - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V15.1 or higher
- CAN connection with Push-in terminals
- Integrated CAN bus terminating resistor
- Up to 60 CAN nodes
- 128 receiver and 128 transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Optionally with function block SIMATIC ECC CHAdeMO: Realization of digital communication as basis for conductible DC charging of electric vehicles in line with the CHAdeMO standard

### Ordering data

### Article No.

#### ET 200SP CM CAN communications modules

To connect ET 200SP with CAN bus or CANopen networks CAN bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302

**6ES7137-6EA00-0BA0**

#### Accessories

#### Function block SIMATIC ECC CHAdeMO

For realization of digital communication between a DC charging station and an electric vehicle according to CHAdeMO 1.x-2.0 specification; can be used with TIA Portal as of V15.1; Single license

**6FE1263-8FB10-0AA0**

#### Usable type A0 BaseUnits

##### BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

##### BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0**

#### Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A

**6ES7193-6KA00-3AA0**

Type B

**6ES7193-6KB00-3AA0**

Type C

**6ES7193-6KC00-3AA0**

Type D

**6ES7193-6KD00-3AA0**

### Technical specifications

Article number	<b>6ES7137-6EA00-0BA0</b> ET 200SP CM CAN
<b>General information</b>	
Product type designation	CM 1x CAN ST
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes
• Isochronous mode	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15.1 or higher
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Interfaces</b>	
<b>CAN</b>	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	10 kbit/s
• Transmission rate, max.	1 000 kbit/s
• Number of slaves, max.	60
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	128; Send / receive
<b>Services</b>	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes
<b>1. Interface</b>	
Interface type	CAN according to CiA 303-1
Isolated	Yes; 500 V AC or 707 V DC
<b>Interface types</b>	
• Number of ports	1
• Design of the connection	Push-in terminal
<b>Interrupts/diagnostics/ status information</b>	
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED

Article number	<b>6ES7137-6EA00-0BA0</b> ET 200SP CM CAN
<b>Potential separation</b>	
between backplane bus and interface	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes; Reg. No.: R-R-S49-ET200SPCMCAN
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
<b>Decentralized operation</b>	
to SIMATIC S7-300	No
to SIMATIC S7-400	No
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	32 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > CM AS-i Master ST for SIMATIC ET 200SP

### Overview



CM AS-i Master ST for SIMATIC ET 200SP

A short video shows the setup of AS-Interface with ET 200SP:



[https://players.brightcove.net/1813624294001/70fec0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoid=6136807004001](https://players.brightcove.net/1813624294001/70fec0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoid=6136807004001)

#### More information

SIMATIC ET 200SP Manual Collection,  
see <https://support.industry.siemens.com/cs/ww/en/view/84133942>

Diagnostic blocks with visualization,  
see <https://support.industry.siemens.com/cs/ww/en/view/109479103>

AS-Interface block library for SIMATIC PCS 7 for simple connection of AS-Interface to PCS 7,  
see <https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10046725?tree=CatalogTree>

Released combinations of the AS-i modules for ET 200SP,  
see <https://support.industry.siemens.com/cs/ww/en/view/103624653>

The CM AS-i Master ST communications module is designed for use in the SIMATIC ET 200SP distributed I/O system and has the following features:

- Connection of up to 62 AS-Interface slaves
- Supports all AS-Interface master functions according to the AS-Interface specification V3.0
- User-friendly configuration with graphic display of the AS-i line in TIA Portal V12 or higher, or via GSD in other systems
- Supply via AS-Interface cable

- Suitable for AS-Interface with 30-V voltage and AS-i Power24V
- Integrated ground-fault monitoring for the AS-Interface cable
- Through connection to AS-Interface, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM AS-i Master ST)
- Integrated analog value processing

#### AS-i gateways with ET 200SP

An AS-i gateway or AS-i link enables access to the AS-Interface data via PROFINET or PROFIBUS.

With the CM AS-i Master ST module, flexible and powerful PROFINET/AS-i links or PROFIBUS/AS-i link solutions are set up. Depending on the requirements, even several AS-i masters can be plugged into one ET 200SP station, so that the setup can easily be extended from a single master to double masters or multiple masters.

The maximum number of modules is determined by the ET 200SP interface module (IM): up to 8 AS-i masters with PROFINET IM 155-6PN Standard, up to 43 AS-i masters with IM 155-6PN High Feature, or a single AS-i master with IM 155-6PN Basic. For the connection to PROFIBUS, the IM 155-6DP HF interface module with up to 7 AS-i master modules is used.

Since in many plants an ET 200SP station is provided with I/O, motor starter or other peripheral modules, the AS-i master modules are simply plugged in without any additional effort.

An AS-i Safety gateway can also be implemented without any problems by adding the safety-oriented module F-CM AS-i Safety ST in the ET 200SP station. This greatly simplifies the cabling and connection of distributed EMERGENCY STOP pushbuttons and protective door monitoring systems to a Failsafe CPU. The AS-i Safety application is completely configured in TIA Portal/STEP 7.

The ET 200SP modules CM AS-i Master ST and F-CM AS-i Safety ST (see page 10/207) can of course also be used directly on an ET 200SP CPU or F-CPU, so that an extremely compact SIMATIC control system with AS-i bus connection can be set up.

For further application possibilities,  
see the brochure "The modular AS-i Master" at <https://www.siemens.com/as-interface>.

More information, see SIMATIC ET 200SP Manual Collection

#### Design

The CM AS-i Master ST module has an ET 200SP module enclosure with a width of 20 mm. A C0 type BaseUnit (BU) is required for use in the ET 200SP.

The communications module has LED indicators for diagnostics, operation, AS-i voltage and AS-i slave status and offers informative front-side module inscription for:

- Plain-text marking of the module type and function class
- 2D matrix code (Article No. and serial number)
- Connection diagram
- Color coding module type communications module, light gray
- Hardware and firmware version
- Supported BaseUnit type BU: C0



## Overview

### Function

The CM AS-i Master ST supports all specified functions of the AS-Interface Specification V3.0.

The input/output values of the digital AS-i slaves can be activated via the cyclic process image. The values of the analog AS-i slaves are accessible via the cyclic process image or via data record transfer.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM AS-i Master ST in STEP 7.

In order to implement modular machine concepts, the AS-i slaves can be activated or deactivated via the PLC program (option handling). The configuration of AS-i slaves can be modified while being executed, thus enabling variable machine setups and tool changing with integrated input/output modules during ongoing operation. Without deactivating the controller, AS-i input/output modules can be added in the system.

An existing AS-i installation can be read into the STEP 7 hardware configuration and then adapted and documented in the project. Analog values are transmitted via the cyclic process image, the length of which is adjustable and extendable up to 288 bytes (depending on the interface module (IM) used).

Diagnostic information is accessed via automatic alarm messages, via the status information in the process image or data record reading in the user program, or via the graphical status display in the online diagnostics of the TIA Portal. The AS-i network's transmission quality can also be read out. To avoid configuration errors, duplicate addresses in the AS-i network can be detected.

Configuration is possible with SIMATIC CPUs S7-300 up to S7-1500 and with a SINUMERIK 840D sl or other controller.

The online diagnostic status of the AS-i slaves can be displayed directly on the slaves in the network view in TIA Portal (for S7-1500 CPUs with firmware version V 2.0 or higher).

### Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions represent only one component of such a concept.

For more information on Industrial Security, see <http://www.siemens.com/industrialsecurity>.

## Configuration

The following software is required for configuration of the CM AS-i Master ST module:

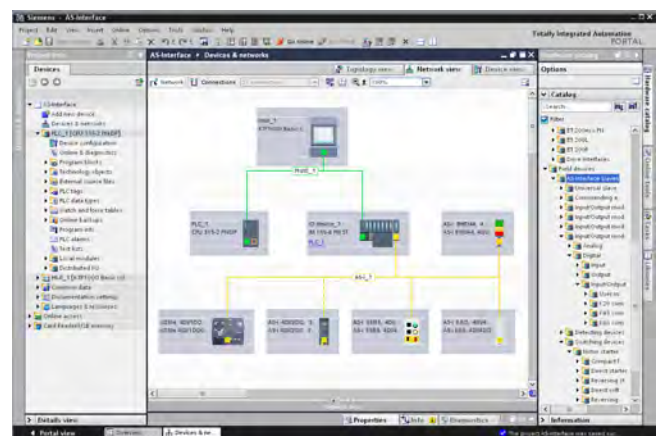
- STEP 7 (TIA Portal) or
- STEP 7 (Classic) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

STEP 7 enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration as the TARGET configuration at the "touch of a button" via the control panel integrated in the TIA Portal or an optional expansion button. Configuration with the GSD file is possible only with the button.

The CM AS-i Master ST module occupies up to 288 input bytes and up to 288 output bytes in the I/O data of the ET 200SP station. The I/O assignment depends on the configuration in STEP 7.

Together with an ET 200SP CPU 1510SP/1512SP or 1515SP PC, preprocessing of AS-i signals directly in the ET 200SP station and setting up of an independent AS-i station without a higher-level CPU are possible.



Configuration of an AS-Interface network with CM AS-i Master ST via the TIA Portal

## Benefits

The CM AS-i Master ST communications module for ET 200SP enables modular, simple and high-performance expansion of AS-interface networks via engineering in the TIA Portal.

Up to eight CM AS-i Master ST units can be plugged into one ET 200SP station with IM 155-6PN Standard. When using the IM 155-6 PN High Feature, the number of CM AS-i Master ST in the ET 200SP station can be further increased. The maximum configuration depends on the interface module used.

Multiple masters as well as single masters can thus be implemented in the ET 200SP depending on the number of modules.

Together with the interface module, a scalable PROFINET/AS-i Link or PROFIBUS/AS-i Link can be assembled.

Using STEP 7, the AS-i network is consistently configured and programmed with only one configuration tool.

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > Communication > CM AS-i Master ST for SIMATIC ET 200SP

#### Benefits

The PRONETA PC program (for ET 200SP with PROFINET interface module) is available for convenient input/output testing during the commissioning of an AS-i network without a CPU, see <http://www.siemens.com/proneta>.

For the connection of an AS-i network to systems with Ethernet/IP and Modbus TCP, the ET 200SP MultiFieldbus interface module IM155-6MF in combination with the CM AS-i Master ST module is available.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser,

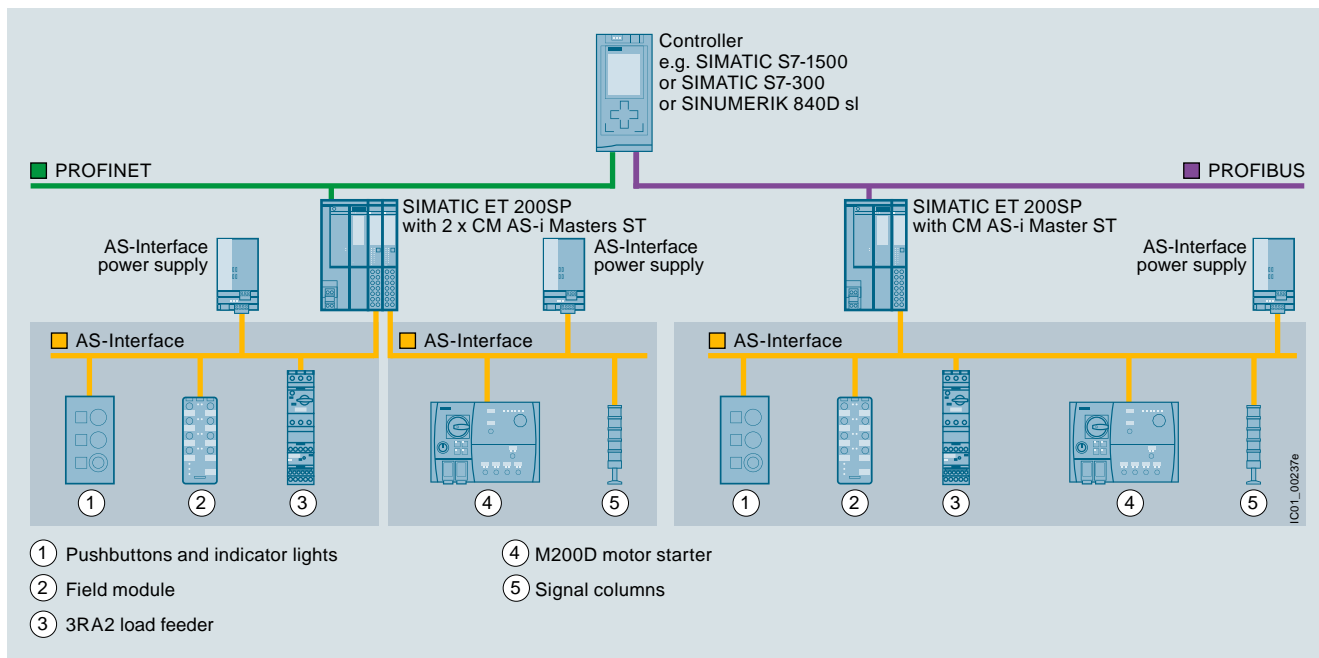
see <https://support.industry.siemens.com/cs/ww/en/view/109479103>.



Diagnostic block for CM AS-i Master ST

#### Application

##### Configuration examples of AS-Interface networks with CM AS-i Master ST for SIMATIC ET 200SP



Configuration of AS-Interface networks under a SIMATIC ET 200SP

Ordering data	Article No.	Article No.	
<b>CM AS-i Master ST communications module</b> <ul style="list-style-type: none"> <li>AS-Interface master for SIMATIC ET 200SP, can be plugged onto BaseUnit type C0</li> <li>Corresponds to AS-Interface specification V3.0</li> <li>Dimensions (W x H x D / mm): 20 x 73 x 58</li> </ul>	3RK7137-6SA00-0BC1	<b>PROFIBUS IM 155-6DP High Feature interface modules</b> <p>Max. 32 I/O modules, max. 244 bytes I/O data per station</p> <ul style="list-style-type: none"> <li>Including server module and PROFIBUS plug</li> </ul>	6ES7155-6BA01-0CN0
<b>Accessories</b>		<b>MultiFieldbus IM 155-6MF High Feature interface modules</b> <p>For operation on PROFINET, EtherNet/IP or Modbus TCP controllers, 1 slot for bus adapter, max. 64 I/O modules</p> <ul style="list-style-type: none"> <li>Including server module and optional strain relief (bus adapter must be ordered separately, <a href="#">see below</a>)</li> </ul> <p>For more information, <a href="https://support.industry.siemens.com/cs/ww/en/view/109779189">see https://support.industry.siemens.com/cs/ww/en/view/109779189</a>.</p>	6ES7155-6MU00-0CN0
<b>BaseUnit BU20-P6+A2+4D</b> <ul style="list-style-type: none"> <li>BaseUnit (light), BU type C0</li> <li>Suitable for the CM AS-i Master ST module</li> <li>For connection of AS-Interface cable to the CM AS-i Master ST</li> <li>Start of an AS-i network, isolation of the AS-i voltage from the left-hand module</li> <li>For spring-loaded terminals</li> </ul>	6ES7193-6BP20-0DC0	<b>Bus adapters for PROFINET/Ethernet</b> <p>For connection of the Ethernet cable to the PROFINET IM 155-6 PN interface module and the MultiFieldbus IM 155-6MF interface module</p> <ul style="list-style-type: none"> <li>Connection 2 x RJ45 (supplied without RJ45 plug)</li> <li>Connection 2 x FC (FastConnect)</li> </ul> <p>For more bus adapters with fiber optic cable connection, <a href="http://www.siemens.com/industryemail">see http://www.siemens.com/industryemail</a>.</p>	6ES7193-6AR00-0AA0 6ES7193-6AF00-0AA0
<b>PROFINET IM 155-6PN Basic interface modules</b> <p>Max. 12 I/O modules, max. 32 bytes I/O data per station</p> <ul style="list-style-type: none"> <li>Including server module and 2 x RJ45 ports (supplied without RJ45 plug)</li> </ul>	6ES7155-6AR00-0A00	<b>AS-interface addressing unit V3.0</b> <ul style="list-style-type: none"> <li>For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0</li> <li>For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves)</li> <li>With input/output test function and many other commissioning functions</li> <li>Battery operation with four batteries type AA (IEC LR6, NEDA 15)</li> <li>Degree of protection IP40</li> <li>Dimensions (W x H x D) mm: 84 x 195 x 35</li> <li>Scope of supply: <ul style="list-style-type: none"> <li>Addressing unit with 4 batteries</li> <li>Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m</li> </ul> </li> </ul>	3RK1904-2AB02
<b>PROFINET IM 155-6PN Standard interface modules</b> <p>Max. 32 I/O modules, max. 256 bytes I/O data per station</p> <ul style="list-style-type: none"> <li>Including server module and bus adapter 2 x RJ45 (supplied without RJ45 plug)</li> <li>Including server module (bus adapter must be ordered separately, <a href="#">see right</a>)</li> </ul>	6ES7155-6AA01-0BNO 6ES7155-6AU01-0BNO		
<b>PROFINET IM 155-6PN High Feature interface modules</b> <p>Max. 64 I/O modules, max. 1 440 bytes I/O data per station</p> <ul style="list-style-type: none"> <li><b>IM 155-6 PN/2 High Feature</b> IM with a bus adapter slot, including server module and optional strain relief (bus adapter must be ordered separately, <a href="#">see right</a>)</li> <li><b>IM 155-6 PN/3 High Feature</b> 3-port IM with two bus adapter slots, including server module and optional strain relief (bus adapter must be ordered separately, <a href="#">see right</a>)</li> </ul>	6ES7155-6AU01-0CN0 6ES7155-6AU30-0CN0		
<b>PROFINET IM 155-6PN High Speed interface modules</b> <p>Max. 30 I/O modules, max. 1 440 bytes I/O data per station</p> <ul style="list-style-type: none"> <li>Including server module (bus adapter must be ordered separately, <a href="#">see right</a>)</li> </ul>	6ES7155-6AU00-0DNO		

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > CM DP for ET 200SP CPU

### Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 Kbps to 12 Mbps
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication:
 

This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data set routing

### Ordering data

### Article No.

**CM DP for ET 200SP CPU** **6ES7545-5DA00-0AB0**

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

#### Accessories

**Equipment labeling plate** **6ES7193-6LF30-0AW0**

10 sheets of 16 labels

#### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer **6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer **6ES7193-6LR10-0AG0**

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer **6ES7193-6LA10-0AA0**

1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer **6ES7193-6LA10-0AG0**

#### PROFIBUS DP RS 485 bus connector

With 90° cable outlet, max. transfer rate 12 Mbps

- without PG interface **6ES7972-0BA12-0XA0**
- with PG interface **6ES7972-0BB12-0XA0**

With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps

- without PG interface, 1 unit **6ES7972-0BA52-0XA0**
- without PG interface, 100 units **6ES7972-0BA52-0XB0**
- with PG interface, 1 unit **6ES7972-0BB52-0XA0**
- with PG interface, 100 units **6ES7972-0BB52-0XB0**

**FastConnect bus cable** **6XV1830-0EH10**

Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

#### Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A **6ES7193-6KA00-3AA0**

Type B **6ES7193-6KB00-3AA0**

Type C **6ES7193-6KC00-3AA0**

Type D **6ES7193-6KD00-3AA0**

**Technical specifications**

Article number	<b>6ES7545-5DA00-0AB0</b> ET 200SP, cm DP for ET 200SP CPU
<b>General information</b>	
Product type designation	CM PROFIBUS DP
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V13 Update 3
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>1. Interface</b>	
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
<b>PROFIBUS DP master</b>	
• Number of DP slaves, max.	125
<b>Services</b>	
- PG/OP communication	Yes
- Equidistance	No
- Isochronous mode	No
- Activation/deactivation of DP slaves	Yes
<b>PROFIBUS DP slave</b>	
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	Yes
• Address area, max.	120
• User data per address area, max.	128 byte
<b>Services</b>	
- PG/OP communication	Yes; Only with active interface
- Routing	Yes; Only with active interface
- S7 communication	Yes; Only with active interface
- Direct data exchange (slave-to-slave communication)	Yes; No subscriber possible - only passive publisher
- DPV1	Yes
<b>Transfer memory</b>	
- Inputs	244 byte
- Outputs	244 byte
<b>RS 485</b>	
• Transmission rate, max.	12 Mbit/s
• Cable length, max.	100 m
<b>Protocols</b>	
<b>SIMATIC communication</b>	
• S7 routing	Yes
• Data record routing	Yes

Article number	<b>6ES7545-5DA00-0AB0</b> ET 200SP, cm DP for ET 200SP CPU
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• for module diagnostics	Yes; green/red DIAG LED
<b>Potential separation</b>	
between backplane bus and interface	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>	
Width	35 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	80 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1

### Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

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The CP 1542SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP for authentication on an email server (also with IPv6)
  - SNMPv1 for transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

### Ordering data

### Article No.

#### CP 1542SP-1 communications processor

6GK7542-6UX00-0XE0

For connection of SIMATIC S7 ET 200SP to Industrial Ethernet, open IE communication (TCP/IP, ISO-ON-TCP, UDP), PG/OP, S7 routing, IP broadcast/multicast, SNMPV1, DHCP, email, IPv4/IPv6, time synchronization via NTP, access to web server of CPU, bus adapter required

#### Accessories

**SIMATIC BusAdapter BA 2xRJ45**  
For PROFINET interface modules, standard function class or above; max. cable length 50 m

6ES7193-6AR00-0AA0

**SIMATIC BusAdapter BA 2xFC**  
For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m

6ES7193-6AF00-0AA0

**SIMATIC BusAdapter BA 2xSCRJ**  
For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)

6ES7193-6AP00-0AA0

**SIMATIC BusAdapter BA SCRJ/RJ45**  
For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)

6ES7193-6AP20-0AA0

**SIMATIC BusAdapter BA SCRJ/FC**  
For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)

6ES7193-6AP40-0AA0

Ordering data	Article No.	Article No.
<p><b>IE FC RJ45 plug 180 2 x 2</b></p> <p>RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface</p> <ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<p><b>6GK1901-1BB10-2AA0</b>  <b>6GK1901-1BB10-2AB0</b>  <b>6GK1901-1BB10-2AE0</b></p>	<p><b>Labeling strips</b></p> <p>500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer</p> <p><b>6ES7193-6LR10-0AA0</b></p> <p>500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer</p> <p><b>6ES7193-6LR10-0AG0</b></p> <p>1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer</p> <p><b>6ES7193-6LA10-0AA0</b></p> <p>1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer</p> <p><b>6ES7193-6LA10-0AG0</b></p>
<p><b>IE FC RJ45 plug 4 x 2</b></p> <p>RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface</p> <ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<p><b>6GK1901-1BB11-2AA0</b>  <b>6GK1901-1BB11-2AB0</b>  <b>6GK1901-1BB11-2AE0</b></p>	<p><b>Equipment labeling plate</b></p> <p>10 sheets of 16 labels, for printing with thermal transfer card printer or plotter</p> <p><b>6ES7193-6LF30-0AW0</b></p>
<p><b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b></p> <p>4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m</p>	<p><b>6XV1840-2AH10</b></p>	<p><b>Spare parts</b></p> <p><b>Server module</b></p> <p>Terminates an ET 200SP station; included in the scope of delivery of the interface modules</p> <p><b>6ES7193-6PA00-0AA0</b></p>
<p><b>IE FC TP Standard Cable GP 4 x 2</b></p> <p>8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m</p> <ul style="list-style-type: none"> <li>• AWG22, for connection to IE FC RJ45 Modular Outlet</li> <li>• AWG24, for connection to IE FC RJ45 plug 4 x 2</li> </ul>	<p><b>6XV1870-2E</b>  <b>6XV1878-2A</b></p>	<p><b>PE connection element for DIN rail 2000 mm</b></p> <p>20 units</p> <p><b>6ES7590-5AA00-0AA0</b></p>
<p><b>IE FC stripping tool</b></p> <p>Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables</p>	<p><b>6GK1901-1GA00</b></p>	<p><b>Power supply connector</b></p> <p>Spare part; for connecting the 24 V DC supply voltage; with push-in terminals</p> <p><b>6ES7193-4JB00-0AA0</b></p>

Note:

You can find order information for software for communication with PC systems in the Industry Mall under System connections – software overview

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; Communication &gt; CP 1542SP-1

**Technical specifications**

Article number	<b>6GK7542-6UX00-0XE0</b>
product type designation	CP 1542SP-1
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	19.2 ... 28.8 V
power loss [W]	6 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	-30 ... +50 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
width	60 mm
height	117 mm
depth	74 mm
net weight	0.18 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	2
• note	2 CPUs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible

Article number	<b>6GK7542-6UX00-0XE0</b>
product type designation	CP 1542SP-1
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum data volume	32
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	32
<b>product functions management, configuration, engineering</b>	
product function MIB support protocol is supported	Yes
• SNMP v1	Yes
• SNMP v3	No
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/ location designation	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes; via ET 200SP CPU
<b>product functions security</b>	
product function	
• blocking of communication via physical ports	Yes
<b>product functions time</b>	
product function SICLOCK support	Yes
product function pass on time synchronization protocol is supported	No
• NTP	Yes
• NTP (secure)	No
time synchronization	
• from NTP-server	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

10



### Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

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The CP 1543SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols (e.g. SNMPv3), the communications processor protects individual ET 200SP distributed controllers or even entire automation cells against unauthorized access.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions can be configured with STEP 7 Professional, V14 (TIA Portal) and higher.

The CP 1543SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
- Support of SINEMA Remote Connect with autoconfiguration
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

### Ordering data

### Article No.

#### CP 1543SP-1 communications processor

6GK7543-6WX00-0XE0

CP 1543SP-1 communications processor for connecting SIMATIC S7-ET 200SP to Industrial Ethernet, Security (firewall and VPN), open IE communication (TCP/IP, ISO-on-TCP, UDP) PG/OP, S7 routing, IP broadcast/multicast, SNMPV1/V3, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, bus adapter required

#### Accessories

##### SIMATIC BusAdapter BA 2xRJ45

6ES7193-6AR00-0AA0

For PROFINET interface modules, standard function class or above; max. cable length 50 m

##### SIMATIC BusAdapter BA 2xFC

6ES7193-6AF00-0AA0

For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m

##### SIMATIC BusAdapter BA 2xSCRJ

6ES7193-6AP00-0AA0

For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)

##### SIMATIC BusAdapter BA SCRJ/RJ45

6ES7193-6AP20-0AA0

For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)

##### SIMATIC BusAdapter BA SCRJ/FC

6ES7193-6AP40-0AA0

For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)

#### IE FC RJ45 plug 180 2 x 2

RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > CP 1543SP-1

**Ordering data****Article No.****IE FC RJ45 plug 4 x 2**

RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB11-2AA0**  
**6GK1901-1BB11-2AB0**  
**6GK1901-1BB11-2AE0**

**IE FC TP Standard Cable GP 2 x 2 (Type A)**

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

**6XV1840-2AH10**

**IE FC TP Standard Cable GP 4 x 2**

8-wire, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

- AWG22, for connection to IE FC RJ45 modular outlet
- AWG24, for connection to IE FC RJ45 plug 4 x 2

**6XV1870-2E**  
**6XV1878-2A**

**Article No.****IE FC stripping tool**

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**6GK1901-1GA00**

**Labeling strips**

500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer

**6ES7193-6LR10-0AG0**

1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer

**6ES7193-6LA10-0AA0**

1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer

**6ES7193-6LA10-0AG0**

**Equipment labeling plate**

10 sheets of 16 labels, for printing with thermal transfer card printer or plotter

**6ES7193-6LF30-0AW0**

**Spare parts****Server module**

Terminates an ET 200SP station; included in the scope of delivery of the interface modules

**6ES7193-6PA00-0AA0**

**PE connection element for DIN rail 2000 mm**

20 units

**6ES7590-5AA00-0AA0**

**Power supply connector**

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals

**6ES7193-4JB00-0AA0**

Note:

You can find order information for software for communication with PC systems in the Industry Mall under System connections – software overview

### Technical specifications

Article number	<b>6GK7543-6WX00-0XE0</b>
product type designation	CP 1543SP-1
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	19.2 ... 28.8 V
power loss [W]	6 W
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	-30 ... +50 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
width	60 mm
height	117 mm
depth	74 mm
net weight	0.18 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	2
• note	2 CPUs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum	32
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16

Article number	<b>6GK7543-6WX00-0XE0</b>
product type designation	CP 1543SP-1
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	32
<b>performance data IT functions</b>	
number of possible connections	
• as email client maximum	1
<b>product functions management, configuration, engineering</b>	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/ location designation	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes; via ET 200SP CPU
<b>product functions security</b>	
firewall version	stateful inspection
product function with VPN connection	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1
number of possible connections with VPN connection	4
product function	
• switch-off of non-required services	Yes
• blocking of communication via physical ports	Yes
• log file for unauthorized access	Yes
<b>product functions time</b>	
product function SICLOCK support	Yes
product function pass on time synchronization	No
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1 IRC

### Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

G...JK10...XX...50730

The CP 1542SP-1 IRC communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. In addition, control centers can be connected using various telecontrol protocols.

The CP is characterized by the following:

- Ethernet-based connection to TeleControl Server Basic, e.g. via Internet
- Ethernet-based connection to the control center via SINAUT ST7, IEC 60870-5-104 or DNP3 protocol
- Data transfer of measured values, control variable values or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 100,000 values ensures a secure database, even with temporary connection failures
- Clearly laid out LED signaling for fast and easy diagnostics
- Fast commissioning thanks to easy configuration using STEP 7

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 IRC supports the following communication services:

- Support of multiple telecontrol protocols such as SINAUT ST7, DNP3, IEC 60870-5-104 and TeleControl Basic
- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP or SMTPS with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Email transfer with addressing by program block
  - Email transfer via "Notifications" (alerts)
- Support of SINEMA Remote Connect with autoconfiguration

### Ordering data

### Article No.

#### CP 1542SP-1 IRC communications processor

6GK7542-6VX00-0XE0

CP 1542SP-1 IRC communications processor for connection of SIMATIC S7 ET 200SP to Industrial Ethernet, TeleControl Server Basic, IEC 60870-5-104 or DNP3 protocol to a control center; open IE communication (TCP/IP, ISO-on-TCP, UDP), IP broadcast/multicast, SNMPv1, DHCP, secure email, IPv4/IPv6, time synchronization via NTP, access to web server of CPU, bus adapter required

#### Accessories

**SIMATIC BusAdapter BA 2xRJ45**  
For PROFINET interface modules, standard function class or above; max. cable length 50 m

6ES7193-6AR00-0AA0

**SIMATIC BusAdapter BA 2xFC**  
For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m

6ES7193-6AF00-0AA0

**SIMATIC BusAdapter BA 2xSCRJ**  
For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)

6ES7193-6AP00-0AA0

**SIMATIC BusAdapter BA SCRJ/RJ45**  
For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)

6ES7193-6AP20-0AA0

**SIMATIC BusAdapter BA SCRJ/FC**  
For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)

6ES7193-6AP40-0AA0

#### IE FC RJ45 plug 180 2 x 2

RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0  
6GK1901-1BB10-2AB0  
6GK1901-1BB10-2AE0

Ordering data	Article No.	Article No.
<b>IE FC RJ45 plug 4 x 2</b> RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface <ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>6GK1901-1BB11-2AA0</b> <b>6GK1901-1BB11-2AB0</b> <b>6GK1901-1BB11-2AE0</b>	<b>Labeling strips</b> 500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer <b>6ES7193-6LR10-0AA0</b> 500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer <b>6ES7193-6LR10-0AG0</b> 1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer <b>6ES7193-6LA10-0AA0</b> 1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer <b>6ES7193-6LA10-0AG0</b>
<b>IE FC TP standard cable GP 2 x 2 (Type A)</b> 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. length per delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>	<b>Equipment labeling plate</b> 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter <b>6ES7193-6LF30-0AW0</b>
<b>IE FC TP standard cable GP 4 x 2</b> 8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. length per delivery unit 1 000 m, minimum order quantity 20 m <ul style="list-style-type: none"> <li>• AWG22, for connection to IE FC RJ45 Modular Outlet</li> <li>• AWG24, for connection to IE FC RJ45 plug 4 x 2</li> </ul>	<b>6XV1870-2E</b> <b>6XV1878-2A</b>	<b>Spare parts</b> <b>Server module</b> Terminates an ET 200SP station; included in the scope of delivery of the interface modules <b>6ES7193-6PA00-0AA0</b>
<b>IE FC stripping tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>	<b>PE connection element for DIN rail 2000 mm</b> 20 units <b>6ES7590-5AA00-0AA0</b> <b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage; with push-in terminals <b>6ES7193-4JB00-0AA0</b>

**Note:**

You can find order information for software for communication with PC systems in the Industry Mall under System connections – software overview

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**Technical specifications**

Article number	<b>6GK7542-6VX00-0XE0</b>
product type designation	CP 1542SP-1 IRC
<b>transfer rate</b>	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>interfaces</b>	
number of interfaces acc. to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	19.2 ... 28.8 V
power loss [W]	6 W

Article number	<b>6GK7542-6VX00-0XE0</b>
product type designation	CP 1542SP-1 IRC
<b>ambient conditions</b>	
ambient temperature	
• for vertical installation during operation	-30 ... +50 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
<b>design, dimensions and weights</b>	
width	60 mm
height	117 mm
depth	74 mm
net weight	0.18 kg
fastening method	
• 35 mm top hat DIN rail mounting	Yes

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Communication > CP 1542SP-1 IRC****Technical specifications**

Article number	<b>6GK7542-6VX00-0XE0</b>
product type designation	CP 1542SP-1 IRC
<b>product features, product functions, product components general</b>	
number of units	
• per CPU maximum	2
• note	2 CPs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible
<b>performance data open communication</b>	
number of possible connections for open communication	
• by means of T blocks maximum	32
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
<b>performance data S7 communication</b>	
number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
<b>performance data multi-protocol mode</b>	
number of active connections with multi-protocol mode	32
<b>performance data IT functions</b>	
number of possible connections	
• as email client maximum	1
<b>performance data telecontrol</b>	
suitability for use	
• node station	No
• substation	Yes
• TIM control center	No
control center connection	IEC 60870-5, DNP3, (Modbus TCP by block solutions of the CPU) capable control stations, connection to Telecontrol Server Basic and ST7 capable control station
• by means of a permanent connection	supported
• by means of demand-oriented connection	supported
• note	Connection to SCADA system by IEC 60870-5 104, DNP3, Telecontrol Server Basic and ST7 capable control center
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST7 protocol	Yes

Article number	<b>6GK7542-6VX00-0XE0</b>
product type designation	CP 1542SP-1 IRC
product function data buffering if connection is aborted	Yes; TCSB 64000 events, SINAUT ST7 32000 telegrams, DNP3 100000 events, IEC 60870-5 100000 events
number of data points per station maximum	1 500
number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
<b>product functions management, configuration, engineering</b>	
product function MIB support protocol is supported	Yes
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/ location designation	Yes
<b>product functions diagnostics</b>	
product function web-based diagnostics	Yes; via ET 200SP CPU
<b>product functions security</b>	
product function with VPN connection	SINEMA RC
product function	
• blocking of communication via physical ports	Yes
<b>product functions time</b>	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
• NTP (secure)	No
time synchronization	
• from NTP-server	Yes
• from control center	Yes
<b>standards, specifications, approvals hazardous environments</b>	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

### Overview



- Space-saving access point, suitable for applications where the device is to be mounted in the control cabinet

### Ordering data

### Article No.

Access Points SCALANCE W761	
IWLAN Access Point with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: Mounting hardware, 3-pin screw terminal for 24 V DC; manual on CD-ROM; German/English	
<b>SCALANCE W761-1 RJ45</b>	
IWLAN Access Point with one built-in wireless interface	
<ul style="list-style-type: none"> <li>• National approvals for operation outside the USA</li> <li>• National approvals for operation within the USA <sup>1)</sup></li> </ul>	<b>6GK5761-1FC00-0AA0</b> <b>6GK5761-1FC00-0AB0</b>
<b>Accessories</b>	
<b>IE FC RJ45 plug 180 2 x 2</b>	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
<ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
<b>IE FC Standard Cable GP 2 x 2</b>	<b>6XV1840-2AH10</b>
4-wire, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
<b>IE FC stripping tool</b>	<b>6GK1901-1GA00</b>
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
<b>Antennas and miscellaneous IWLAN accessories</b>	See Industrial Wireless LAN/accessories

<sup>1)</sup> Please note national approvals under <http://www.siemens.com/wireless-approvals>

### Technical specifications

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
product type designation	W761-1 RJ45
<b>transfer rate</b>	
transfer rate	
• with WLAN maximum	150 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	100 Mbit/s
<b>interfaces</b>	
number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>memory</b>	
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>interfaces wireless</b>	
number of radio cards permanently installed	1
number of electrical connections for external antenna(s)	1
type of electrical connection for external antenna(s)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
consumed current	
• at DC at 24 V typical	0.15 A
power loss [W]	
• at DC at 24 V typical	3.6 W
supply voltage 1	
• from terminal block	19.2 V
supply voltage 2	
• from terminal block	28.8 V
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
relative humidity at 25 °C without condensation	95 %
during operation maximum	
ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
protection class IP	IP20

<sup>1)</sup> Wireless approval in the USA

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Communication > SCALANCE W761 RJ45 for the control cabinet****Technical specifications**

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
product type designation	W761-1 RJ45
<b>design, dimensions and weights</b>	
width	50 mm
height	114 mm
depth	74 mm
width of the enclosure without antenna	50 mm
height of the enclosure without antenna	114 mm
depth of the enclosure without antenna	74 mm
net weight	0.13 kg
fastening method	
• S7-300 DIN rail mounting	No
• S7-1500 rail mounting	No
• 35 mm top hat DIN rail mounting	Yes
• wall mounting	No
<b>radio frequencies</b>	
operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals
<b>product features, product functions, product components general</b>	
product function Access Point Mode	Yes
product function client Mode	Yes
number of SSIDs	1
product function	
• iPCF Access Point	No
• iPCF client	No
• iPCF-MC Access Point	No
• iPCF-MC client	No
product function iREF	No
product function iPRP	No
<b>product functions management, configuration, engineering</b>	
number of manageable IP addresses in client	4
product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• operation with IWLAN controller	No
• operation with Enterasys WLAN controller	No
• forced roaming on IP down with IWLAN	Yes
• forced roaming on link down with IWLAN	Yes
• WDS	Yes

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
product type designation	W761-1 RJ45
protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
<b>product functions diagnostics</b>	
product function	
• PROFINET IO diagnosis	No
• link check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>product functions VLAN</b>	
product function	
• function VLAN with IWLAN	Yes
<b>product functions DHCP</b>	
product function	
• DHCP client	Yes
• DHCP server	Yes
• DHCP Option 82	Yes
<b>product functions redundancy</b>	
protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
<b>product functions security</b>	
product function	
• ACL - MAC-based	Yes
• management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
protocol is supported	
• SSH	Yes
• RADIUS	Yes

<sup>1)</sup> Wireless approval in the USA



## Technical specifications

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
product type designation	W761-1 RJ45
<b>product functions time</b>	
protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes
<b>standards, specifications, approvals</b>	
standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for safety from CSA and UL certificate of suitability	UL 60950-1, CSA C22.2 No. 60950-1
• EC Declaration of Conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• railway application in accordance with EN 50155	No
• railway application in accordance with EN 50121-4	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
product type designation	W761-1 RJ45
standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">http://www.siemens.com/wireless-approvals</a>
<b>standards, specifications, approvals</b>	
<b>marine classification</b>	
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• French marine classification society (BV)	No
• DNV GL	No
• Korean Register of Shipping (KRS)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
<b>standards, specifications, approvals</b>	
<b>hazardous environments</b>	
standard for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
certificate of suitability CCC for hazardous zone according to GB standard	Yes
<b>accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA

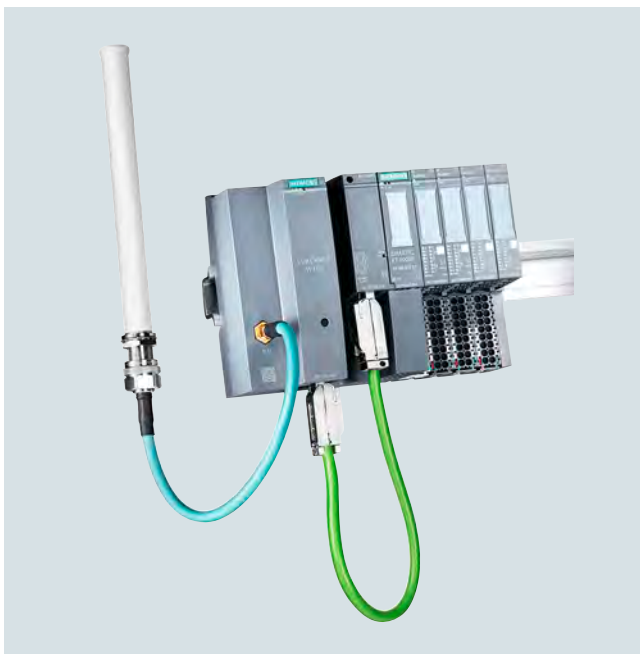
**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet

**Overview**

- Space-saving client module, suitable for applications where the device is to be mounted in the control cabinet
- Equipped with iFeatures



ET 200SP station with SCALANCE W722 RJ45

**Ordering data****Article No.****SCALANCE W722 Client Modules**

IWLAN Ethernet client modules with iFeatures support and built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of supply: Mounting hardware, 3-pole screw terminal for 24 V DC; manual on CD-ROM; German/English

**SCALANCE W722-1 RJ45**

For administration of a radio link with iFeatures from a connected device with Industrial Ethernet connection

- Country approvals for operation outside the USA
- Country approvals for operation within the USA<sup>1)</sup>
- National approvals for operation in Israel<sup>2)</sup>

**6GK5722-1FC00-0AA0**

**6GK5722-1FC00-0AB0**

**6GK5722-1FC00-0AC0**

**Accessories****IE FC RJ45 plug 180 2 x 2**

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**

**6GK1901-1BB10-2AB0**

**6GK1901-1BB10-2AE0**

**IE FC standard cable GP 2 x 2**

**6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; package item max. 1 000 m, minimum order quantity 20 m

**IE FC stripping tool**

**6GK1901-1GA00**

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**Antennas and miscellaneous IWLAN accessories**

See: Industrial Wireless LAN/accessories

<sup>1)</sup> Please note country approvals under:  
<http://www.siemens.com/wireless-approvals>

#### Technical specifications

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup> 6GK5722-1FC00-0AC0 <sup>2)</sup>
product type designation	W722-1 RJ45
<b>transfer rate</b>	
transfer rate	
• with WLAN maximum	150 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	100 Mbit/s
<b>interfaces</b>	
number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>memory</b>	
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>interfaces wireless</b>	
number of radio cards permanently installed	1
number of electrical connections for external antenna(s)	1
type of electrical connection for external antenna(s)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
consumed current	
• at DC at 24 V typical	0.15 A
power loss [W]	
• at DC at 24 V typical	3.6 W
supply voltage 1	
• from terminal block	19.2 V
supply voltage 2	
• from terminal block	28.8 V
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	95 %
ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
protection class IP	IP20

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup> 6GK5722-1FC00-0AC0 <sup>2)</sup>
product type designation	W722-1 RJ45
<b>design, dimensions and weights</b>	
width	50 mm
height	114 mm
depth	74 mm
width of the enclosure without antenna	50 mm
height of the enclosure without antenna	114 mm
depth of the enclosure without antenna	74 mm
net weight	0.13 kg
fastening method	
• S7-300 DIN rail mounting	No
• S7-1500 rail mounting	No
• 35 mm top hat DIN rail mounting	Yes
• wall mounting	No
<b>radio frequencies</b>	
operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals
<b>product features, product functions, product components general</b>	
product function Access Point Mode	No
product function client Mode	Yes
product function	
• iPCF client	Yes
• iPCF-MC client	Yes
number of iPCF-capable radio modules	1
product function iPRP	Yes
<b>product functions management, configuration, engineering</b>	
number of manageable IP addresses in client	4
product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• WDS	No
protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
identification & maintenance function	
• I&MO - device-specific information	Yes
• I&M1 – higher level designation/ location designation	Yes
<sup>1)</sup> Wireless approval in the USA <sup>2)</sup> Wireless approval in the Israel	

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet****Technical specifications**

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup> 6GK5722-1FC00-0AC0 <sup>2)</sup>
product type designation	W722-1 RJ45
<b>product functions diagnostics</b>	
product function	
• PROFINET IO diagnosis	Yes
• link check	No
• connection monitoring IP-Alive	No
• SysLog	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>product functions VLAN</b>	
product function	
• function VLAN with IWLAN	No
<b>product functions DHCP</b>	
product function	
• DHCP client	Yes
• DHCP server	Yes
• DHCP Option 82	Yes
<b>product functions redundancy</b>	
protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
<b>product functions security</b>	
product function	
• ACL - MAC-based	Yes
• management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	Yes
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
protocol is supported	
• SSH	Yes
• RADIUS	Yes
<b>product functions time</b>	
protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup> 6GK5722-1FC00-0AC0 <sup>2)</sup>
product type designation	W722-1 RJ45
<b>standards, specifications, approvals</b>	
standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for safety from CSA and UL certificate of suitability	UL 60950-1, CSA C22.2 No. 60950-1
• EC Declaration of Conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• railway application in accordance with EN 50155	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">http://www.siemens.com/wireless-approvals</a>
<b>standards, specifications, approvals marine classification</b>	
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• French marine classification society (BV)	No
• DNV GL	No
• Korean Register of Shipping (KRS)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
<b>standards, specifications, approvals hazardous environments</b>	
standard for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
certificate of suitability CCC for hazardous zone according to GB standard	Yes
<b>accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA<sup>2)</sup> Wireless approval in the Israel

## Overview



- Space-saving client module, suitable for applications where the device is to be mounted in the control cabinet

## Ordering data

## SCALANCE W721 Client Modules

IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C).  
Scope of supply:  
Mounting hardware, 3-pole screw terminal for 24 V DC; manual on CD-ROM; German/English

## SCALANCE W721-1 RJ45

For administration of a radio link from a connected device with Industrial Ethernet connection

- Country approvals for operation outside the USA
- Country approvals for operation within the USA<sup>1)</sup>

## Article No.

6GK5721-1FC00-0AA0

6GK5721-1FC00-0AB0

## Article No.

## Accessories

## IE FC RJ45 plug 180 2 x 2

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

## IE FC standard cable GP 2 x 2

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; package item max. 1 000 m, minimum order quantity 20 m

6XV1840-2AH10

## IE FC stripping tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

## Antennas and miscellaneous IWLAN accessories

See: Industrial Wireless LAN/accessories

<sup>1)</sup> Please note country approvals under:  
<http://www.siemens.com/wireless-approvals>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; Communication &gt; SCALANCE W721 RJ45 for the control cabinet

**Technical specifications**

Article number	<b>6GK5721-1FC00-0AA0</b> 6GK5721-1FC00-0AB0 <sup>1)</sup>
product type designation	W721-1 RJ45
<b>transfer rate</b>	
transfer rate	
• with WLAN maximum	150 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	100 Mbit/s
<b>interfaces</b>	
number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>memory</b>	
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>interfaces wireless</b>	
number of radio cards permanently installed	1
number of electrical connections for external antenna(s)	1
type of electrical connection for external antenna(s)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
consumed current	
• at DC at 24 V typical	0.15 A
power loss [W]	
• at DC at 24 V typical	3.6 W
supply voltage 1	
• from terminal block	19.2 V
supply voltage 2	
• from terminal block	28.8 V
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	95 %
ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
protection class IP	IP20

Article number	<b>6GK5721-1FC00-0AA0</b> 6GK5721-1FC00-0AB0 <sup>1)</sup>
product type designation	W721-1 RJ45
<b>design, dimensions and weights</b>	
width	50 mm
height	114 mm
depth	74 mm
width of the enclosure without antenna	50 mm
height of the enclosure without antenna	114 mm
depth of the enclosure without antenna	74 mm
net weight	0.13 kg
fastening method	
• S7-300 DIN rail mounting	No
• S7-1500 rail mounting	No
• 35 mm top hat DIN rail mounting	Yes
• wall mounting	No
<b>radio frequencies</b>	
operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals
<b>product features, product functions, product components general</b>	
product function Access Point Mode	No
product function client Mode	Yes
product function	
• iPCF client	No
• iPCF-MC client	No
product function iREF	No
product function iPRP	No
<b>product functions management, configuration, engineering</b>	
number of manageable IP addresses in client	4
product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• WDS	No
protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/ location designation	Yes

<sup>1)</sup> Wireless approval in the USA

#### Technical specifications

Article number	<b>6GK5721-1FC00-0AA0</b> 6GK5721-1FC00-0AB0 <sup>1)</sup>
product type designation	W721-1 RJ45
<b>product functions diagnostics</b>	
product function	
• PROFINET IO diagnosis	No
• link check	No
• connection monitoring IP-Alive	No
• SysLog	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>product functions VLAN</b>	
product function	
• function VLAN with IWLAN	No
<b>product functions DHCP</b>	
product function	
• DHCP client	Yes
• DHCP server	Yes
• DHCP Option 82	Yes
<b>product functions redundancy</b>	
protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
<b>product functions security</b>	
product function	
• ACL - MAC-based	Yes
• management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	Yes
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
protocol is supported	
• SSH	Yes
• RADIUS	Yes
<b>product functions time</b>	
protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes

Article number	<b>6GK5721-1FC00-0AA0</b> 6GK5721-1FC00-0AB0 <sup>1)</sup>
product type designation	W721-1 RJ45
<b>standards, specifications, approvals</b>	
standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for safety from CSA and UL certificate of suitability	UL 60950-1, CSA C22.2 No. 60950-1
• EC Declaration of Conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• railway application in accordance with EN 50155	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">http://www.siemens.com/wireless-approvals</a>
<b>standards, specifications, approvals marine classification</b>	
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• French marine classification society (BV)	No
• DNV GL	No
• Korean Register of Shipping (KRS)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
<b>standards, specifications, approvals hazardous environments</b>	
standard for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
certificate of suitability CCC for hazardous zone according to GB standard	Yes
<b>accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM PtP serial interface

### Overview



- Communications module CM PtP; Module for serial communication connections with RS232, RS422, RS485 interfaces for the Freeport, 3964(R), Modbus RTU and USS protocols, max. 115.2 kbps, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
  - Freeport: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU master (requires instructions in SIMATIC S7)
  - Modbus RTU slave (requires instructions in SIMATIC S7)
  - USS, implemented through instructions
- Interface properties
  - RS232 with auxiliary signals
  - RS422 for full-duplex connections
  - RS485 for half-duplex and multi-point connections
  - Transmission rates from 300 to 115200 bps
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation, and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the CM module type: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection

#### Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS CM PtP communications module

(Extended temperature range and exposure to environmental substances)

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps for serial communication connections with the interfaces RS232, RS422, RS485, BU type A0, color code CC00

6AG1137-6AA00-2BA0

#### Accessories

#### SIPLUS BaseUnits type A0

(Extended temperature range and exposure to environmental substances)

#### BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

#### BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

#### BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

#### BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

#### Accessories

#### SIPLUS Mounting Kit ET 200SP

Mounting accessories for use with increased mechanical vibration and shock loads.

6AG1193-6AA00-0AA0

#### Other accessories

See SIMATIC CM PtP, page 10/136



### Technical specifications

Article number	<b>6AG1137-6AA00-2BA0</b>
Based on	<b>6ES7137-6AA00-0BA0</b> SIPLUS ET 200SP CM PTP
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	<b>6AG1137-6AA00-2BA0</b>
Based on	<b>6ES7137-6AA00-0BA0</b> SIPLUS ET 200SP CM PTP
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM 4x IO-Link

### Overview



- SIPLUS CM 4x IO-Link communications module  
Serial communications module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher.
- Time-based IO  
Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or fluids dosed in precise quantities.
- Supported data transfer rates
  - COM1 (4.8 kBd)
  - COM2 (38.4 kBd)
  - COM3 (230.4 kBd)
- Expansion limits
  - Length of cable: Max. 20 m
  - Max. 32 bytes of input and output data per port
  - Max. 144 bytes of input data and 128 bytes of output data per module

- Supported ET 200SP system functions
  - Replacement without PG with automatic backup without the engineering tool of the IO-Link Device Parameter (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
  - Re-parameterization during operation
  - Identification data I&M
  - Firmware update
  - PROFlenergy
- Can be plugged into Type A0 BaseUnits (BU) with automatic e-coding
- LED indicators
  - DIAG: Operating state indicator (green/red) of the module
  - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
  - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
  - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
  - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color-coding of the module class CM: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional accessories
  - Labeling strips
  - Equipment labeling plate
  - Color-coded label with color code CC04
- Optional system-integrated shield connection

#### Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS CM 4x IO-Link master V1.1 Standard communications module</b>  (Extended temperature range and exposure to environmental substances)  Serial communications module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	<b>6AG1137-6BD00-2BA0</b>	<b>BU15-P16+A10+2B</b>  (Extended temperature range and exposure to environmental substances)  BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	<b>6AG1193-6BP20-7BA0</b>
<b>Usable type A0 BaseUnits</b>  <b>BU15-P16+A10+2D</b>  (Extended temperature range and exposure to environmental substances)  BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	<b>6AG1193-6BP20-7DA0</b>	<b>BU15-P16+A0+2B</b>  (Extended temperature range and exposure to environmental substances)  BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA0</b>
<b>BU15-P16+A0+2D</b>  (Extended temperature range and exposure to environmental substances)  BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA0</b>	<b>Accessories</b>  <b>SIPLUS Mounting Kit ET 200SP</b>  Mounting accessories for use with increased mechanical vibration and shock loads.	<b>6AG1193-6AA00-0AA0</b>
		<b>Other accessories</b>  See SIMATIC CM 4x IO-Link, page 10/140	

### Technical specifications

Article number	6AG1137-6BD00-2BA0	Article number	6AG1137-6BD00-2BA0
Based on	6ES7137-6BD00-0BA0 SIPLUS ET 200SP CM 4XIO-LINK	Based on	6ES7137-6BD00-0BA0 SIPLUS ET 200SP CM 4XIO-LINK
<b>Ambient conditions</b>		<b>Usage in industrial process technology</b>	
<b>Ambient temperature during operation</b>		- Against chemically active substances acc. to EN 60654-4	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	
• horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
<b>Altitude during operation relating to sea level</b>		<b>Remark</b>	
• Installation altitude above sea level, max.	5 000 m	- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	* The supplied plug covers must remain in place over the unused interfaces during operation!	
<b>Relative humidity</b>		<b>Conformal coating</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	• Coatings for printed circuit board assemblies acc. to EN 61086	
<b>Resistance</b>		• Protection against fouling acc. to EN 60664-3	
<b>Coolants and lubricants</b>		• Military testing according to MIL-I-46058C, Amendment 7	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	
<b>Use in stationary industrial systems</b>		Yes; Class 2 for high reliability	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Type 1 protection	
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Discoloration of coating possible during service life	
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Conformal coating, Class A	
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *		
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM DP for ET 200SP CPU

**Overview**

- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 kbps to 12 Mbps
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication:
    - This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data set routing

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.**

**SIPLUS CM DP for ET 200SP CPU** **6AG1545-5DA00-2AB0**

(Extended temperature range and exposure to environmental substances)

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

**Accessories**

**SIPLUS Mounting Kit ET 200SP** **6AG1193-6AA00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads.

**Other accessories**

see SIMATIC CM DP, page 10/150

### Technical specifications

Article number	6AG1545-5DA00-2AB0	Article number	6AG1545-5DA00-2AB0	
Based on	6ES7545-5DA00-0AB0 SIPLUS ET 200SP CM DP	Based on	6ES7545-5DA00-0AB0 SIPLUS ET 200SP CM DP	
<b>Ambient conditions</b>		<b>Usage in industrial process technology</b>		
<b>Ambient temperature during operation</b>		<ul style="list-style-type: none"> <li>- Against chemically active substances acc. to EN 60654-4</li> <li>- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>		
• horizontal installation, min.				-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.				70 °C; = Tmax
• vertical installation, min.		-40 °C; = Tmin (incl. condensation/frost)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
• vertical installation, max.		50 °C; = Tmax		
<b>Altitude during operation relating to sea level</b>		<b>Remark</b>		
• Installation altitude above sea level, max.		- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04		
• Ambient air temperature-barometric pressure-altitude		* The supplied plug covers must remain in place over the unused interfaces during operation!		
Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)		<b>Conformal coating</b>		
<b>Relative humidity</b>		• Coatings for printed circuit board assemblies acc. to EN 61086		
• With condensation, tested in accordance with IEC 60068-2-38, max.		• Protection against fouling acc. to EN 60664-3		
100 %; RH incl. condensation/frost (no commissioning under condensation conditions)		• Military testing according to MIL-I-46058C, Amendment 7		
<b>Resistance</b>		• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A		
<b>Coolants and lubricants</b>		Yes; Class 2 for high reliability		
- Resistant to commercially available coolants and lubricants		Yes; Type 1 protection		
Yes; Incl. diesel and oil droplets in the air		Yes; Discoloration of coating possible during service life		
<b>Use in stationary industrial systems</b>		Yes; Conformal coating, Class A		
- to biologically active substances according to EN 60721-3-3		Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request		
- to chemically active substances according to EN 60721-3-3		Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		
- to mechanically active substances according to EN 60721-3-3		Yes; Class 3S4 incl. sand, dust, *		
- Against mechanical environmental conditions acc. to EN 60721-3-3		Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		
<b>Use on ships/at sea</b>		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		
- to biologically active substances according to EN 60721-3-6		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		
- to chemically active substances according to EN 60721-3-6		Yes; Class 6S3 incl. sand, dust; *		
- to mechanically active substances according to EN 60721-3-6		Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		
- Against mechanical environmental conditions acc. to EN 60721-3-6				

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-input modules

### Overview



SIMATIC ET 200SP Safety F-DI video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6151017420001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6151017420001)



Digital fail-safe input module:  
F-DI 8x24 V DC High Feature for BU type A0, color code CC01

Important features:

- 8-channel digital fail-safe input module for ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integrated discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into Type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

### Ordering data

#### Digital F-input modules

F-DI 8x24VDC High Feature,  
BU type A0, color code CC01

### Article No.

**6ES7136-6BA00-0CA0**

#### Spare parts

#### E-coding element type F

5 units, for ET 200SP F-DI, F-DQ,  
F-PM E, F-AI 4x1

**6ES7193-6EF00-1AA0**

#### Suitable BaseUnits

#### BU15-P16+A10+2D

BU type A0; BaseUnit (light)  
with 16 push-in terminals (1 ... 16)  
to the module and an additional  
10 internally jumpered  
AUX terminals (1 A to 10 A);  
for starting a new load group  
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0**

### Article No.

#### BU15-P16+A0+2D

BU type A0; BaseUnit (light)  
with 16 push-in terminals to the  
module; for starting a new load  
group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

#### 2BU15-P16+A0+2DB

Double BaseUnit for  
holding 2 I/O modules;  
BU type A0; BaseUnit (light/dark)  
with 16 push-in terminals to the  
module; for starting a new load  
group (max. 10 A)

- Pack of 1 unit

**6ES7193-6BP60-0DA0**

Ordering data	Article No.	Ordering data	Article No.
<b>BU15-P16+A10+2B</b> BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group <ul style="list-style-type: none"> <li>• Pack of 1 unit</li> <li>• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.</li> </ul>	<b>6ES7193-6BP20-0BA0</b> <b>6ES7193-6BP20-2BA0</b>	<b>STEP 7 Safety Advanced V17</b> <b>Task:</b> Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco <b>Requirement:</b> STEP 7 Professional V17 <b>Note:</b> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case. Floating license for 1 user; license key on USB flash drive Floating license for 1 user; license key for download <sup>1)</sup> ; Email address required for delivery	<b>6ES7833-1FA17-0YA5</b> <b>6ES7833-1FA17-0YH5</b>
<b>BU15-P16+A0+2B</b> BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group <ul style="list-style-type: none"> <li>• Pack of 1 unit</li> <li>• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.</li> </ul>	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>	<b>Equipment labeling plate</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>
<b>2BU15-P16+A0+2B</b> Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group <ul style="list-style-type: none"> <li>• Pack of 1 unit</li> </ul>	<b>6ES7193-6BP60-0BA0</b>	<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer 1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LR10-0AA0</b> <b>6ES7193-6LR10-0AG0</b> <b>6ES7193-6LA10-0AA0</b> <b>6ES7193-6LA10-0AG0</b>
<b>Accessories</b> <b>S7 Distributed Safety V5.4 SP5 Update 2 programming tool</b> <b>Task:</b> Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP <b>Requirement:</b> Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version Floating license for 1 user; software and documentation on DVD; license key on USB flash drive Floating license for 1 user; software, documentation and license key for download <sup>1)</sup> ; Email address required for delivery	<b>6ES7833-1FC02-0YA5</b> <b>6ES7833-1FC02-0YH5</b>	<b>BU cover</b> For covering empty slots (gaps); 5 units <ul style="list-style-type: none"> <li>• 15 mm wide</li> <li>• 20 mm wide</li> </ul>	<b>6ES7133-6CV15-1AM0</b> <b>6ES7133-6CV20-1AM0</b>
<b>S7 Distributed Safety upgrade</b> From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	<b>6ES7833-1FC02-0YE5</b>	<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>
		<b>Color-coded labels</b> <ul style="list-style-type: none"> <li>• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units</li> <li>• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units</li> <li>• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units</li> <li>• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units</li> <li>• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units</li> </ul>	<b>6ES7193-6CP01-2MA0</b> <b>6ES7193-6CP01-4MA0</b> <b>6ES7193-6CP71-2AA0</b> <b>6ES7193-6CP72-2AA0</b> <b>6ES7193-6CP73-2AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Fail-safe I/O modules > Digital F-input modules****Technical specifications**

Article number	<b>6ES7136-6BA00-0CA0</b> ET 200SP, EI-Mod., F-DI 8x24VDC HF
<b>General information</b>	
Product type designation	F-DI 8x24VDC HF
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V12
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFINET from GSD version/ GSD revision	V2.31
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	8
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
<b>Output current</b>	
• up to 60 °C, max.	0.3 A
<b>24 V encoder supply</b>	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	800 mA; Total current of all encoders
<b>Digital inputs</b>	
Number of digital inputs	8
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal *0*	-30 to +5 V
• for signal *1*	+15 to +30 V
<b>Input current</b>	
• for signal *1*, typ.	3.7 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- parameterizable	Yes
<b>for technological functions</b>	
- parameterizable	No

Article number	<b>6ES7136-6BA00-0CA0</b> ET 200SP, EI-Mod., F-DI 8x24VDC HF
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	4 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	49 g

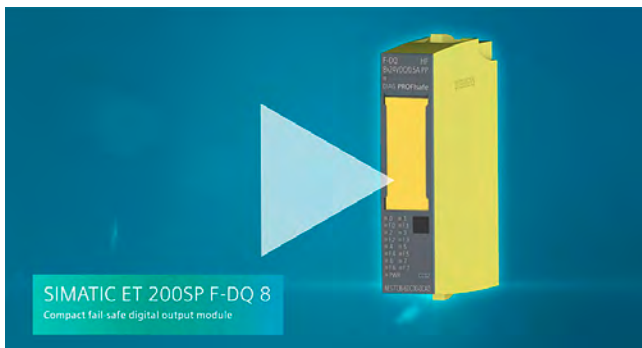


## Overview



**SIMATIC ET 200SP F-DQ 4**  
Compact fail-safe digital output module

SIMATIC ET 200SP Safety F-DQ 4 video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6154332510001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6154332510001)



**SIMATIC ET 200SP F-DQ 8**  
Compact fail-safe digital output module

SIMATIC ET 200SP Safety F-DQ 8 video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6154329323001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6154329323001)



Digital fail-safe output modules:

- F-DQ 4x24VDC/2A PM High Feature
- F-DQ 8x24VDC/0.5A PP High Feature

Important features:

- 4 and 8-channel digital fail-safe output modules for the ET 200SP
- Fail-safe 2-channel activation (switching to P/M potential or switching to P/P potential) of actuators
- Actuators can be controlled up to 2 A or 0.5 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into Type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DQ module type: black
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations
- They can be used with all fail-safe SIMATIC S7 CPUs

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Fail-safe I/O modules > Digital F-output modules**

Ordering data	Article No.	Article No.
<b>Digital F-output modules</b>		<b>6ES7193-6BP20-0BB0</b>
F-DQ 4x24VDC High Feature, BU type A0, color code CC01	<b>6ES7136-6DB00-0CA0</b>	BU type B0; BaseUnit (dark) with 12 push-in terminals (1 ... 12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group
F-DQ 8x24VDC High Feature, switching to P/P potential, BU type A0, color code CC01	<b>6ES7136-6DC00-0CA0</b>	
<b>Spare parts</b>		<b>Accessories</b>
<b>E-coding element type F</b>	<b>6ES7193-6EF00-1AA0</b>	<b>S7 Distributed Safety V5.4 SP5 Update 2 programming tool</b>
5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI		<b>Task:</b> Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200SP, ET 200pro, ET 200eco, ET 200SP
<b>Suitable BaseUnits</b>		<b>Requirement:</b> Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version
<b>BU15-P16+A10+2D</b>	<b>6ES7193-6EF00-1AA0</b>	Floating license for 1 user; software and documentation on DVD; license key on USB flash drive
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)		Floating license for 1 user; software, documentation and license key for download <sup>1)</sup> ; Email address required for delivery
<ul style="list-style-type: none"> <li>• Pack of 1 unit</li> <li>• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.</li> </ul>	<b>6ES7193-6BP20-0DA0</b> <b>6ES7193-6BP20-2DA0</b>	
<b>BU15-P16+A0+2D</b>		<b>S7 Distributed Safety upgrade</b>
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)		From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive
<ul style="list-style-type: none"> <li>• Pack of 1 unit</li> <li>• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.</li> </ul>	<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP00-2DA0</b>	<b>STEP 7 Safety Advanced V17</b>
<b>2BU15-P16+A0+2DB</b>		<b>Task:</b> Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)		<b>Requirement:</b> STEP 7 Professional V17
<ul style="list-style-type: none"> <li>• Pack of 1 unit</li> </ul>	<b>6ES7193-6BP60-0DA0</b>	<b>Note:</b> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.
<b>BU15-P16+A10+2B</b>		Floating license for 1 user; license key on USB flash drive
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group		Floating license for 1 user; license key for download <sup>1)</sup> ; Email address required for delivery
<ul style="list-style-type: none"> <li>• Pack of 1 unit</li> <li>• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.</li> </ul>	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>	
<b>BU15-P16+A0+2B</b>		
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group		
<ul style="list-style-type: none"> <li>• Pack of 1 unit</li> <li>• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.</li> </ul>	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>	
<b>2BU15-P16+A0+2B</b>		
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group		
<ul style="list-style-type: none"> <li>• Pack of 1 unit</li> </ul>	<b>6ES7193-6BP60-0BA0</b>	

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Article No.
<b>Equipment labeling plate</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>	<b>Color-coded labels</b> <ul style="list-style-type: none"> <li>Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units</li> <li>Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units</li> <li>Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units</li> <li>Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units</li> <li>Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units</li> </ul>
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>	
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>	
<b>BU cover</b> For covering empty slots (gaps); 5 units <ul style="list-style-type: none"> <li>15 mm wide</li> <li>20 mm wide</li> </ul>	<b>6ES7133-6CV15-1AM0</b> <b>6ES7133-6CV20-1AM0</b>	
<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>	

**Technical specifications**

Article number	<b>6ES7136-6DB00-0CA0</b> ET 200SP, EI-Mod., F-DQ 4xDC 24V/2A	<b>6ES7136-6DC00-0CA0</b> ET 200SP, F-DQ 8x 24VDC/0.5A PP
<b>General information</b>		
Product type designation	F-DQ 4x24 V DC/2A HF	F-DQ 8x24 V DC/0.5 A PP HF
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/integrated from version	V12	V14 SP1 with HSP 202
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP4 HF5
• PROFINET from GSD version/GSD revision	V2.31	V2.31
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
<b>Digital outputs</b>		
Number of digital outputs	4	8
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes	No
Overload protection	Yes	
Limitation of inductive shutdown voltage to	Typ. -2x 47 V	Typ. -39 V
Controlling a digital input		Yes
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	2 A	0.5 A
• on lamp load, max.	10 W	2 W
<b>Load resistance range</b>		
• lower limit	12 Ω	48 Ω
• upper limit	2 000 Ω	12 000 Ω
<b>Output voltage</b>		
• for signal "1", min.	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)
<b>Output current</b>		
• for signal "1" rated value	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Fail-safe I/O modules > Digital F-output modules****Technical specifications**

Article number	<b>6ES7136-6DB00-0CA0</b> ET 200SP, EI-Mod., F-DQ 4xDC 24V/2A	<b>6ES7136-6DC00-0CA0</b> ET 200SP, F-DQ 8x 24VDC/0.5A PP
<b>Switching frequency</b>		
• with resistive load, max.	30 Hz; Symmetrical	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• with capacitive load, max.		2 Hz; Symmetrical
• on lamp load, max.	10 Hz; Symmetrical	10 Hz; Symmetrical
<b>Total current of the outputs</b>		
• Current per channel, max.	2 A; note derating data in the manual	0.5 A; note derating data in the manual
• Current per module, max.	6 A; note derating data in the manual	3 A; note derating data in the manual
<b>Total current of the outputs (per module)</b>		
<b>horizontal installation</b>		
- up to 40 °C, max.		3 A
- up to 50 °C, max.		2.5 A
- up to 60 °C, max.		2 A
<b>vertical installation</b>		
- up to 50 °C, max.		2 A
<b>Cable length</b>		
• shielded, max.	1 000 m	100 m
• unshielded, max.	500 m	100 m
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
Substitute values connectable	No	No
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Standards, approvals, certificates</b>		
Suitable for safety functions	Yes	Yes
<b>Highest safety class achievable in safety mode</b>		
• Performance level according to ISO 13849-1	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	4 000 m; Restrictions for installation altitudes > 2 000 m, see manual	4 000 m; with derating
<b>Dimensions</b>		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
<b>Weights</b>		
Weight, approx.	57 g	48 g

## Overview



The digital F electronic module relay 1 F-RQ DC 24VDC/24.230VAC/5 A has the following characteristics:

- 1 relay output (2 NO contacts)
- Total output current 5 A
- Rated load voltage 24 V DC and 24 ... 230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals

The attainable safety integrity level is SIL 3 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

## Ordering data

**Digital F output module relay 1 F-RQ**

BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24 ... 230 V AC; can be used up to SIL 3/Cat. 4/PLe if controlled via F-DQ

## Article No.

6ES7136-6RA00-0BF0

**Suitable BaseUnits****BU20-P8+A4+0B**

BU type F0; BaseUnit (dark) with 8 process terminals to the module and 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group

6ES7193-6BP20-0BF0

**Accessories****S7 Distributed Safety V5.4 SP5 Update 2 programming tool****Task:**

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

**Requirement:**

Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version

Floating license for 1 user; software and documentation on DVD; license key on USB flash drive

6ES7833-1FC02-0YA5

Floating license for 1 user; software, documentation and license key for download<sup>1)</sup>; Email address required for delivery

6ES7833-1FC02-0YH5

## Article No.

**S7 Distributed Safety upgrade**

From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive

6ES7833-1FC02-0YE5

**STEP 7 Safety Advanced V17****Task:**

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco

**Requirement:**

STEP 7 Professional V17

**Note:**

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA17-0YA5

Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery

6ES7833-1FA17-0YH5

**Equipment labeling plate**

10 sheets of 16 labels

6ES7193-6LF30-0AW0

**Labeling strips**

500 labeling strips on roll, light gray

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow

6ES7193-6LR10-0AG0

1 000 labeling strips DIN A4, light gray

6ES7193-6LA10-0AA0

1 000 labeling strips DIN A4, yellow

6ES7193-6LA10-0AG0

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Fail-safe I/O modules > Digital F-output module relay**

Ordering data	Article No.	Article No.
<b>BU cover</b> For covering empty slots (gaps); 5 units • 20 mm wide	<b>6ES7133-6CV15-1AM0</b>	
<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>	
<b>Color-coded labels</b> • Color code CC42, module-specific; for BaseUnit type F0; 10 units	<b>6ES7193-6CP42-2MB0</b>	
		<b>Mechanical coding elements</b> For automatic coding of I/O modules; spare part. 20 units  Type A Type B Type C Type D
		<b>6ES7193-6KA00-3AA0</b> <b>6ES7193-6KB00-3AA0</b> <b>6ES7193-6KC00-3AA0</b> <b>6ES7193-6KD00-3AA0</b>

**Technical specifications**

Article number	<b>6ES7136-6RA00-0BF0</b> ET 200SP, F-RQ 1x24VDC/ 24..230VAC/5A ST
<b>General information</b>	
Product type designation	F-RQ 24 ... 48VDC/24 ... 230VAC/5A ST
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V13
• STEP 7 configurable/integrated from version	V5.5 SP4 and higher
• PROFINET from GSD version/ GSD revision	V2.31
<b>Supply voltage</b>	
Rated value (DC)	24 V; Coil voltage
<b>Digital outputs</b>	
Number of digital outputs	1
Limitation of inductive shutdown voltage to	No
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	5 A
• on lamp load, max.	25 W
<b>Switching frequency</b>	
• with resistive load, max.	2 Hz
• with inductive load, max.	0.1 Hz; See data in manual
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.1 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	2 Hz
<b>Total current of the outputs (per module)</b>	
<b>horizontal installation</b>	
- up to 40 °C, max.	5 A; note derating data in the manual
- up to 50 °C, max.	4 A; note derating data in the manual
- up to 60 °C, max.	3 A; note derating data in the manual
<b>vertical installation</b>	
- up to 50 °C, max.	3 A; note derating data in the manual
<b>Relay outputs</b>	
• Number of relay outputs	1; 2 NO contacts
• Rated supply voltage of relay coil L+ (DC)	24 V
• Current consumption of relays (coil current of all relays), max.	70 mA
• external protection for relay outputs	yes; 6 A, see data in manual
• Relay approved acc. to UL 508	Yes; Pilot Duty B300, R300

Article number	<b>6ES7136-6RA00-0BF0</b> ET 200SP, F-RQ 1x24VDC/ 24..230VAC/5A ST
<b>Switching capacity of contacts</b>	
- with inductive load, max.	see additional description in the manual
- with resistive load, max.	see additional description in the manual
- Thermal continuous current, max.	5 A
- Switching current, min.	1 mA
- Switching current after exceeding 300 mA, min.	10 mA
- Switching current after exceeding 300 mA, max.	5 A
- Rated switching voltage (DC)	24 V
- Rated switching voltage (AC)	230 V
<b>Cable length</b>	
• shielded, max.	500 m; for load contacts
• unshielded, max.	300 m; for load contacts
• Control cable (input), max.	10 m
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green/red DIAG LED
• Channel status display	Yes; green LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	56 g

## Overview



SIMATIC ET 200SP Safety F-AI-4xU video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6204918698001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6204918698001)



SIMATIC ET 200SP Safety F-AI-4xI video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6204919583001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6204919583001)



Analog fail-safe input modules:

- F-AI 4xI 0(4)...20 mA 2/4-wire High Feature for BU types A0 and A1, color code CC00
- F-AI 4xU 0..10 V HF, BU type A0, A1, color code CC00

Important features:

- 4-channel analog fail-safe digital inputs for ET 200SP
- 4 analog inputs with galvanic isolation between channels and backplane bus
- Measuring ranges: (0)4...20 mA and 0..10 V
- Possibility of connecting current and voltage sensors for measuring temperature, pressure, flow, level, distance measurement, etc.

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## Ordering data

## Analog F-input module

F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature, BU type A0, A1, color code CC00

## Article No.

6ES7136-6AA00-0CA1

F-AI 4xU 0..10 V High Feature, BU type A0, A1, color code CC00

6ES7136-6AB00-0CA1

## Spare parts

**E-coding element type F**  
5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI

6ES7193-6EF00-1AA0

**5x E-coding element type H**  
5 units, for ET 200SP F-AI 4xU, F-TM Count, F-CM AS-i

6ES7193-6EH00-1AA0

## Suitable BaseUnits

## BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP20-0DA0  
6ES7193-6BP20-2DA0

## Article No.

## BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0DA0  
6ES7193-6BP00-2DA0

## 2BU15-P16+A0+2DB

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit

6ES7193-6BP60-0DA0

## BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP20-0BA0  
6ES7193-6BP20-2BA0

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

**Fail-safe I/O modules > Analog F-input modules****Ordering data****Article No.****BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0**

**2BU15-P16+A0+2B**

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group

- Pack of 1 unit

**6ES7193-6BP60-0BA0**

**BU15-P16+A0+12D/T**

BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)

**6ES7193-6BP40-0DA1**

**BU15-P16+A0+2D/T**

BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

**6ES7193-6BP00-0DA1**

**BU15-P16+A0+12B/T**

BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group

**6ES7193-6BP40-0BA1**

**BU15-P16+A0+2B/T**

BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

**6ES7193-6BP00-0BA1**

**Article No.****Accessories****STEP 7 Safety Advanced V17****Task:**

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

**Requirement:**

STEP 7 Professional V17

**Note:**

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

**6ES7833-1FA17-0YA5**

Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery

**6ES7833-1FA17-0YH5**

**Equipment labeling plate**

10 sheets of 16 labels

**6ES7193-6LF30-0AW0**

**Labeling strips**

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AG0**

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer

**6ES7193-6LA10-0AA0**

1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer

**6ES7193-6LA10-0AG0**

**BU cover**

For covering empty slots (gaps); 5 units

- 15 mm wide

**6ES7133-6CV15-1AM0**

**Shield connection**

5 shield supports and 5 shield terminals

**6ES7193-6SC00-1AM0**

**Color-coded labels**

- Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); A1; 10 units

**6ES7193-6CP00-2MA0**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



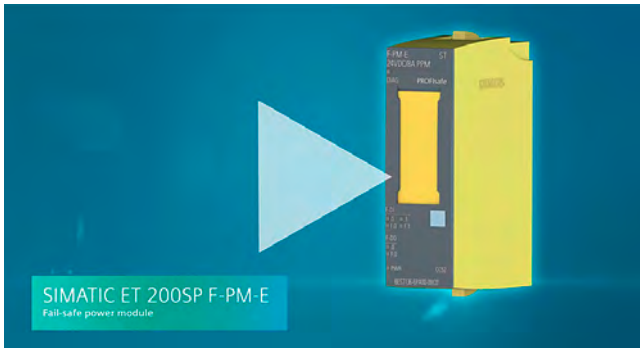
#### Technical specifications

Article number	<b>6ES7136-6AA00-0CA1</b> ET 200SP, F-AI 4XI (0)4..20mA HF	<b>6ES7136-6AB00-0CA1</b> ET 200SP, F-AI 4xU 0..10V HF
<b>General information</b>		
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	V15 with HSP 203	V16 with HSP 308
<b>Operating mode</b>		
• cyclic measurement		Yes
• Oversampling		No
• MSI		No
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
<b>Analog inputs</b>		
Number of analog inputs	4	4
• For current measurement	4	
• For voltage measurement		4
permissible input voltage for voltage input (destruction limit), max.		35 V
permissible input current for current input (destruction limit), max.	35 mA	
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V		Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Cable length</b>		
• shielded, max.	1 000 m	200 m
<b>Analog value generation for the inputs</b>		
Measurement principle	Sigma Delta	Sigma Delta
<b>Integration and conversion time/ resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes
<b>Smoothing of measured values</b>		
• Number of smoothing levels	7	7
• parameterizable	Yes	Yes
• Average value filter		Yes
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for voltage measurement		Yes
• for current measurement as 2-wire transducer	Yes	
- Burden of 2-wire transmitter, max.	650 Ω	
• for current measurement as 4-wire transducer	Yes	
<b>Errors/accuracies</b>		
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input range, (+/-)		0.1 %
• Current, relative to input range, (+/-)	0.1 %	

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Fail-safe I/O modules > Analog F-input modules****Technical specifications**

Article number	<b>6ES7136-6AA00-0CA1</b> ET 200SP, F-AI 4XI (0)4..20mA HF	<b>6ES7136-6AB00-0CA1</b> ET 200SP, F-AI 4xU 0..10V HF
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 = \text{interference frequency}</math></b>		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• Common mode voltage, max.		10 V
• Common mode interference, min.	70 dB	70 dB
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	No	No
<b>Diagnoses</b>		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes	Yes
• Short-circuit	Yes	
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Standards, approvals, certificates</b>		
<b>Highest safety class achievable in safety mode</b>		
• Performance level according to ISO 13849-1	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C
<b>Dimensions</b>		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
<b>Weights</b>		
Weight, approx.	48 g	48 g

## Overview



SIMATIC ET 200SP Safety F-PM-E video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6154262749001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6154262749001)



Digital fail-safe power module:  
 F-PM-E PPM 24 V DC/8 A for BU type C0,  
 color code CC52

Important features:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (switching to PPM potential, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply switching to PP or PM potential can be parameterized
- Parameterizable onboard evaluation of the fail-safe inputs for control of the fail-safe digital outputs and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Fail-safe I/O modules > Special fail-safe modules

Ordering data	Article No.		Article No.
<b>Digital F power module F-PM-E 24 V DC/8 A PPM Standard</b> BU type C0, color code CC52. 2 inputs, 1 output, SIL 3/Cat. 4/PL e	<b>6ES7136-6PA00-0BC0</b>	<b>BU cover</b> For covering empty slots (gaps); 5 units • 20 mm wide	<b>6ES7133-6CV20-1AM0</b>
<b>Spare parts</b>		<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>
<b>E-coding element type F</b> 5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4x1	<b>6ES7193-6EF00-1AA0</b>	<b>Color-coded labels</b> • Color code CC52, module-specific, for 8 push-in terminals; 10 units	<b>6ES7193-6CP52-2MC0</b>
<b>Suitable BaseUnits</b>		<b>Mechanical coding elements</b> For automatic coding of I/O modules; spare part. 20 units  Type A Type B Type C Type D	
<b>Type C0 BaseUnits</b>			
<b>BU20-P6+A2+4D</b> BU type C0; BaseUnit (light) with 6 push-in terminals (1 ... 6) to the module and 2 AUX terminals; new load group	<b>6ES7193-6BP20-0DC0</b>		<b>6ES7193-6KA00-3AA0</b>
<b>Accessories</b>			<b>6ES7193-6KB00-3AA0</b>
<b>Equipment labeling plate</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>		<b>6ES7193-6KC00-3AA0</b>
<b>Labeling strips</b> 1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>		<b>6ES7193-6KD00-3AA0</b>

### Technical specifications

Article number	6ES7136-6PA00-0BC0
	ET 200SP, Powermod. F-PM-E PPM, 24V DC
<b>General information</b>	
Product type designation	F-PM-E 24 V DC/8 A PPM ST
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V12
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFINET from GSD version/ GSD revision	V2.31
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	2
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 2.1 A)
<b>Output current</b>	
• up to 60 °C, max.	0.3 A
<b>24 V encoder supply</b>	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	600 mA; Total current of all encoders
<b>Digital inputs</b>	
Number of digital inputs	2
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes

Article number	6ES7136-6PA00-0BC0
	ET 200SP, Powermod. F-PM-E PPM, 24V DC
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
<b>Input current</b>	
• for signal "1", typ.	3.7 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- parameterizable	Yes
<b>for technological functions</b>	
- parameterizable	No
<b>Digital outputs</b>	
Number of digital outputs	1
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	Max. -1.5 V
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	8 A
• on lamp load, max.	100 W
<b>Load resistance range</b>	
• lower limit	3 Ω
• upper limit	2 000 Ω

### Technical specifications

Article number	<b>6ES7136-6PA00-0BC0</b> ET 200SP, Powermod. F-PM-E PPM, 24V DC
<b>Output voltage</b> • for signal "1", min.	24 V; L+ (-0.5 V)
<b>Output current</b> • for signal "1" rated value • for signal "0" residual current, max.	8 A 1.5 mA; PP-switching: max. 1.5 mA; PM-switching: max. 1 mA
<b>Switching frequency</b> • with resistive load, max. • with inductive load, max.  • on lamp load, max.	10 Hz; Symmetrical 0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical 4 Hz; Symmetrical
<b>Total current of the outputs</b> • Current per channel, max. • Current per module, max.	8 A; note derating data in the manual 8 A; note derating data in the manual
<b>Cable length</b> • shielded, max. • unshielded, max.	1 000 m 500 m
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes; See Chapter "Alarms/diagnostic messages" in the manual
Substitute values connectable	No
<b>Alarms</b> • Diagnostic alarm • Hardware interrupt	Yes No
<b>Diagnostics indication LED</b> • RUN LED • ERROR LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics	Yes; green LED Yes; red LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED

Article number	<b>6ES7136-6PA00-0BC0</b> ET 200SP, Powermod. F-PM-E PPM, 24V DC
<b>Potential separation</b> <b>Potential separation channels</b> • between the channels and back- plane bus	Yes
<b>Standards, approvals, certificates</b> Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b> • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508	PLe SIL 3
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> - Low demand mode: PFDavg in accordance with SIL2 - Low demand mode: PFDavg in accordance with SIL3 - High demand/continuous mode: PFH in accordance with SIL2 - High demand/continuous mode: PFH in accordance with SIL3	< 2.00E-04 < 2.00E-05 < 1.00E-08 1/h < 1.00E-09 1/h
<b>Ambient conditions</b> <b>Ambient temperature during operation</b> • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max.	0 °C 60 °C 0 °C 50 °C
<b>Dimensions</b> Width Height Depth	20 mm 73 mm 55 mm
<b>Weights</b> Weight, approx.	70 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Fail-safe I/O modules > Fail-safe technology modules

#### Overview



Fail-safe technology module:  
F-TM Count, 1x1Vpp sin/cos High Feature for BU type A0,  
color code CC00

Important features:

- Technological, fail-safe counter module for ET 200SP
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- 1x sin/cos interface for recording sin/cos differential encoder signals A, A/, B, B/, N and N/
- Option to connect sin/cos differential encoders
- Short-circuit-proof 5 V DC encoder supply
- High-speed count input up to 200 kHz
- Counting range: 32-bit (-2.147.483.648 to +2.147.483.647)
- SW gate for counter control

- Measured values:
  - Speed
  - Frequency
  - Period duration
- Integrated safety functions:
  - SOS (Safe Operation Stop)
  - SLS (Safely Limited Speed)
  - SDI (Safe Direction)
- Can be plugged onto type A0 BaseUnits (BU)
- LED display for error, operation, supply voltage and status
- Monitoring of encoder signals for wire break, short-circuit and signal strength
- Firmware update
- Identification data I&M
- Value status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories:
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFI-safe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

#### Ordering data

##### Fail-safe technology module F-TM Count

1 x 1Vpp sin/cos High Feature,  
BU type A0, color code CC00

#### Article No.

**6ES7136-6CB00-0CA0**

##### Spare parts

##### E-coding element type H

5 units, for ET 200SP F-AI 4xU,  
F-TM Count, F-CM AS-i

**6ES7193-6EH00-1AA0**

##### Suitable BaseUnits

##### BU15-P16+A10+2D

BU type A0; BaseUnit (light)  
with 16 push-in terminals (1 ... 16)  
to the module and an additional  
10 internally jumpered  
AUX terminals (1 A to 10 A);  
for starting a new load group  
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0**

#### Article No.

##### BU15-P16+A0+2D

BU type A0; BaseUnit (light) with  
16 push-in terminals to the module;  
for starting a new load group  
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

##### 2BU15-P16+A0+2DB

Double BaseUnit for  
holding 2 I/O modules;  
BU type A0; BaseUnit (light/dark)  
with 16 push-in terminals to the  
module; for starting a new load  
group (max. 10 A)

- Pack of 1 unit

**6ES7193-6BP60-0DA0**

##### BU15-P16+A10+2B

BU type A0; BaseUnit (dark)  
with 16 push-in terminals (1 ... 16)  
to the module and an additional  
10 internally jumpered  
AUX terminals (1 A to 10 A);  
for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack,  
please order this article number  
with an order quantity of 10.

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0**

Ordering data	Article No.	Article No.
<p><b>BU15-P16+A0+2B</b></p> <p>BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group</p> <ul style="list-style-type: none"> <li>• Pack of 1 unit</li> <li>• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.</li> </ul>	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>	<p><b>STEP 7 Safety Advanced V17</b></p> <p><u>Task:</u> Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco</p> <p><u>Requirement:</u> STEP 7 Professional V17</p> <p><u>Note:</u> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.</p> <p>Floating license for 1 user; license key on USB flash drive <b>6ES7833-1FA17-0YA5</b></p> <p>Floating license for 1 user; license key for download<sup>1)</sup>; Email address required for delivery <b>6ES7833-1FA17-0YH5</b></p> <p><b>Equipment labeling plate</b> <b>6ES7193-6LF30-0AW0</b> 10 sheets of 16 labels</p> <p><b>Labeling strips</b></p> <p>500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer <b>6ES7193-6LR10-0AA0</b></p> <p>500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer <b>6ES7193-6LR10-0AG0</b></p> <p>1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer <b>6ES7193-6LA10-0AA0</b></p> <p>1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer <b>6ES7193-6LA10-0AG0</b></p> <p><b>BU cover</b></p> <p>For covering empty slots (gaps); 5 units</p> <ul style="list-style-type: none"> <li>• 15 mm wide <b>6ES7133-6CV15-1AM0</b></li> <li>• 20 mm wide <b>6ES7133-6CV20-1AM0</b></li> </ul> <p><b>Shield connection</b> <b>6ES7193-6SC00-1AM0</b> 5 shield supports and 5 shield terminals</p> <p><b>Color-coded labels</b></p> <ul style="list-style-type: none"> <li>• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units <b>6ES7193-6CP01-2MA0</b></li> <li>• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units <b>6ES7193-6CP01-4MA0</b></li> <li>• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units <b>6ES7193-6CP71-2AA0</b></li> <li>• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units <b>6ES7193-6CP72-2AA0</b></li> <li>• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units <b>6ES7193-6CP73-2AA0</b></li> </ul>
<p><b>2BU15-P16+A0+2B</b></p> <p>Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group</p> <ul style="list-style-type: none"> <li>• Pack of 1 unit</li> </ul>	<b>6ES7193-6BP60-0BA0</b>	
<p><b>Accessories</b></p> <p><b>S7 Distributed Safety V5.4 SP5 Update 2 programming tool</b></p> <p><u>Task:</u> Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP</p> <p><u>Requirement:</u> Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version</p> <p>Floating license for 1 user; software and documentation on DVD; license key on USB flash drive <b>6ES7833-1FC02-0YA5</b></p> <p>Floating license for 1 user; software, documentation and license key for download<sup>1)</sup>; Email address required for delivery <b>6ES7833-1FC02-0YH5</b></p>		
<p><b>S7 Distributed Safety upgrade</b></p> <p>From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive <b>6ES7833-1FC02-0YE5</b></p>		

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Fail-safe I/O modules > Fail-safe technology modules

#### Technical specifications

Article number	<b>6ES7136-6CB00-0CA0</b> F-TM Count 1x1Vpp sin/cos HF
<b>General information</b>	
Product type designation	F-TM Count 1x1Vpp sin/cos HF
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	Step 7 V17 or higher: use GSDML for prior versions
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes; 5.1 V ±3.5 %
• Short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	300 mA
<b>Digital inputs</b>	
Number of digital inputs	1; (counter input)
Digital inputs, parameterizable	Yes
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes
• Counter for incremental encoder - Number, max.	Yes 1
<b>Input voltage</b>	
• Type of input voltage	sin/cos 1 Vpp
<b>Input delay (for rated value of input voltage)</b>	
• Minimum pulse width for program reactions	2.5 µs for parameterization "none"
<b>for technological functions</b>	
- parameterizable	Yes
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes; up to 200 kHz depending on cable type and length
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Input voltage	1 Vpp, centered at 2.5 V offset
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	150 m
• Incremental encoder with A/B tracks, 90° phase offset	Yes; sin/cos
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes; sin/cos/zero

Article number	<b>6ES7136-6CB00-0CA0</b> F-TM Count 1x1Vpp sin/cos HF
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes; see chapter "Diagnostic Messages" in the manual
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Integrated Functions</b>	
Counter	
• Number of counters	1
• Counting frequency, max.	800 kHz; with quadruple evaluation
<b>Safety monitoring functions</b>	
• Safe Operating Stop (SOS)	Yes
• Safely-Limited Speed (SLS)	Yes
• Safe Direction (SDI)	Yes
• Safe Speed Monitor (SSM)	Yes
<b>Counting functions</b>	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Software gate	Yes
• Counting range, parameterizable	Yes
<b>Measuring functions</b>	
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz; with quadruple evaluation
- Cycle duration measurement, min.	1 µs
- Cycle duration measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
- Cycle duration measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
- Velocity measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)



#### Technical specifications

Article number	<b>6ES7136-6CB00-0CA0</b> F-TM Count 1x1Vpp sin/cos HF
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	Cat. 4, PLe
• SIL acc. to IEC 61508	SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	55 °C

Article number	<b>6ES7136-6CB00-0CA0</b> F-TM Count 1x1Vpp sin/cos HF
<b>Altitude during operation relating to sea level</b>	
• Ambient air temperature-barometric pressure-altitude	On request: Installation altitudes greater than 2 000 m
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	42 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-input modules

### Overview



Digital fail-safe input module:  
F-DI 8x24 V DC High Feature for BU type A0, color code CC01

Important features:

- 8-channel digital fail-safe input module for the ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Ordering data

### Article No.

#### SIPLUS digital F-input modules

(Extended temperature range and exposure to environmental substances)

F-DI 8x24VDC High Feature, BU type A0, color code CC01

**6AG1136-6BA00-2CA0**

#### Usable BaseUnits

##### BU15-P16+A0+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**6AG1193-6BP00-7DA0**

##### BU15-P16+A0+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**6AG1193-6BP00-7BA0**

##### BU15-P16+A10+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

**6AG1193-6BP20-7DA0**

##### BU15-P16+A10+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

**6AG1193-6BP20-7BA0**

#### Accessories

##### SIPLUS Mounting Kit ET 200SP

Mounting accessories for use with increased mechanical vibration and shock loads.

**6AG1193-6AA00-0AA0**

#### Other accessories

See SIMATIC ET 200SP, digital F-input modules, page 10/177

## Technical specifications

Article number	<b>6AG1136-6BA00-2CA0</b>
Based on	<b>6ES7136-6BA00-0CA0</b> SIPLUS ET 200SP F-DI 4/8x24VDC HF
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	4 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	<b>6AG1136-6BA00-2CA0</b>
Based on	<b>6ES7136-6BA00-0CA0</b> SIPLUS ET 200SP F-DI 4/8x24VDC HF
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

**Fail-safe I/O modules > SIPLUS digital F-output modules****Overview**

Digital fail-safe output module:  
F-DQ 4x24VDC High Feature, BU type A0, color code CC01

Important features:

- 4-channel digital fail-safe output module for the ET 200SP
- Fail-safe 2-channel activation (switching to P/M potential) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations
- They can be used with all fail-safe SIMATIC S7 CPUs

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS digital F-output modules**

(Extended temperature range and exposure to environmental substances)

F-DQ 4x24VDC High Feature, BU type A0, color code CC01

**6AG1136-6DB00-2CA0**

F-DQ 8x24VDC High Feature, switching to PP potential, BU type A0, color code CC01

**6AG1136-6DC00-2CA0****Usable BaseUnits****BU15-P16+A0+2D**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**6AG1193-6BP00-7DA0****BU15-P16+A0+2B**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**6AG1193-6BP00-7BA0****BU15-P16+A10+2D**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

**6AG1193-6BP20-7DA0****BU15-P16+A10+2B**

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

**6AG1193-6BP20-7BA0****BU20-P12+A4+0B**

(Extended temperature range and exposure to environmental substances)

BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group; 1 unit

**6AG1193-6BP20-7BB0****Accessories****SIPLUS Mounting Kit ET 200SP**

Mounting accessories for use with increased mechanical vibration and shock loads.

**6AG1193-6AA00-0AA0****Other accessories**

See SIMATIC ET 200SP, digital F-output modules, page 10/180

#### Technical specifications

Article number	<b>6AG1136-6DB00-2CA0</b>	<b>6AG1136-6DC00-2CA0</b>
Based on	<b>6ES7136-6DB00-0CA0</b> SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	<b>6ES7136-6DC00-0CA0</b> SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	4 000 m	4 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992
<b>Relative humidity</b>		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>		
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**Fail-safe I/O modules > SIPLUS digital F-output modules****Technical specifications**

Article number	<b>6AG1136-6DB00-2CA0</b>	<b>6AG1136-6DC00-2CA0</b>
Based on	<b>6ES7136-6DB00-0CA0</b> SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	<b>6ES7136-6DC00-0CA0</b> SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**Overview**

The digital F-electronic module relay 1 F-RQ DC 24VDC/24.230VAC/5 A has the following characteristics:

- 1 relay output (2 NO contacts)
- Total output current 5 A
- Rated load voltage 24 V DC and 24 ... 230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals.

The attainable safety integrity level is SIL 3 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS Digital F-output module relay 1 F-RQ**

(Extended temperature range and exposure to environmental substances)

BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24 ... 230 V AC; can be used up to SIL3/Category 4/PL e if controlled via F-DQ

**6AG1136-6RA00-2BF0****Suitable BaseUnits****BU20-P8+A4+0B**

(Extended temperature range and exposure to environmental substances)

BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group

**6AG1193-6BP20-2BF0****Accessories**

See SIMATIC ET 200SP, digital F-output module relay, page 10/183

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Fail-safe I/O modules > SIPLUS digital F-output module relay

#### Technical specifications

Article number	<b>6AG1136-6RA00-2BF0</b>
Based on	<b>6ES7136-6RA00-0BF0</b> SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *

Article number	<b>6AG1136-6RA00-2BF0</b>
Based on	<b>6ES7136-6RA00-0BF0</b> SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A



## Overview



Analog fail-safe input module:  
SIPLUS F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature  
for BU type A0 and A1, color code CC00

Important features:

- 4 analog inputs with galvanic isolation between channels and backplane bus (up to SIL 3/Cat. 4/PL d)
- Short-circuit-proof power supply of 2 or 4-wire transducers
- Measuring ranges: 0 ... 20 mA and 4 ... 20 mA
- Resolution: 16 bits including sign

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged onto type A0 and A1 BaseUnits (BU)
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

## Article No.

## SIPLUS analog F-input module

(Extended temperature range and exposure to environmental substances)

F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature, BU type A0, A1, color code CC00

6AG1136-6AA00-2CA1

## Usable BaseUnits

## BU15-P16+A10+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

## BU15-P16+A0+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

## BU15-P16+A10+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

## Article No.

## BU15-P16+A0+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

## BU15-P16+A0+12D/T

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and also 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)

6AG1193-6BP40-7DA1

## BU15-P16+A0+2D/T

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA1

## BU15-P16+A0+12B/T

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and also 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group

6AG1193-6BP40-7BA1

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Fail-safe I/O modules > SIPLUS analog F-input modules

Ordering data	Article No.	Accessories	Article No.
<b>BU15-P16+A0+2B/T</b> (Extended temperature range and exposure to environmental substances)  BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA1</b>	<b>SIPLUS Mounting Kit ET 200SP</b> Mounting accessories for use with increased mechanical vibration and shock loads.	<b>6AG1193-6AA00-0AA0</b>
		<b>Other accessories</b> See SIMATIC ET 200SP, analog F-input modules, page 10/186	

### Technical specifications

Article number	<b>6AG1136-6AA00-2CA1</b>
Based on	<b>6ES7136-6AA00-0CA1</b> SIPLUS ET 200SP F-AI 4xI 2-/4-wire HF
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	4 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	<b>6AG1136-6AA00-2CA1</b>
Based on	<b>6ES7136-6AA00-0CA1</b> SIPLUS ET 200SP F-AI 4xI 2-/4-wire HF
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview



Digital fail-safe power module:  
F-PM-E PPM 24 V DC/8 A for BU type C0,  
color code CC52

## Important features:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (switching to PPM potential, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply switching to PP or PM potential can be configured

- Configurable onboard evaluation of the fail-safe inputs for control of the fail-safe digital output and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations.
- They can be used with all fail-safe SIMATIC S7 CPUs.

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

**SIPLUS digital F-power module  
F-PM-E 24VDC/8A PPM Standard**

(Extended temperature range  
and exposure to environmental  
substances)

BU type C0, color code CC52. 2  
inputs, 1 output, SIL3/Cat.4/PL e

**Type C0 BaseUnits****BU20-P6+A2+4D**

(Extended temperature range  
and exposure to environmental  
substances)

BU type C0; BaseUnit (light)  
with 6 push-in terminals (1...6) to  
the module and 2 AUX terminals;  
new load group

## Article No.

6AG1136-6PA00-2BC0

6AG1193-6BP20-7DC0

## Article No.

**Accessories****SIPLUS Mounting Kit ET 200SP**

Mounting accessories for use with  
increased mechanical vibration and  
shock loads.

**Other accessories**

6AG1193-6AA00-0AA0

See SIMATIC ET 200SP,  
special fail-safe modules,  
page 10/190

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Fail-safe I/O modules > SIPLUS special fail-safe modules

#### Technical specifications

Article number	<b>6AG1136-6PA00-2BC0</b>
Based on	<b>6ES7136-6PA00-0BC0</b> SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	4 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	<b>6AG1136-6PA00-2BC0</b>
Based on	<b>6ES7136-6PA00-0BC0</b> SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview



F-CM AS-i Safety ST for SIMATIC ET 200SP

## More information

SIMATIC ET200SP Manual Collection,  
see <https://support.industry.siemens.com/cs/ww/en/view/84133942>

Diagnostic blocks with visualization,  
see <https://support.industry.siemens.com/cs/ww/en/view/109479103>

Released combinations of the AS-i modules for ET 200SP,  
see <https://support.industry.siemens.com/cs/ww/en/view/103624653>

The F-CM AS-i Safety ST fail-safe communications module supplements an AS-Interface network without additional wiring to produce a safety-related AS-i network.

Important features:

- Fail-safe communications module for the ET 200SP
  - 31 fail-safe input channels in the process image
  - 16 fail-safe output channels in the process image
  - Certified up to SIL 3 (IEC 62061), PL e (EN ISO 13849-1)
  - Parameterization conforms with other Failsafe I/O modules of the ET 200SP
- The communications module supports PROFINET and PROFIBUS configurations. It can be used with fail-safe SIMATIC S7-300F/S7-400F CPUs and S7-1500F CPUs and also the Failsafe versions of the ET 200SP station with ET 200SP F-CPU 1510SP F / 1512SP F or 1515SP PC F.
- For reading up to 31 fail-safe AS-i input slaves
  - Two sensor inputs/signals for each fail-safe AS-i input slave
  - Adjustable evaluation of sensor signals: two-channel or 2 x single-channel
  - Integrated discrepancy evaluation in the case of two-channel signals
  - Integrated AND operation in the case of 2 x single-channel signals
  - Input delay can be parameterized
  - Start-up test can be set
  - Sequence monitoring can be activated

- For control of up to 16 fail-safe AS-i output circuit groups
  - The output circuit groups are controlled independently of one another
  - One output circuit group can act on one or more actuators (e.g. to switch drives simultaneously)
  - An actuator (e.g. a contactor) is interfaced via an AS-i safety output module (e.g. SlimLine S45F safety module, Article No. 3RK1405-1SE15-0AA2; see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10011823?tree=CatalogTree>).
  - Simple fault acknowledgment via the process image
- Simple module replacement thanks to automatic importing of the safety parameters from the coding element
- Comprehensive diagnostics options
- Can be plugged onto type C1 or type C0 BaseUnits (BU)
- Informative automatic alarm indications
- Supply via AS-Interface voltage
- Eight LED indicators for diagnostics, operating state, fault indication and supply voltage
- Informative front-side module inscription
  - Plain-text marking of the module type and function class
  - 2D matrix code (Article No. and serial number)
  - Connection diagram
  - Color coding module type communications module: light gray
  - Hardware and firmware version
  - Supported BaseUnit type BU: C1, C0

## Design

The fail-safe F-CM AS-i Safety ST module has an ET 200SP module enclosure with a width of 20 mm.

One AS-i master according to the AS-i Specification V3.0, as well as fail-safe AS-i input slaves and/or AS-i safety output modules are needed for operation. The CM AS-i master ST communications module (Article No. 3RK7137-6SA00-0BC1) is recommended as the AS-i master for the ET 200SP, see from page 10/149.

Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-oriented network transition between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion.



Combination of an ET 200SP interface module, CM AS-i Master ST and F-CM AS-i Safety ST

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

Fail-safe modules > Fail-safe communication > F-CM AS-i Safety ST for SIMATIC ET 200SP

### Overview

With the digital and analog I/O modules of the ET 200SP, additional local inputs and outputs can be realized so as to ensure that the modular AS-i router complies precisely with customer requirements. Expansion variants for almost every application are possible thanks to the selection of standard and Failsafe I/O modules.

Besides the single AS-i master, double, triple or generally multiple masters can also be realized with or without fail-safe functionality.

#### Supported BaseUnits

With the combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules, the CM module is plugged onto a light type C0 BaseUnit and, directly to the right of it, the F-CM module is plugged onto a dark type C1 BaseUnit. The AS-i cable is connected only on the light BaseUnit of the CM module.

#### Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions represent only one component of such a concept.

For more information on Industrial Security, see <http://www.siemens.com/industrialsecurity>.

#### Configuration

The following software is required for configuration of the F-CM AS-i Safety ST module:

- STEP 7 (TIA Portal) and Safety Advanced
- or
- STEP 7 (Classic) and Distributed Safety or F-Configuration Pack or SIMATIC S7 F/FH systems

Configuration and programming are done entirely in the STEP 7 user interface. No additional configuration software is needed for commissioning.

Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

The input and output channels are assigned to the process image automatically and manual linking via configuration function blocks is not necessary.

If the F-CM AS-i Safety ST module is replaced, all necessary settings are automatically imported into the new module.

The F-CM AS-i Safety ST module occupies 16 input bytes and 8 output bytes in the I/O data of the ET 200SP station.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>.



Diagnostic block for F-CM AS-i Safety ST

### Application

Thanks to use of the fail-safe module in the ET 200SP, it is possible to fulfill the safety-related application requirements in a manner that is integrated in the overall automation solution.

The safety functions required for fail-safe operation are integrated in the modules. Communication with the fail-safe SIMATIC S7 CPUs is realized via PROFIsafe.

The safety application is programmed in the SIMATIC S7 F-CPU with Distributed Safety / S7 F/FH Systems / Safety Advanced. The fail-safe input signals of the ASIsafe slave modules are read via the AS-i bus line and are combined with any chosen further signals in the fail-safe program.

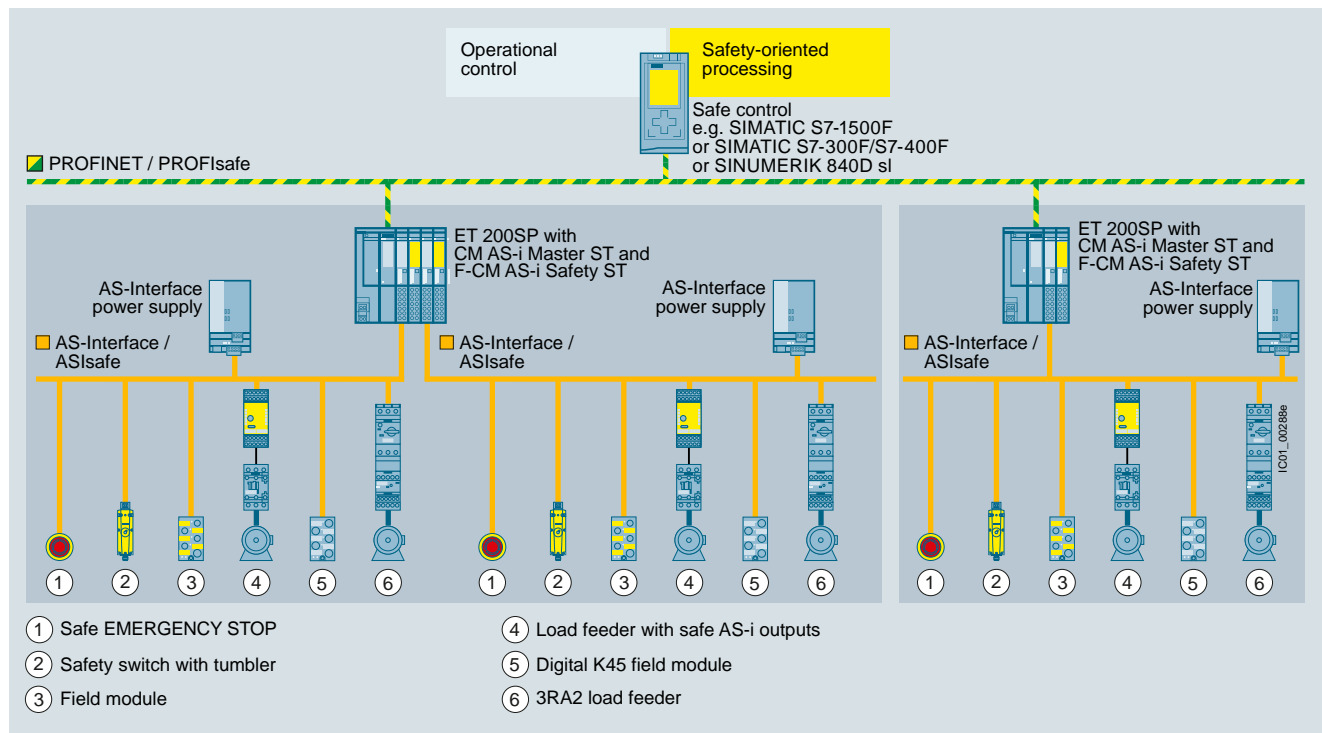
The fail-safe output signals can be output via safe SIMATIC output modules or also directly via AS-i – with the help of safe AS-i output modules, e.g. SlimLine S45F safety modules, article number 3RK1405-1SE15-0AA2 (see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10011823?tree=CatalogTree>). No special functions are required for this in the program.

Operation with SINUMERIK 840D sl is possible with SINUMERIK software version V4.7 SP2 HF1 or higher.

Together with an ET 200SP station with ET 200SP F-CPU 1510SP F / 1512SP F or 1515SP PC F, pre-processing of safe AS-i signals directly in the ET 200SP station is possible, as well as the configuration of an autonomous AS-i Safety station without a higher-level CPU.

**Application**

**Configuration examples of AS-Interface networks with CM AS-i Master ST and F-CM AS-i Safety ST for SIMATIC ET 200SP**



AS-Interface configuration comprising an ET 200SP station with CM AS-i Master ST and F-CM AS-i Safety ST modules

10

**Ordering data**

**Article No.**

**Article No.**

**F-CM AS-i Safety ST communications module**

**3RK7136-6SC00-0BC1**

- Failsafe module for SIMATIC ET 200SP, can be plugged onto BaseUnit type C1 (alternatively type C0)
- Operation requires an AS-i master, e.g. CM AS-i Master ST
- Can be used up to SIL 3 (IEC 62061), PL e (EN ISO 13849-1)
- Coding element type H (included in scope of supply)
- Dimensions (W x H x D / mm): 20 x 73 x 58

**Accessories**

**6ES7193-6BP20-0BC1**

- BaseUnit BU20-P6+A2+4B**
- BaseUnit (dark), BU type C1
  - Suitable for the F-CM AS-i Safety ST failsafe module
  - Continuation of an AS-i network, connection with the AS-i voltage of the left-hand module
  - Spring-loaded terminals

**Coding element type H (spare part)**

**6ES7193-6EH00-1AA0**

- For the ET 200SP modules F-CM AS-i Safety ST and CM 4xIO-Link
- Spring-loaded terminals
- Packing unit 5 items

**More accessories**

see CM AS-i Master ST communications modules, page 10/149

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Ex I/O modules

#### Overview

The intrinsically safe ET 200SP HA Ex I/O modules extend the SIMATIC ET 200SP HA and SIMATIC ET 200SP distributed I/O systems with the option of integrating devices located in hazardous areas (intrinsically safe sensors, actuators and HART field devices) into the system.

The ET 200SP HA Ex I/O modules with device protection according to intrinsic safety "i" offer channel outputs in Zone 0 or 1, 2-channel HART analog input and output modules and 2/4-channel digital input and output modules with different characteristic curves as well as a power module for intrinsically safe power supply of the modules.

Separate Ex isolators with correspondingly complex wiring and high space requirements are no longer required. The I/O modules can be installed up to ATEX Zone 2 and offer intrinsically safe circuits in Ex ia design for field devices up to Zone 0.

The Ex modules offer channel diagnostics and configuration in Run and are approved for ambient temperatures from -40 to +70 °C.

#### Ordering data

#### Article No.

Ordering data	Article No.
<b>Ex digital modules SIMATIC ET 200SP HA</b>	
<b>Digital Ex-i input module, Ex-DI 4xNAMUR</b> Suitable for BaseUnit Type X1, channel diagnostics	6DL1131-6TD00-0HX1
<b>Digital Ex-i output module Ex-DQ 2x23,1VDC/20 mA</b> Suitable for BaseUnit Type X1, channel diagnostics	6DL1132-6EB00-0HX1
<b>Digital Ex-i output module Ex-DQ 2x17,4VDC/27 mA</b> Suitable for BaseUnit Type X1, channel diagnostics	6DL1132-6CB00-0HX1
<b>Ex analog modules SIMATIC ET 200SP HA</b>	
<b>Analog Ex-i HART input module, Ex-AI 2xI 2-wire HART</b> Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.3%	6DL1134-6TB00-0HX1
<b>Analog Ex-i input module, Ex-AI 4xTC/2xRTD 2-/3-/4-wire</b> Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.05%	6DL1134-6JD00-0HX1
<b>Analog Ex-i HART output module, Ex-AQ 2xI HART HF</b> Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.3%	6DL1135-6TB00-0HX1
<b>Power module and BaseUnits</b>	
<b>Power module Ex-PM E</b> 24 V 0.8 A, W x H: 50 mm x 117 mm, suitable for BaseUnit Type W0	6DL1133-6PX00-0HW0
<b>BU Type X1 for I/O modules</b> Push-in terminals, W x H: 20 mm x 117 m	6DL1193-6BP00-0BX1
<b>BU Type W0 for Ex power module PM-E</b> W x H: 50 mm x 117 mm	6DL1193-6BP00-0DW0



### Technical specifications

Article number	<b>6DL1131-6TD00-0HX1</b> ET 200SP HA, EX-DI 4xNAMUR
<b>General information</b>	
Product type designation	Ex-DI 4xNAMUR
<b>Product function</b>	
• Isochronous mode	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	STEP 7 V5.6 SP2 or higher
• PCS 7 configurable/integrated from version	V9.1
<b>Operating mode</b>	
• DI	Yes
• Counter	Yes
• MSI	Yes
<b>Encoder supply</b>	
Number of outputs	4
Short-circuit protection	Yes
<b>Digital inputs</b>	
Number of digital inputs	4; NAMUR
Digital inputs, parameterizable	Yes
Pulse extension	Yes; 0.5 s, 1 s, 2 s
Time stamping	No
Edge evaluation	Yes; Positive edge, negative edge
Signal change flutter	Yes; 2 to 32 signal changes
Flutter observation window	Yes; 0.5 s, 1 s to 100 s in 1-s steps
<b>Input voltage</b>	
• Rated value (DC)	8.2 V
<b>Input current</b>	
<b>for 10 k switched contact</b>	
- for signal *0*	Max. 1.2 mA
- for signal *1*	Min. 2.1 mA
<b>for unswitched contact</b>	
- for signal *0*, max. (permissible quiescent current)	0.5 mA
- for signal *1*	typ. 8 mA
<b>for NAMUR encoders</b>	
- for signal *0*	0.35 to 1.2 mA
- for signal *1*	2.1 ... 6.4 mA
<b>Encoder</b>	
<b>Connectable encoders</b>	
• NAMUR encoder/changeover contact according to EN 60947	Yes
• Single contact / changeover contact unconnected	Yes
• Single contact / changeover contact connected with 10 kΩ	Yes

Article number	<b>6DL1131-6TD00-0HX1</b> ET 200SP HA, EX-DI 4xNAMUR
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Hardware interrupt	Yes; channel by channel
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Monitoring of encoder power supply	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
• Group error	Yes
<b>Diagnostics indication LED</b>	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
<b>Accuracy</b>	
- Frequency measurement	1 %
<b>Ex(i) characteristics</b>	
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>0</sub> (no-load voltage), max.	9.6 V
• I <sub>0</sub> (short-circuit current), max.	61 mA; applies for up to four circuits connected in parallel
• P <sub>0</sub> (power output), max.	145 mW; applies for up to four circuits connected in parallel
• C <sub>0</sub> (permissible external capacity), max.	3.6 μF; applies for up to four circuits connected in parallel
• L <sub>0</sub> (permissible external inductivity), max.	13 mH; applies for up to four circuits connected in parallel
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	60 V
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	55 g

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Ex I/O modules****Technical specifications**

Article number	<b>6DL1132-6EB00-0HX1</b> ET 200SP HA, EX-DQ 2x23, 1VDC/20MA	<b>6DL1132-6CB00-0HX1</b> ET 200SP HA, EX-DQ 2x17, 4VDC/27MA
<b>General information</b>		
<b>Product function</b>		
• Isochronous mode	No	No
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	STEP 7 V5.6 SP2 or higher	STEP 7 V5.6 SP2 or higher
• PCS 7 configurable/integrated from version	V9.1	V9.1
<b>Operating mode</b>		
• DQ	Yes	Yes
• MSO	Yes	Yes
<b>Digital outputs</b>		
Number of digital outputs	2	2
Current-sinking	No	No
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes; capacitive loads can cause wire-break diagnostics when the channel is switched off	Yes; capacitive loads can cause wire-break diagnostics when the channel is switched off
Overload protection	Yes	Yes
Limitation of inductive shutdown voltage to	DQ.n- (-1 V)	DQ.n- (-1 V)
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	20 mA; See output characteristic in manual	27 mA; See output characteristic in manual
• with inductive load, max.	20 mA; See output characteristic in manual	27 mA; See output characteristic in manual
<b>Load resistance range</b>		
• lower limit	872 Ω; See output characteristic in manual	480 Ω; parallel operation 240 ohm, see output characteristic in manual
• upper limit	10 kΩ; See output characteristic in manual	10 kΩ; parallel operation 5 kOhm, see output characteristic in manual
<b>Output current</b>		
• for signal "1" rated value	20 mA	27 mA
• for signal "0" residual current, max.	100 µA; 250 µA test current for wire break diagnostics	100 µA; 250 µA test current for wire break diagnostics, parallel operation 500 µA
<b>Output delay with resistive load</b>		
• "0" to "1", typ.	50 µs	50 µs
• "1" to "0", typ.	100 µs	100 µs
<b>Parallel switching of two outputs</b>		
• for uprating	No	Yes
<b>Switching frequency</b>		
• with resistive load, max.	500 Hz	500 Hz
• with inductive load, max.	500 Hz	500 Hz
<b>Total current of the outputs</b>		
• Current per channel, max.	20 mA	27 mA
• Current per module, max.	40 mA	54 mA
<b>Total current of the outputs (per module)</b>		
<b>horizontal installation</b>		
- up to 70 °C, max.	40 mA	54 mA
<b>vertical installation</b>		
- up to 60 °C, max.	40 mA	54 mA
<b>Cable length</b>		
• shielded, max.	500 m; Ex characteristic values must be observed	500 m; Ex characteristic values must be observed
• unshielded, max.	500 m; Ex characteristic values must be observed	500 m; Ex characteristic values must be observed
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes

#### Technical specifications

Article number	<b>6DL1132-6EB00-0HX1</b> ET 200SP HA, EX-DQ 2x23, 1VDC/20MA	<b>6DL1132-6CB00-0HX1</b> ET 200SP HA, EX-DQ 2x17, 4VDC/27MA
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
• Maintenance interrupt	Yes	Yes
<b>Diagnoses</b>		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- parameterizable	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes
<b>Diagnostics indication LED</b>		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Ex(i) characteristics</b>		
<b>maximum values for connecting terminals for gas group IIC</b>		
• U <sub>o</sub> (no-load voltage), max.	24.8 V	19.4 V
• I <sub>o</sub> (short-circuit current), max.	99 mA	133 mA; parallel operation 266 mA
• P <sub>o</sub> (power output), max.	614 mW	645 mW; parallel operation 1 290 mW
• C <sub>o</sub> (permissible external capacity), max.	100 nF	232 nF; parallel operation 220 nF
• L <sub>o</sub> (permissible external inductivity), max.	3.5 mH	1.9 mH; parallel operation 328 uH
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	60 V	60 V
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
<b>Dimensions</b>		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
<b>Weights</b>		
Weight, approx.	55 g	55 g

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Ex I/O modules****Technical specifications**

Article number	<b>6DL1134-6TB00-0HX1</b> ET 200SP HA, EX-AI 2xI 2-WIRE HART	<b>6DL1134-6JD00-0HX1</b> ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
<b>General information</b>		
Product type designation	Ex-AI 2xI 2-wire HART	Ex-AI 4xTC/2xRTD 2-/3-/4-wire
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	STEP 7 V5.6 SP2 or higher	STEP 7 V5.6 SP2 or higher
• PCS 7 configurable/integrated from version	V9.1	V9.1
<b>Operating mode</b>		
• MSI	Yes	Yes
<b>Analog inputs</b>		
Number of analog inputs	2; Differential inputs	
• For current measurement	2	
• For voltage measurement		4
• For resistance/resistance thermometer measurement		2
• For thermocouple measurement		4
Constant measurement current for resistance-type transmitter, typ.		0.5 mA
Cycle time (all channels), min.	3 ms	
Technical unit for temperature measurement adjustable		Yes; °C/°F/K
<b>Input ranges (rated values), voltages</b>		
• -1 V to +1 V		Yes; 16 bit incl. sign
• -250 mV to +250 mV		Yes; 16 bit incl. sign
• -50 mV to +50 mV		Yes; 16 bit incl. sign
• -80 mV to +80 mV		Yes; 16 bit incl. sign
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes; 15 bit + sign	
<b>Input ranges (rated values), thermocouples</b>		
• Type B		Yes; 16 bit incl. sign
• Type C		Yes; 16 bit incl. sign
• Type E		Yes; 16 bit incl. sign
• Type J		Yes; 16 bit incl. sign
• Type K		Yes; 16 bit incl. sign
• Type L		Yes; 16 bit incl. sign
• Type N		Yes; 16 bit incl. sign
• Type R		Yes; 16 bit incl. sign
• Type S		Yes; 16 bit incl. sign
• Type T		Yes; 16 bit incl. sign
• Type U		Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST		Yes; 16 bit incl. sign
<b>Input ranges (rated values), resistance thermometer</b>		
• Cu 10		Yes; 16 bit incl. sign
• Ni 100		Yes; 16 bit incl. sign
• LG-Ni 1000		Yes; 16 bit incl. sign
• Ni 120		Yes; 16 bit incl. sign
• Ni 200		Yes; 16 bit incl. sign
• Ni 500		Yes; 16 bit incl. sign
• Pt 100		Yes; 16 bit incl. sign
• Pt 1000		Yes; 16 bit incl. sign
• Pt 200		Yes; 16 bit incl. sign
• Pt 500		Yes; 16 bit incl. sign

#### Technical specifications

Article number	<b>6DL1134-6TB00-0HX1</b> ET 200SP HA, EX-AI 2xI 2-WIRE HART	<b>6DL1134-6JD00-0HX1</b> ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
<b>Input ranges (rated values), resistors</b>		
<ul style="list-style-type: none"> <li>• 0 to 150 ohms</li> <li>• 0 to 300 ohms</li> <li>• 0 to 600 ohms</li> <li>• 0 to 3000 ohms</li> <li>• 0 to 6000 ohms</li> <li>• PTC</li> </ul>		<ul style="list-style-type: none"> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> </ul>
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b> - parameterizable		Yes
<b>Cable length</b>		
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	500 m; Ex characteristic values must be observed	200 m; Ex characteristic values must be observed; line resistance at RTD (simple) max. 25 ohm; loop resistance at TC max. 8 kOhm
<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	300 m; Ex characteristic values must be observed	
<b>Analog value generation for the inputs</b>		
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)
<b>Integration and conversion time/resolution per channel</b>		
<ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> <li>• Integration time, parameterizable</li> </ul>	<ul style="list-style-type: none"> <li>16 bit</li> <li>Yes; channel by channel</li> </ul>	<ul style="list-style-type: none"> <li>16 bit</li> <li>Yes; Channel-by-channel, results from the selected interference frequency suppression</li> </ul>
<ul style="list-style-type: none"> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> <li>• Conversion time (per channel)</li> </ul>	<ul style="list-style-type: none"> <li>10 / 50 / 60 Hz</li> </ul>	<ul style="list-style-type: none"> <li>16.6 / 50 / 60 Hz, channel-by-channel</li> <li>180 / 60 / 50 ms, results from the selected interference frequency suppression</li> </ul>
<b>Smoothing of measured values</b>		
<ul style="list-style-type: none"> <li>• Number of smoothing levels</li> <li>• parameterizable</li> </ul>	<ul style="list-style-type: none"> <li>4; None; 4/8/16 times</li> <li>Yes</li> </ul>	<ul style="list-style-type: none"> <li>Yes; none, weak, medium, strong, channel-by-channel</li> </ul>
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
<ul style="list-style-type: none"> <li>• for current measurement as 2-wire transducer</li> <li>- Burden of 2-wire transmitter, max.</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>750 Ω; At 20 mA input current</li> </ul>	
<b>Errors/accuracies</b>		
<b>Basic error limit (operational limit at 25 °C)</b>		
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> <li>• Resistance, relative to input range, (+/-)</li> </ul>	<ul style="list-style-type: none"> <li>0.2 %</li> </ul>	<ul style="list-style-type: none"> <li>0.05 %</li> <li>0.05 %</li> </ul>
<b>Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency</b>		
<ul style="list-style-type: none"> <li>• Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>• Common mode voltage, max.</li> <li>• Common mode interference, min.</li> </ul>	<ul style="list-style-type: none"> <li>60 dB</li> </ul>	<ul style="list-style-type: none"> <li>70 dB</li> <li>60 V; Applicable for use in non-hazardous areas; no common mode voltage permissible in hazardous areas</li> <li>90 dB</li> </ul>
<b>Protocols</b>		
HART protocol	Yes	
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
<b>Alarms</b>		
<ul style="list-style-type: none"> <li>• Diagnostic alarm</li> <li>• Limit value alarm</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes; two upper and two lower limit values in each case</li> </ul>
<b>Diagnoses</b>		
<ul style="list-style-type: none"> <li>• Monitoring the supply voltage</li> <li>• Wire-break</li> <li>• Short-circuit</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes; channel by channel</li> <li>Yes; channel by channel</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes; channel by channel</li> </ul>

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### Ex I/O modules

#### Technical specifications

Article number	<b>6DL1134-6TB00-0HX1</b> ET 200SP HA, EX-AI 2xI 2-WIRE HART	<b>6DL1134-6JD00-0HX1</b> ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
<b>Diagnoses (continued)</b>		
• Group error	Yes	
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel
<b>Diagnostics indication LED</b>		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Ex(i) characteristics</b>		
<b>maximum values for connecting terminals for gas group IIC</b>		
• U <sub>o</sub> (no-load voltage), max.	26 V	5.9 V
• I <sub>o</sub> (short-circuit current), max.	93 mA	18 mA
• P <sub>o</sub> (power output), max.	605 mW	27 mW
• C <sub>o</sub> (permissible external capacity), max.	99 nF	43 µF
• L <sub>o</sub> (permissible external inductivity), max.	4 mH	110 mH
• U <sub>i</sub> (intrinsically safe input voltage), max.	10 V	
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
<b>Dimensions</b>		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
<b>Weights</b>		
Weight, approx.	55 g	55 g
Article number	<b>6DL1135-6TB00-0HX1</b> ET 200SP HA, EX-AQ 2xI HART	Article number <b>6DL1135-6TB00-0HX1</b> ET 200SP HA, EX-AQ 2xI HART
<b>General information</b>		
Product type designation	Ex-AQ 2xI HART	
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	
• Isochronous mode	No	
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP	
• STEP 7 configurable/integrated from version	STEP 7 V5.6 SP2 or higher	
• PCS 7 configurable/integrated from version	V9.1	
<b>Operating mode</b>		
• MSO	Yes	
<b>Analog outputs</b>		
Number of analog outputs	2	
Cycle time (all channels), min.	3 ms	
<b>Output ranges, current</b>		
• 0 to 20 mA		Yes; 15 bit
• 4 mA to 20 mA		Yes; 16 bit incl. sign
<b>Connection of actuators</b>		
• for current output two-wire connection		Yes
<b>Load impedance (in rated range of output)</b>		
• with current outputs, max.		500 Ω
• with current outputs, inductive load, max.		Ex characteristic values must be observed
<b>Cable length</b>		
• shielded, max.		500 m; Ex characteristic values must be observed
• unshielded, max.		300 m; Ex characteristic values must be observed
<b>Settling time</b>		
• for resistive load		1 ms; 500 ohms

#### Technical specifications

Article number	<b>6DL1135-6TB00-0HX1</b> ET 200SP HA, EX-AQ 2xI HART
<b>Errors/accuracies</b>	
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to output range, (+/-)	0.2 %
<b>Protocols</b>	
HART protocol	Yes
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes; Module-wise
• Wire-break	Yes; From output value > 240 µA
• Short-circuit	Yes; < 20 ohms as of 1 mA output value
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
<b>Diagnostics indication LED</b>	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED

Article number	<b>6DL1133-6PX00-0HW0</b> ET 200SP HA, Ex-PM E POWER MODULE
<b>General information</b>	
Product type designation	Ex-PM-E
<b>Product function</b>	
• I&M data	Yes; Asset data
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Output current</b>	
<b>horizontal installation</b>	
• up to 60 °C, max.	0.8 A
• up to 70 °C, max.	0.6 A
<b>vertical installation</b>	
• up to 50 °C, max.	0.8 A
• up to 60 °C, max.	0.6 A
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• missing load voltage	Yes

Article number	<b>6DL1135-6TB00-0HX1</b> ET 200SP HA, EX-AQ 2xI HART
<b>Ex(i) characteristics</b>	
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>o</sub> (no-load voltage), max.	22 V
• I <sub>o</sub> (short-circuit current), max.	91 mA
• P <sub>o</sub> (power output), max.	501 mW
• C <sub>o</sub> (permissible external capacity), max.	151 nF
• L <sub>o</sub> (permissible external inductivity), max.	4.1 mH
• U <sub>i</sub> (intrinsically safe input voltage), max.	10 V
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	60 V
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	55 g

Article number	<b>6DL1133-6PX00-0HW0</b> ET 200SP HA, Ex-PM E POWER MODULE
<b>Diagnostics indication LED</b>	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Ex(i) characteristics</b>	
Module for Ex(i) protection	Yes
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	60 V; power supply and backplane bus
<b>Potential separation</b>	
primary/secondary	Yes

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Ex I/O modules****Technical specifications**

Article number	<b>6DL1133-6PX00-0HW0</b> ET 200SP HA, Ex-PM E POWER MODULE	Article number	<b>6DL1133-6PX00-0HW0</b> ET 200SP HA, Ex-PM E POWER MODULE
<b>Ambient conditions</b>		<b>Dimensions</b>	
<b>Ambient temperature during operation</b>		Width	50 mm
• min.	-40 °C	Height	114 mm
• max.	70 °C; with derating	Depth	67.5 mm
<b>Altitude during operation relating to sea level</b>		<b>Weights</b>	
• Installation altitude above sea level, max.	2 000 m	Weight, approx.	182 g
Article number	<b>6DL1193-6BP00-0DW0</b> ET 200SP HA, Ex-BU TYPE W0	<b>6DL1193-6BP00-0BX1</b> ET 200SP HA, Ex-BU TYPE X1	
<b>General information</b>			
Product type designation	BU type W0	BU type X1	
<b>Product function</b>			
• I&M data	Yes; Asset data	Yes; Asset data	
<b>Hardware configuration</b>			
<b>Slots</b>			
• Number of slots	1	1	
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-40 °C	-40 °C	
• horizontal installation, max.	70 °C	70 °C	
• vertical installation, min.	-40 °C	-40 °C	
• vertical installation, max.	60 °C	60 °C	
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m	2 000 m	
<b>Connection method</b>			
<b>Terminals</b>			
• Terminal type		Push-in terminal	
• Conductor cross-section, min.		0.14 mm <sup>2</sup>	
• Conductor cross-section, max.		2.5 mm <sup>2</sup>	
• Number of process terminals to I/O module		8	
<b>Dimensions</b>			
Width	50 mm	20 mm	
Height	117 mm	117 mm	
Depth	19 mm	35 mm	
<b>Weights</b>			
Weight, approx.	38 g	42 g	



Overview



The new ET 200SP technology module F-TM StepDrive ST allows positioning and speed control of stepper motors up to 10 A peak current in very confined spaces.

Engineering in the TIA Portal stands for consistency in a single tool. This facilitates drive dimensioning, commissioning and servicing.

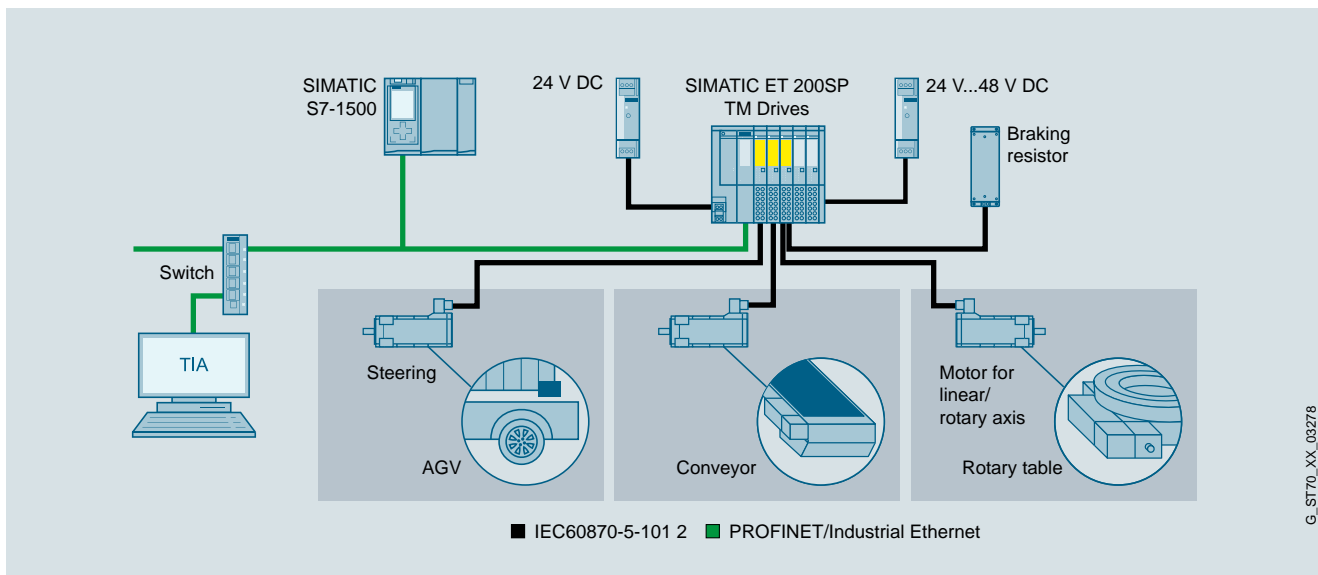
The new drive system consists of

- The F-TM StepDrive ST as a new member of the SIMATIC MICRO-DRIVE family
- The BaseUnit (U0)

Further information on the distributed I/O system SIMATIC ET 200SP is available on the Internet at <http://www.siemens.com/et200sp>

Characteristics

- PROFIdrive profile via PROFINET
- Hardware STO (SIL3)
- Digital input
- Encoderless operation
- Encoder connection for - Incremental encoders



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Application example TM drive controller

Variant	Power	Device width
Standard	280 W	20 mm

More information:

<https://www.siemens.com/micro-drive>

Ordering data

Article No.

F-TM StepDrive drive controller for SIMATIC MICRO-DRIVE

Variant

- Standard V1; 24 ... 48 V, 5 A with hardware STO

6BK1136-6SB00-0BU0

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > SIMATIC ET 200SP drive controllers > SIMATIC MICRO-DRIVE F-TM StepDrive ST

**Technical specifications**

Article number	<b>6BK1136-6SB00-0BU0</b> F-TM StepDrive 1x24..48V 5A ST
<b>General information</b>	
Product type designation	F-TM StepDrive 1x24 ... 48 V 5 A ST
Product description	control of stepper motors
<b>Product function</b>	
• I&M data	Yes
• Isochronous mode	No
• Four-quadrant operation	Yes
• Speed control with encoder	No
• Speed control without encoder	No
• Safety Functions	Yes; Drive controller with hardwired STO
<b>Protection function</b>	
• Undervoltage protection	Yes
• Overvoltage protection	Yes
• Overload protection	Yes
• Ground-fault protection	No
• Short-circuit protection	Yes
<b>Installation type/mounting</b>	
Type of ventilation	Convection cooling
<b>Supply voltage</b>	
Design of the power supply	24 ... 48 V DC, SELV / PELV
<b>Output voltage</b>	
Rated value, min.	24 V
Rated value, max.	48 V
<b>Output current</b>	
Current output (rated value)	5 A
Output current, max.	10 A
Output frequency	1 000 Hz
<b>Encoder supply</b>	
Number of outputs	1
<b>5 V encoder supply</b>	
• 5 V	Yes
• Short-circuit protection	Yes
• Output current, max.	150 mA
<b>Digital inputs</b>	
Number of digital inputs	1; input for message signal
Number of safety inputs	1; For STO, antivalent (2-pin) - 24 V DC
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes; up to 500 Hz per channel

Article number	<b>6BK1136-6SB00-0BU0</b> F-TM StepDrive 1x24..48V 5A ST
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes
• ERROR LED	Yes
<b>Integrated Functions</b>	
<b>Position detection</b>	
• Incremental acquisition	Yes
• Absolute acquisition	No
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
cULus	No
RCM (formerly C-TICK)	No
KC approval	No
EAC (formerly Gost-R)	No
China RoHS compliance	Yes
Standard for EMC according to EN 61800-3	Yes, according to second environment Category C2 acc. EN 61800-3
Standard for drive acc. to EN 61800-5-1	Yes
Standard for drive acc. to EN 61800-5-2	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	Category 3, performance level d, according to EN ISO 13849-1:2015
• SIL acc. to IEC 61508	SIL 3 according to DIN EN 61800-5-2:2017

### Technical specifications

Article number	<b>6BK1136-6SB00-0BU0</b> F-TM StepDrive 1x24..48V 5A ST
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• horizontal installation, max.	60 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
• vertical installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• vertical installation, max.	50 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	3 000 m

Article number	<b>6BK1136-6SB00-0BU0</b> F-TM StepDrive 1x24..48V 5A ST
<b>Cables</b>	
Cable length for motor, shielded, max.	10 m
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	55 g
<b>Other</b>	
Brake design	holding brake control via the process image
Braking chopper	No

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules > SIMATIC ET 200SP drive controllers > SIMATIC MICRO-DRIVE F-TM ServoDrive ST

### Overview



SIMATIC MICRO-DRIVE F-TM ServoDrive ST Video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6136813197001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6136813197001)



In combination with EC motors, the new ET 200SP technology module F-TM ServoDrive ST allows positioning and speed control of EC motors up to 280 W in very confined spaces.

Engineering in the TIA Portal stands for consistency in a single tool. This facilitates drive dimensioning, commissioning and servicing.

The new drive system consists of

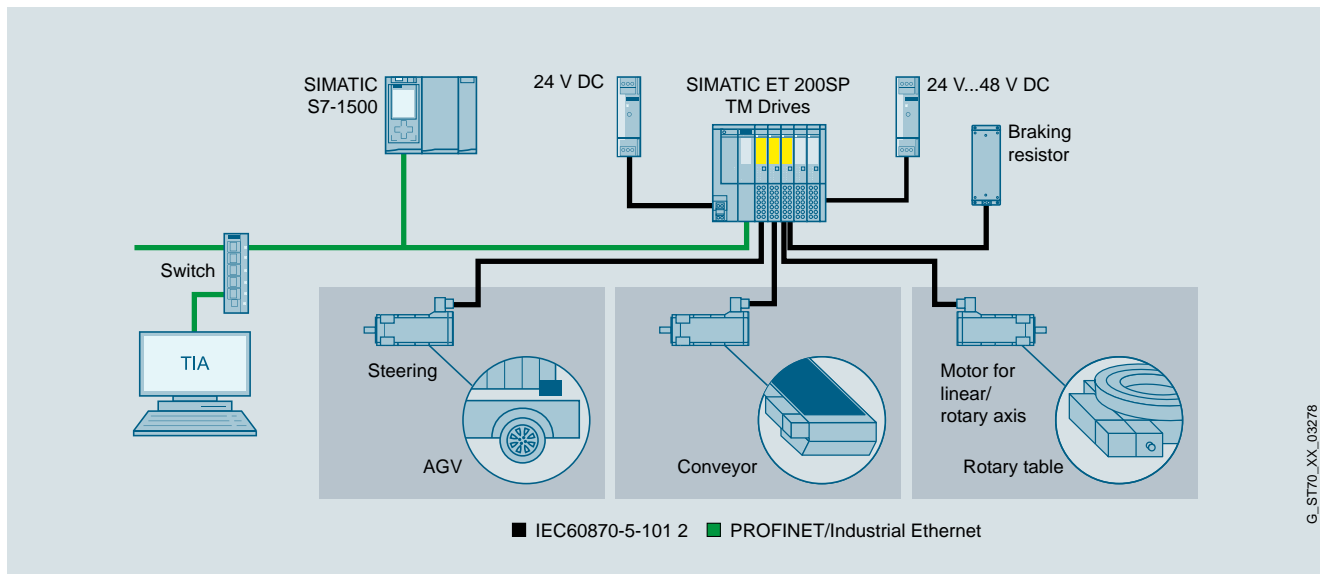
- The F-TM ServoDrive ST as a new member of the SIMATIC MICRO-DRIVE family
- The BaseUnit (U0)
- Motors with gearbox for flexible use and
- Connecting cables.

Further information on the distributed I/O system SIMATIC ET 200SP is available on the Internet at <http://www.siemens.com/et200sp>

#### Characteristics

- PROFIdrive profile via PROFINET
- Hardware STO
- Digital input
- Integrated braking chopper
- Encoder connection for
  - IQ encoders
  - Incremental encoders

Overview



Application example TM drive controller

Variant	Power	Device width
Standard	280 W	20 mm

More information:

<https://www.siemens.com/micro-drive>

Ordering data

Article No.

**F-TM ServoDrive drive controller' for SIMATIC MICRO-DRIVE**

Variant

- Standard V1; 24 ... 48 V, 5 A with hardware STO and integrated braking chopper

**6BK1136-6AB00-0BU0**

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

I/O modules &gt; SIMATIC ET 200SP drive controllers &gt; SIMATIC MICRO-DRIVE F-TM ServoDrive ST

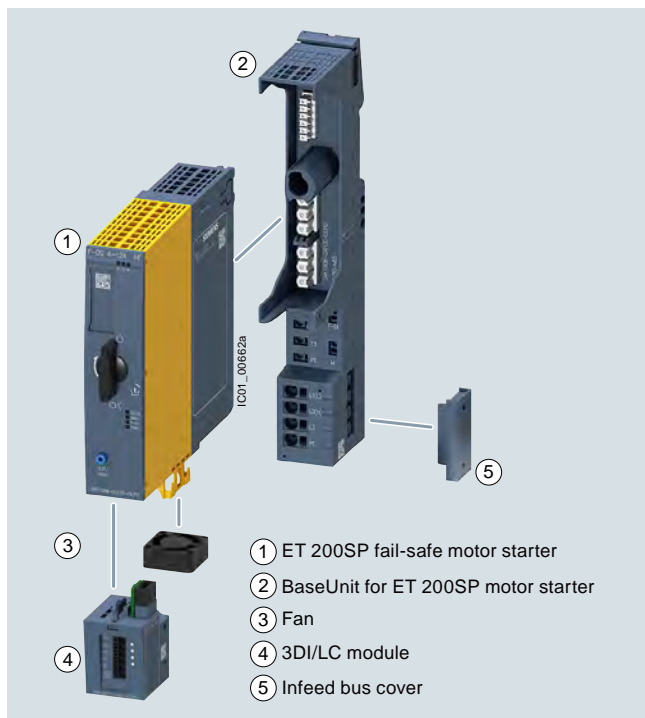
**Technical specifications**

Article number	<b>6BK1136-6AB00-0BU0</b> F-TM ServoDrive 1x24...48V 5A ST
<b>General information</b>	
Product type designation	F-TM ServoDrive 1x24 ... 48 V 5 A ST
Product description	Control of EC motors
<b>Product function</b>	
• I&M data	Yes
• Isochronous mode	No
• Four-quadrant operation	Yes
• Safety Functions	Yes; Drive controller with hardwired STO
<b>Protection function</b>	
• Undervoltage protection	Yes
• Overvoltage protection	Yes
• Overload protection	Yes
• Ground-fault protection	No
• Short-circuit protection	Yes
<b>Installation type/mounting</b>	
Type of ventilation	Convection cooling
<b>Supply voltage</b>	
Design of the power supply	24 ... 48 V DC, SELV / PELV
<b>Output voltage</b>	
Rated value, min.	24 V
Rated value, max.	48 V
<b>Output current</b>	
Current output (rated value)	5 A
Output current, max.	10 A
Output frequency	420 Hz
<b>Encoder supply</b>	
Number of outputs	1
<b>5 V encoder supply</b>	
• 5 V	Yes
• Short-circuit protection	Yes
• Output current, max.	120 mA
<b>Digital inputs</b>	
Number of digital inputs	1; + 1 input for message signal
Number of safety inputs	1; For STO, antivalent (2-pin) - 24 V DC
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes; up to 500 Hz per channel
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes
• ERROR LED	Yes
<b>Integrated Functions</b>	
<b>Position detection</b>	
• Incremental acquisition	Yes

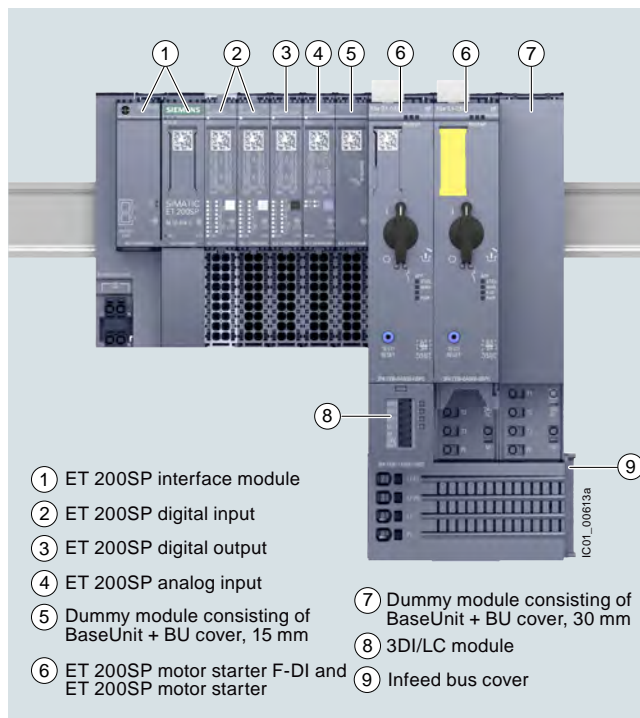
Article number	<b>6BK1136-6AB00-0BU0</b> F-TM ServoDrive 1x24...48V 5A ST
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
China RoHS compliance	Yes
Standard for EMC according to EN 61800-3	Yes, according to second environment Category C2 acc. EN 61800-3
Standard for drive acc. to EN 61800-5-1	Yes
Standard for drive acc. to EN 61800-5-2	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	Category 3, performance level d, according to EN ISO 13849-1:2015
• SIL according to DIN EN 61800-5-2	SIL 2 according to EN 61800-5-2:2017
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• horizontal installation, max.	60 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
• vertical installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• vertical installation, max.	50 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	3 000 m
<b>Cables</b>	
Cable length for motor, shielded, max.	10 m
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	55 g
<b>Other</b>	
Braking chopper	Yes

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## Overview



Motor starter, BaseUnit, fan and 3DI/LC control module



3RK1308 motor starter in the ET 200SP I/O system

## More information

Homepage, see [www.siemens.com/sirius-motor-starter-et200sp](http://www.siemens.com/sirius-motor-starter-et200sp)  
Industry Mall, see [www.siemens.com/product?3RK1308](http://www.siemens.com/product?3RK1308)

TIA Selection Tool, see [www.siemens.com/TST](http://www.siemens.com/TST)

## ET 200SP motor starters

ET 200SP is a scalable and extremely flexible modular I/O system with IP20 degree of protection.

As I/O modules, the ET 200SP motor starters are an integral part of this I/O system. They are switching and protection devices for single- and three-phase loads and are available as direct-on-line or reversing starters.



SIMATIC ET 200SP motor starter video

## Basic functionality

All versions of the ET 200SP motor starter feature the following functionality:

- Fully pre-wired motor starters for switching and protecting any AC loads up to 5.5 kW from 48 V AC to 500 V AC
- Disconnection possible via fail-safe motor starters up to SIL 3 and PL e Cat. 4
- With self-assembling 32 A power bus, i.e. the load voltage is only fed in once for a group of motor starters
- All control supply voltages connected only once, i.e. when modules are added they are automatically connected to the next module
- Hot swapping is permissible
- Digital inputs can optionally be used via a 3DI/LC module

- Control of the motor starter from the control system and diagnostics status via the cyclic process image
- Diagnostics capability for active monitoring of the switching and protection functions
- The signal states in the process image of the motor starter provide information about protective devices (short circuit or overload), the switching states of the motor starter, and system faults.

## Starter Kit

The 3RK1908-1SK00 Starter Kit is a favorably priced complete package for switching and monitoring motors in the ET 200SP system, see page 10/233.

It contains:

- a 3RK1308-0BC00-0CP0 reversing starter (0.9 to 3 A)
- a 3RK1908-0AP00-0AP0 BaseUnit with 500 V and 24 V AC/DC infeed
- an EMC distance module (consisting of 6ES7193-6BP00-0BA0 BaseUnit plus 6ES7133-6CV15-1AM0 BU cover 15 mm)

## Use of fan

For motor starters with a 12 A rated current, the 3RW4928-8VB00 fan is included in the scope of supply.

This fan can also be ordered as an option for motor starters with lower rated currents, if the boundary conditions demand this. For information on the ambient conditions for the use of motor starters, see chapter "Product overview" in the Equipment Manual.

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > ET 200SP motor starters

#### Designing interference-free motor starters

For interference-free operation of the ET 200SP station in accordance with IEC 60947-4-2 standard, use a dummy module before the first motor starter. The dummy module consists of the 6ES7193-6BP00-0BA0 or 6ES7193-6BP00-0DA0 BaseUnit and the 6ES7133-6CV15-1AM0 BU cover 15 mm.

The 15 mm BU cover protects the plug contacts of the BaseUnit against dirt.

#### Electromechanical switching devices in series with hybrid motor starters

Switching an inductive load - in particular of motors <1 kW with high inductance - with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

The resulting faults/damage can be prevented by first disconnecting with the hybrid motor starter or by using EMC suppression modules:

- For 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor, see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10047575>
- For motor suppression modules that are fitted in the main circuit, see page 10/233

#### Note:

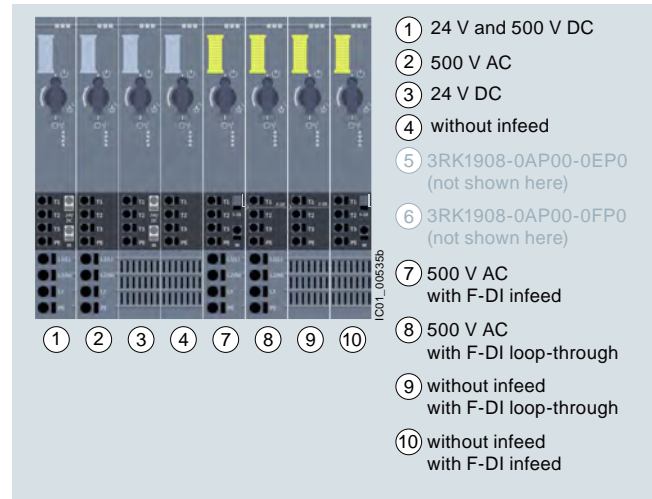
For more information, see <https://support.industry.siemens.com/cs/ww/en/view/109758696>.

#### 3DI/LC control module

This is a digital input module with three inputs for local motor starter functions such as "manual local control", "implementation of fast inputs" or "end position disconnection". For a list of all the functions permitted by the 3DI/LC module, see chapter "Overview of functions" in the Equipment Manual.

The module is plugged into the front of the motor starter from which it is supplied with a 24 V DC operating voltage.

#### BaseUnits for motor starters



View of the BaseUnit infeeds for the motor starters

BaseUnits are components for accommodating the ET 200SP I/O modules.

The self-assembling voltage buses integrated into the BaseUnits reduce wiring outlay to the single infeed (both of auxiliary and load voltage).

All modules following on the right are automatically supplied upon plugging the BaseUnits together, if BaseUnits are inserted with routing.

The rugged design and keyed connection technology enables use in harsh industrial conditions.

The BaseUnits are available with various infeeds for the motor starters.



## Article No. scheme

Product versions		Article number	
<b>Motor starters</b>		<b>3RK1308 - 0</b> <input type="checkbox"/> <input type="checkbox"/> <b>0 0 - 0 C P 0</b>	
Product function	Direct-on-line starters	<b>A</b>	For motor standard output 0.09 ... 5.5 kW <sup>1)</sup>
	Reversing starters	<b>B</b>	For motor standard output 0.09 ... 5.5 kW <sup>1)</sup>
	Fail-safe direct-on-line starters	<b>C</b>	For motor standard output 0.09 ... 5.5 kW <sup>1)</sup>
	Fail-safe reversing starters	<b>D</b>	For motor standard output 0.09 ... 5.5 kW <sup>1)</sup>
Current range	0.1 ... 0.4 A	<b>A</b>	Maximum current-carrying capacity when starting 4 A
	0.3 ... 1 A	<b>B</b>	Maximum current-carrying capacity when starting 10 A
	0.9 ... 3 A	<b>C</b>	Maximum current-carrying capacity when starting 30 A
	2.8 ... 9 A	<b>D</b>	Maximum current-carrying capacity when starting 90 A
	4 ... 12 A	<b>E</b>	Including fan (3RW4928-8VB00), maximum current-carrying capacity when starting 100 A
Example		<b>3RK1308 - 0 A D 0 0 - 0 C P 0</b>	

<sup>1)</sup> For standard motors: Single- or three-phase asynchronous motors, single-phase asynchronous motors, single-phase asynchronous motors, at 400 V AC and 500 V AC; the actual startup characteristics of the motor as well as its rated data are important factors here.

Product versions		Article number	
<b>BaseUnit</b>		<b>3RK1908 - 0 A P 0 0 - 0</b> <input type="checkbox"/> <b>P 0</b>	
BU infeed	24 V and 500 V AC	<b>A</b>	
	24 V DC	<b>B</b>	
	500 V AC	<b>C</b>	
	without infeed	<b>D</b>	
	500 V AC	<b>G</b>	with F-DI infeed
	500 V AC	<b>H</b>	with F-DI loop-through
	without infeed	<b>J</b>	with F-DI loop-through
	without infeed	<b>K</b>	with F-DI infeed
Example		<b>3RK1908 - 0 A P 0 0 - 0 A P 0</b>	

Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

**Benefits****Product advantages**

The ET 200SP motor starters offer a number of advantages:

- Fully integrated into the ET 200SP I/O system (including TIA Selection Tool and TIA Portal)
- High degree of flexibility when it comes to safety applications via SIMATIC F-CPU or SIRIUS 3SK safety relays up to SIL 3 and PL e Cat. 4.
- Simple, integrated current value transmission
- Extensive parameterization by means of TIA Portal
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Greater endurance and reduced heat losses thanks to hybrid technology
- Less space required in the control cabinet (20 to 80%) as a result of greater functional density (direct-on-line and reversing starters in same width)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs via 3DI/LC control module
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower overheads for stock keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:3)
- Technology has lower inherent power losses than speed-controlled drive systems, so that less cooling (and smaller footprint) are possible

- The ET 200SP motor starters can be used with highly energy-efficient IE3/IE4 motors, [see Application Manual](#). Take the current characteristics of the connected motor and motor starter into account when dimensioning. In addition to the rated current, the maximum permissible current range of the motor starter and the ratio of the rated current to the starting current of the motor are relevant.

**Standards and approvals**

- IEC/EN 60947-4-2
- UL 60947-4-2
- CSA
- ATEX
- IEC 61508-1: SIL 3
- ISO 13849: PL e
- CCC approval for China

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### I/O modules > ET 200SP motor starters

#### Application

The ET 200SP motor starters are suitable for the following applications:

- Switching and monitoring of
  - Three-phase motors with overload and short-circuit protection (e.g. 400 V asynchronous motors for secondary drives in conveyor systems)
  - Single-phase motors with overload and short-circuit protection (e.g. 230 V motors for pump applications)
  - Resistive loads by means of current value and diagnostics via the maintenance function (e.g. for heaters)
- Plant monitoring and energy management in conveyor systems:
  - By means of the phase asymmetry and zero current detection during current measurement, for example, drive belt monitoring and blocking monitoring are possible.

- Track switching and lifting table control in conveyor systems: Track switches can be implemented using the quick stop function and lifting table controls by means of the "immediate end position disconnection" function without any laborious programming.
- Safe isolation of the drive from main power supply: The isolating functions according to IEC 60947-1 offer protection against inadvertent activation during plant maintenance.

#### Motor starters in the process industry

For the ET 200SP motor starters, special BaseUnits are available that enable the device to be used in the ET 200SP HA I/O system, too. This is typically used in process engineering applications.

For more information, see <https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10398144?tree=CatalogTree>.

#### Technical specifications

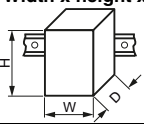
##### More information

Industry Mall, see [www.siemens.com/product?3RK1308](http://www.siemens.com/product?3RK1308)

Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/109479973>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/21800/faq>

#### ET 200SP motor starters

Article number		3RK1308-0.A00-0CP0	3RK1308-0.B00-0CP0	3RK1308-0.C00-0CP0	3RK1308-0.D00-0CP0	3RK1308-0.E00-0CP0
<b>Product category</b>		<b>Motor starters</b>				
<b>General technical specifications:</b>						
<b>Width x height x depth</b>	mm	30 × 142 × 150				
						
<b>Design of the switching contact</b>		Hybrid				
<b>Design of the motor protection</b>		Electronic				
<b>Installation altitude at height above sea level, maximum</b>	m	4 000, for derating <a href="#">see manual</a>				
<b>Mounting position</b>		Vertical, horizontal, flat (observe derating)				
<b>Type of mounting</b>		Can be plugged into BaseUnit				
<b>Ambient temperature</b>						
• During operation	°C	-25 ... +60				
• During transport	°C	-40 ... +70				
• During storage	°C	-40 ... +70				
<b>Relative humidity during operation</b>	%	10 ... 95				
<b>Vibration resistance</b>		15 mm up to 6 Hz; 2 g up to 500 Hz				
<b>Shock resistance</b>		6 g / 11 ms				
<b>Topic Protection class IP on the front</b> acc. to IEC 60529		IP20				
<b>Touch protection on the front</b> acc. to IEC 60529		Finger-safe				
<b>Type of coordination</b>		1				
<b>Electrical data:</b>						
<b>Supply voltage at DC rated value</b>	V	24				
<b>Operational power for AC-53a at 400 V rated value</b>	kW	0.12	0.25	1.1	4	5.5
<b>Operating frequency, rated value</b>	Hz	50 ... 60				
<b>Ultimate short-circuit current breaking capacity (<math>I_{cu}</math>)</b>						
• at 400 V rated value	kA	55				
• at 500 V rated value	kA	55				
<b>Adjustable current response value of the inverse-time delayed overload release</b>	A	0.1 ... 0.4	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
<b>Max. current carrying capacity at startup</b>	A	4	10	30	90	100
<b>Max. permissible voltage for protective separation between main and auxiliary circuit</b>	V	500				
<b>Insulation voltage, rated value</b>	V	500				
<b>Trip class</b>		CLASS 5 and 10 adjustable				

**BaseUnits for motor starters**

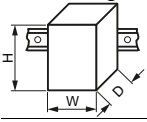
Article number	3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0 3RK1908-0AP00-0GP0 3RK1908-0AP00-0HP0	3RK1908-0AP00-0DP0 3RK1908-0AP00-0JP0 3RK1908-0AP00-0KP0
<b>Product designation</b>	<b>BaseUnit</b>			
<b>General technical specifications:</b>				
<b>Width x height x depth</b>	mm	30 × 215 × 75		
<b>Ambient temperature</b>				
• During operation	°C	-25 ... +60		
• During transport	°C	-40 ... +70		
• During storage	°C	-40 ... +70		
<b>Protection class IP on the front</b> acc. to IEC 60529	IP20			
<b>Touch protection on the front</b> acc. to IEC 60529	Finger-safe			
<b>Connections/terminals:</b>				
<b>Type of connectable conductor cross-sections</b>				
• At the inputs for supply voltage				
- Solid		1 x 0.5 ... 2.5 mm <sup>2</sup>	--	--
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm <sup>2</sup>	--	--
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm <sup>2</sup>	--	--
- Solid for AWG cables		1 x 20 ... 12	--	--
• For infeed				
- Solid		1 x 1 ... 6 mm <sup>2</sup>	--	1 x 1 ... 6 mm <sup>2</sup>
- Finely stranded with end sleeve		1 x 1 ... 6 mm <sup>2</sup>	--	1 x 1 ... 6 mm <sup>2</sup>
- Finely stranded without end sleeve		1 x 1 ... 6 mm <sup>2</sup>	--	1 x 1 ... 6 mm <sup>2</sup>
- Solid for AWG cables		1 x 18 ... 10	--	1 x 18 ... 10
• For load-side outgoing feeder				
- Solid		1 x 0.5 ... 2.5 mm <sup>2</sup>		
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm <sup>2</sup>		
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm <sup>2</sup>		
- Solid for AWG cables		1 x 20 ... 12		
<b>Type of electrical connection for auxiliary and control circuits</b>	Spring-loaded terminals (push-in)			
<b>Miscellaneous:</b>				
<b>Type of screwdriver tip</b>	Slotted			
<b>Size of screwdriver tip</b>	Standard screwdriver 0.6 mm x 3.5 mm			

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**I/O modules > ET 200SP motor starters****3DI/LC control module**

Article number	<b>3RK1908-1AA00-0BP0</b>	
Product designation	<b>3DI/LC control module</b>	
<b>General technical specifications:</b>		
Width x height x depth	mm	30 × 54.5 × 42.3
		
Type of product	Accessories	
Number of digital inputs	4	
Installation altitude at height above sea level, maximum	m	2 000
Mounting position	Vertical, horizontal, flat	
Type of mounting	Can be plugged onto motor starter	
Ambient temperature		
• During operation	°C	-25 ... +60
• During transport	°C	-40 ... +70
• During storage	°C	-40 ... +70
<b>Connections/terminals:</b>		
Connectable conductor cross-section for auxiliary contacts		
• Solid or stranded	mm <sup>2</sup>	0.2 ... 1.5
• Finely stranded with end sleeve	mm <sup>2</sup>	0.25 ... 1.5
• Finely stranded without end sleeve	mm <sup>2</sup>	0.2 ... 1.5
AWG number as coded connectable conductor cross-section	24 ... 16	
Type of electrical connection for auxiliary and control circuits	Spring-loaded terminals (push-in)	
<b>Electrical data:</b>		
Type of voltage of the control supply voltage	DC	
Control supply voltage at DC rated value	V	20.4 ... 28.8
<b>Miscellaneous:</b>		
Type of screwdriver tip	Slotted	
Size of screwdriver tip	Standard screwdriver 0.6 mm x 3.5 mm	

### Selection and ordering data

Adjustable current response value of the inverse-time delayed overload release	Max. current carrying capacity at startup	Article No.
A	A	

#### Motor starters

##### Direct-on-line starters



3RK1308-0AB00-0CP0

0.1 ... 0.4	4
0.3 ... 1	10
0.9 ... 3	30
2.8 ... 9	90
4 ... 12	100

**NEW**

3RK1308-0AA00-0CP0  
3RK1308-0AB00-0CP0  
3RK1308-0AC00-0CP0  
3RK1308-0AD00-0CP0  
3RK1308-0AE00-0CP0

##### Reversing starters



3RK1308-0BB00-0CP0

0.1 ... 0.4	4
0.3 ... 1	10
0.9 ... 3	30
2.8 ... 9	90
4 ... 12	100

**NEW**

3RK1308-0BA00-0CP0  
3RK1308-0BB00-0CP0  
3RK1308-0BC00-0CP0  
3RK1308-0BD00-0CP0  
3RK1308-0BE00-0CP0

##### Fail-safe direct-on-line starters



3RK1308-0CE00-0CP0

0.1 ... 0.4	4
0.3 ... 1	10
0.9 ... 3	30
2.8 ... 9	90
4 ... 12	100

**NEW**

3RK1308-0CA00-0CP0  
3RK1308-0CB00-0CP0  
3RK1308-0CC00-0CP0  
3RK1308-0CD00-0CP0  
3RK1308-0CE00-0CP0

##### Fail-safe reversing starters



3RK1308-0DE00-0CP0

0.1 ... 0.4	4
0.3 ... 1	10
0.9 ... 3	30
2.8 ... 9	90
4 ... 12	100

**NEW**

3RK1308-0DA00-0CP0  
3RK1308-0DB00-0CP0  
3RK1308-0DC00-0CP0  
3RK1308-0DD00-0CP0  
3RK1308-0DE00-0CP0

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**I/O modules > ET 200SP motor starters**

Type of product	Operational voltage of the AC infeed	Supply voltage of the DC infeed	Push-in terminals 
	V	V	Article No.

**BaseUnits<sup>1)</sup>**

3RK1908-0AP00-0AP0


**For motor starters**

• with AC/DC infeed	500	24	<b>3RK1908-0AP00-0AP0</b>
• with DC infeed	--	24	<b>3RK1908-0AP00-0BP0</b>
• with AC infeed	500	--	<b>3RK1908-0AP00-0CP0</b>
• without infeed	--	--	<b>3RK1908-0AP00-0DP0</b>

**For fail-safe motor starters NEW**

• with AC infeed, with F-DI infeed for fail-safe motor starters	500	--	<b>3RK1908-0AP00-0GP0</b>
• with AC infeed, with F-DI loop-through for fail-safe motor starters	500	--	<b>3RK1908-0AP00-0HP0</b>
• without AC/DC infeed, with F-DI loop-through for fail-safe motor starters	--	--	<b>3RK1908-0AP00-0JP0</b>
• without AC/DC infeed, with F-DI infeed for fail-safe motor starters	--	--	<b>3RK1908-0AP00-0KP0</b>

<sup>1)</sup> The voltage is looped-through from BaseUnits with infeed to subsequent BaseUnits without infeed.


Type of product	Supply voltage at DC rated value	Loop through the potential group from the left	Push-in terminals 
	V		Article No.

**BaseUnits**

6ES7193-6BP00-0BA0

**For dummy modules**

• dark, looping through the potential group	24	Yes	<b>6ES7193-6BP00-0BA0</b>
• light, opening a new potential group	24	No	<b>6ES7193-6BP00-0DA0</b>

Control supply voltage at DC rated value	Product function	Push-in terminals 
	Local control    Digital inputs parameterizable	Article No.

V

**3DI/LC control module**

3RK1908-1AA00-0BP0

20.4 ... 28.8	Yes	Yes	<b>3RK1908-1AA00-0BP0</b>
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	Product designation	Type of product	Article No.
<b>Accessories</b>			
	<b>BU cover 15 mm</b>	for BaseUnits Type A0 or A1	<b>6ES7133-6CV15-1AM0</b>
6ES7133-6CV15-1AM0			
	<b>BU cover 30 mm</b>	For protection of empty slots, 30 mm	<b>3RK1908-1CA00-0BP0</b>
3RK1908-1CA00-0BP0			
	<b>Infeed bus cover</b> (1 bag containing 10 covers)	For ET 200SP	<b>3RK1908-1DA00-2BP0</b>
3RK1908-1DA00-2BP0			
	<b>Mechanical bracket</b> (1 bag containing 5 mechanical brackets)	Mechanical, for ET 200SP	<b>3RK1908-1EA00-1BP0</b>
3RK1908-1EA00-1BP0			
	<b>Fan</b>	Can be used for 3RK1308	<b>3RW4928-8VB00</b>
3RW4928-8VB00			
	<b>Motor suppression module</b> • Square		<b>3RK1911-6EA00</b>
3RK1911-6EA00			
	• Round		<b>3RK1911-6EB00</b>
3RK1911-6EB00			
	<b>Starter Kit <span style="color: orange;">NEW</span></b>	consists of 3RK1308-0BC00-0CP0 reversing starter (0.9 ... 3 A), 3RK1908-0AP00-0AP0 BaseUnit with 500 V and 24 V AC/DC infeed, and EMC distance module (consisting of 6ES7193-6BP00-0BA0 BaseUnit plus 6ES7133-6CV15-1AM0 BU cover 15 mm)	<b>3RK1908-1SK00</b>
3RK1908-1SK00			

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

Pneumatics > Valve terminals AirLINE SP Typ 8647 (Bürkert Co.)

### Overview



- For pneumatic control of actuators with ET 200SP
- Can be used together with system and IO components of the ET 200SP distributed I/O system.
- Product of the product partners Bürkert Fluid Control Systems, and can only be obtained from Bürkert Fluid Control Systems.

#### Note

Product partners are external companies outside Siemens AG and its associated companies. Information and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the particular product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability and makes no guarantee for for these products or for the connection with these products of the product partners. Please refer also to the note on exemption from liability/use of hyperlinks.

### Benefits

- High process safety by using non-return valves and pneumatic infeed modules with pressure monitoring.
- System-wide detailed diagnostics in plain text, and also locally on an LC display
- Quick and easy valve change during operation (hot swapping)
- Reduced number of components in the control cabinet (compact control cabinet is possible)
- Quick installation & configuration of the pneumatic connections

### Application

Valve terminals are widely used in industrial automation, and serve as pilot valves for controlling actuators in the food, pharmaceutical and water treatment industries. In combination with the AirLINE SP, type 8647 from the Bürkert Co., the ET 200SP forms a universal interface between process and plant control, and enables the flexible, modular structure of pilot valves and I/O modules. The valve terminal can also be attached to a control cabinet floor with an AirLINE Quick Adapter, which further reduces the space required in the control cabinet, and significantly simplifies the pneumatic installation.

### More information

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly:

<http://www.burkert.com/en/type/8647>

#### Disclaimer of liability

This information and the descriptions have been compiled with great care. However, it is not possible for Siemens to verify that the data supplied by product partners is complete, correct and up-to-date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the products for the user per se.



## Overview



In terms of design and functionality, the SIMATIC ET 200SP PS single-phase load power supply with automatic range switching of the input voltage is perfectly matched to the SIMATIC ET 200SP. The SIMATIC component and the power supply are wired by means of uniform push-in terminal technology. The 24 V supply provides power to the ET 200SP system components such as the interface module, technology module and communications module, as well as the digital or analog inputs/outputs. Comprehensive certifications, such as UL or GL, facilitate universal use. Its extremely flat design also makes this power supply ideally suited for installation in compact on-site control boxes.

## Ordering data

## Article No.

**SIMATIC ET 200SP PS****6EP7133-6AB00-0BNO**

Stabilized power supply for  
SIMATIC ET 200SP  
Input: 120/230 V AC  
Output: 24 V DC/5 A

**SIMATIC ET 200SP PS****6EP7133-6AE00-0BNO**

Stabilized power supply for  
SIMATIC ET 200SP  
Input: 120/230 V AC  
Output: 24 V DC/10 A

## Technical specifications

Article number	6EP7133-6AB00-0BNO	6EP7133-6AE00-0BNO
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
<b>Input</b>		
Input	1-phase AC	1-phase AC
• Note	Automatic range selection	Automatic range selection
supply voltage		
• 1 at AC rated value	120 V	120 V
• 2 at AC rated value	230 V	230 V
input voltage		
• 1 at AC	85 ... 132 V	85 ... 132 V
• 2 at AC	170 ... 264 V	170 ... 264 V
Wide-range input	No	No
Overvoltage resistance	$2.3 \times V_{in \text{ rated}}$ , 1.3 ms	$2.3 \times V_{in \text{ rated}}$ , 1.3 ms
Mains buffering	at $V_{in} = 93/187 \text{ V}$	at $V_{in} = 93/187 \text{ V}$
Mains buffering at $I_{out \text{ rated}}$ , min.	20 ms; at $V_{in} = 93/187 \text{ V}$	20 ms; at $V_{in} = 93/187 \text{ V}$
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz
input current		
• at rated input voltage 120 V	2.16 A	4.34 A
• at rated input voltage 230 V	1.22 A	1.92 A
Switch-on current limiting (+25 °C), max.	45 A	60 A
$I^2t$ , max.	3.15 A <sup>2</sup> ·s	6.3 A <sup>2</sup> ·s
Built-in incoming fuse	T 3,15 A/250 V (not accessible)	T 6,3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	recommended LS switch: B/C 6 A/3 A	recommended LS switch: B/C 10 A/6 A

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Power supplies > 1-phase, 24 V DC (for SIMATIC ET 200SP)****Technical specifications**

Article number	6EP7133-6AB00-0BNO	6EP7133-6AE00-0BNO
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
<b>Output</b>		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	24 V	24 V
• output voltage at output 1 at DC rated value	24 V	24 V
Total tolerance, static $\pm$	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	1 %	1 %
Residual ripple peak-peak, max.	150 mV	150 mV
Residual ripple peak-peak, typ.	50 mV	50 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	240 mV	240 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	150 mV	150 mV
Adjustment range	22.8 ... 28 V	22.8 ... 28 V
product function output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for 24 V OK	Green LED for 24 V OK
Signaling	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"
On/off behavior	Overshoot of $V_{out} < 3 \%$	Overshoot of $V_{out} < 3 \%$
Startup delay, max.	0.3 s	0.3 s
Voltage rise, typ.	30 ms	30 ms
Rated current value $I_{out rated}$	5 A	10 A
Current range	0 ... 6 A	0 ... 12 A
• Note	5 A up to +60°C; +60 ... +70 °C: Derating 3%/K	10 A up to +60°C; +60 ... +70 °C: Derating 3%/K
supplied active power typical	120 W	240 W
short-term overload current		
• on short-circuiting during the start-up typical	15 A	30 A
• at short-circuit during operation typical	15 A	30 A
duration of overloading capability for excess current		
• on short-circuiting during the start-up	800 ms	750 ms
• at short-circuit during operation	800 ms	800 ms
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
<b>Efficiency</b>		
Efficiency at $V_{out rated}$ , $I_{out rated}$ , approx.	88 %	90 %
Power loss at $V_{out rated}$ , $I_{out rated}$ , approx.	17 W	26 W
power loss [W] during no-load operation maximum	2.7 W	2.8 W
<b>Closed-loop control</b>		
Dynamic mains compensation ( $V_{in rated} \pm 15 \%$ ), max.	0.3 %	0.3 %
Dynamic load smoothing ( $I_{out}: 10/90/10 \%$ ), $U_{out} \pm$ typ.	3 %	3 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms

## Technical specifications

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
<b>Protection and monitoring</b>		
Output overvoltage protection	protection against overvoltage in case of internal fault $V_{out} < 31.8 \text{ V}$	protection against overvoltage in case of internal fault $V_{out} < 31.8 \text{ V}$
Current limitation	7 ... 7.5 A	14 ... 15 A
property of the output short-circuit proof	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic
enduring short circuit current RMS value		
• typical	7 A	14.1 A
overcurrent overload capability in normal operation	overload capability 150 % $I_{out \text{ rated}}$ up to 5 s/min	overload capability 150 % $I_{out \text{ rated}}$ up to 5 s/min
Overload/short-circuit indicator	-	-
<b>Safety</b>		
Primary/secondary isolation	Yes	Yes
galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class I	Class I
leakage current		
• maximum	3.5 mA	3.5 mA
• typical	1 mA	1 mA
Degree of protection (EN 60529)	IP20	IP20
<b>Approvals</b>		
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL61010-2-201, CSA C22.2 No.142), cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-Listed (UL61010-2-201, CSA C22.2 No.142), cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
certificate of suitability NEC Class 2	No	No
CB approval	Yes	Yes
certificate of suitability EAC approval	Yes	Yes
Marine approval	BV, DNV GL	BV, DNV GL
<b>EMC</b>		
Emitted interference	EN 61000-6-3 Class B	EN 61000-6-3 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>environmental conditions</b>		
ambient temperature		
• during operation	-30 ... +70 °C	-30 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>		
Connection technology	Push-in terminals	Push-in terminals
Connections		
• Supply input	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm <sup>2</sup>	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm <sup>2</sup>
• Auxiliary	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm <sup>2</sup>	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm <sup>2</sup>
• signaling contact	2 push-in terminals for 0.2 ... 2.5 mm <sup>2</sup>	2 push-in terminals for 0.2 ... 2.5 mm <sup>2</sup>
product function		
• removable terminal at input	Yes	Yes
• removable terminal at output	Yes	Yes

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Power supplies &gt; 1-phase, 24 V DC (for SIMATIC ET 200SP)

**Technical specifications**

Article number	6EP7133-6AB00-0BNO	6EP7133-6AE00-0BNO
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
width of the enclosure	160 mm	160 mm
height of the enclosure	117 mm	117 mm
depth of the enclosure	74 mm	74 mm
required spacing		
• top	50 mm	50 mm
• bottom	50 mm	50 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.5 kg	0.7 kg
product feature of the enclosure housing can be lined up	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
electrical accessories	Redundancy module, buffer module, selectivity module, DC UPS	Redundancy module, buffer module, selectivity module, DC UPS
MTBF at 40 °C	1 598 441 h	1 114 510 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

### Overview



With the BaseUnits (BUs), the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (gaps without I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High EMC interference immunity:
  - self-assembling shielded backplane bus
  - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module
  - system-integrated, space-saving shield connection for quick installation
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical and EMC loads
- Optional module-specific color identification of the terminals according to the color code CC
- Optional equipment marking using slide-in equipment labeling plates

An ET 200SP station can be expanded via one 'BU-Send' BaseUnit with a "BA-Send" BusAdapter plugged onto it with up to 16 modules from the ET 200AL series of I/O devices with IP67 protection.

### Ordering data

### Article No.

### Article No.

#### Type A0 BaseUnits

#### BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0**

#### BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

#### 2BU15-P16+A0+2DB

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A)

- Pack of 1 unit

**6ES7193-6BP60-0DA0**

#### BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the potential group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0**

#### BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0**

#### 2BU15-P16+A0+2B

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the potential group

- Pack of 1 unit

**6ES7193-6BP60-0BA0**

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**BaseUnits**

Ordering data	Article No.	Ordering data	Article No.
<b>Type B0 BaseUnits</b>		<b>Type F0 BaseUnits</b>	
<b>BU20-P12+A4+0B</b> BU type B0; BaseUnit (dark) with 12 push-in terminals (1 ... 12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the potential group; 1 unit • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP20-0BB0</b> <b>6ES7193-6BP20-2BB0</b>	<b>BU20-P8+A4+0B</b> BU type F0; BaseUnit (dark) with 8 push-in terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the potential group	<b>6ES7193-6BP20-0BF0</b>
<b>Type B1 BaseUnits</b>		<b>BaseUnits type U0</b>	
<b>BU20-P12+A0+4B</b> BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the potential group; 1 unit • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP20-0BB1</b> <b>6ES7193-6BP20-2BB1</b>	<b>BU20-P16+A0+2D</b> BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP00-0DU0</b> <b>6ES7193-6BP00-2DU0</b>
<b>Type C0 BaseUnits</b>		<b>BU20-P16+A0+2B</b> BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	<b>6ES7193-6BP00-0BU0</b> <b>6ES7193-6BP00-2BU0</b>
<b>BU20-P6+A2+4D</b> BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new potential group	<b>6ES7193-6BP20-0DC0</b>	<b>Station expansion with IP67 I/O system ET 200AL</b>	
<b>Type C1 BaseUnits</b>		<b>BaseUnit BU-Send</b>	<b>6ES7193-6BN00-0NE0</b>
<b>BU20-P6+A2+4B</b> BU type C1; BaseUnit (dark) with 6 push-in terminals (1 ... 6) to the module and 2 AUX terminals; bridged to the left	<b>6ES7193-6BP20-0BC1</b>	<b>ET 200SP BusAdapter BA-Send 1 x FC</b>	<b>6ES7193-6AS00-0AA0</b>
<b>Type D0 BaseUnits</b>		<b>Accessories</b>	
<b>BU20-P12+A0+0B</b> BU type D0; BaseUnit (dark) with 12 push-in terminals, without AUX terminals, bridged to the left	<b>6ES7193-6BP00-0BD0</b>	<b>Equipment labeling plate</b>	<b>6ES7193-6LF30-0AW0</b> 10 sheets of 16 labels
<b>Type A1 BaseUnits (with temperature detection)</b>		<b>BU cover</b>	For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide
<b>BU15-P16+A0+12D/T</b> BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new potential group (max. 10 A)	<b>6ES7193-6BP40-0DA1</b>	<b>Shield connection</b>	<b>6ES7133-6CV15-1AM0</b> <b>6ES7133-6CV20-1AM0</b> 5 shield supports and 5 shield terminals
<b>BU15-P16+A0+2D/T</b> BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new potential group (max. 10 A)	<b>6ES7193-6BP00-0DA1</b>		
<b>BU15-P16+A0+12B/T</b> BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the potential group	<b>6ES7193-6BP40-0BA1</b>		
<b>BU15-P16+A0+2B/T</b> BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the potential group	<b>6ES7193-6BP00-0BA1</b>		

## Ordering data

## Color-coded labels

- Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units
- Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units
- Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units

## Article No.

6ES7193-6CP01-2MA0

6ES7193-6CP01-4MA0

6ES7193-6CP02-2MA0

6ES7193-6CP02-4MA0

6ES7193-6CP03-2MA0

6ES7193-6CP04-2MA0

6ES7193-6CP71-2AA0

6ES7193-6CP72-2AA0

6ES7193-6CP73-2AA0

## Color-coded labels (continued)

- Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, BU type A1 with push-in terminals; 10 units
- Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units
- Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units
- Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units
- Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units
- Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units
- Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units
- Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units

## Article No.

6ES7193-6CP74-2AA0

6ES7193-6CP81-2AB0

6ES7193-6CP82-2AB0

6ES7193-6CP83-2AB0

6ES7193-6CP41-2MB0

6ES7193-6CP84-2AC0

6ES7193-6CP85-2AC0

6ES7193-6CP86-2AC0

## Technical specifications

Article number	6ES7193-6BP20-0DA0	6ES7193-6BP00-0DA0	6ES7193-6BP60-0DA0	6ES7193-6BP20-0BA0	6ES7193-6BP00-0BA0	6ES7193-6BP60-0BA0
	BaseUnit Type A0, BU15-P16+A10+2D	BaseUnit Type A0, BU15-P16+A0+2D	2-slot BU Typ A0, 2BU15-P16+A0+2DB, PU 1	BaseUnit Type A0, BU15-P16+A10+2B	BaseUnit Type A0, BU15-P16+A0+2B	2-slot BU Typ A0, 2BU15-P16+A0+2B, PU 1
<b>General information</b>						
Product type designation	BU type A0	BU type A0	2-fold BU type A0	BU type A0	BU type A0	2-fold BU type A0
<b>Hardware configuration</b>						
<b>Slots</b>						
• Number of slots	1; Type A0	1; Type A0	2; Type A0	1; Type A0	1; Type A0	2; Type A0
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>						
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Connection method</b>						
<b>Terminals</b>						
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>
• Conductor cross-section, max.	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**BaseUnits****Technical specifications**

Article number	<b>6ES7193-6BP20-0DA0</b> BaseUnit Type A0, BU15-P16+A10+2D	<b>6ES7193-6BP00-0DA0</b> BaseUnit Type A0, BU15-P16+A0+2D	<b>6ES7193-6BP60-0DA0</b> 2-slot BU Typ A0, 2BU15-P16+A0+2DB, PU 1	<b>6ES7193-6BP20-0BA0</b> BaseUnit Type A0, BU15-P16+A10+2B	<b>6ES7193-6BP00-0BA0</b> BaseUnit Type A0, BU15-P16+A0+2B	<b>6ES7193-6BP60-0BA0</b> 2-slot BU Typ A0, 2BU15-P16+A0+2B, PU 1
• Number of process terminals to I/O module	16	16	16; Pro slot	16	16; Pro slot	16; Pro slot
• Number of terminals to AUX bus	10	0	0	10	0	0
• Number of add-on terminals	0	0	0	0	0	0
• Number of terminals with connection to P1 and P2 bus	2	2	2; Pro slot	2	2; Pro slot	2; Pro slot
<b>Dimensions</b>						
Width	15 mm	15 mm	30 mm	15 mm	15 mm	30 mm
Height	141 mm	117 mm	117 mm	141 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
<b>Weights</b>						
Weight, approx.	50 g	40 g	80 g	50 g	40 g	80 g
Article number	<b>6ES7193-6BP20-0BB0</b> BaseUnit Type B0, BU20-P12+A4+0B	<b>6ES7193-6BP20-0BB1</b> BaseUnit Type B1, BU20-P12+A0+4B, PU 1	<b>6ES7193-6BP20-0DC0</b> BaseUnit Type C0, BU20-P6+A2+4D	<b>6ES7193-6BP20-0BC1</b> BaseUnit Type C1, BU20-P6+A2+4B	<b>6ES7193-6BP00-0BD0</b> BaseUnit Type D0, BU20-P12+A0+0B	<b>6ES7193-6BP20-0BF0</b> BaseUnit Type F0, BU20-P8+A4+0B
<b>General information</b>						
Product type designation	BU type B0	BU type B1	BU type C0	BU type C1	BU type D0	BU type F0
<b>Hardware configuration</b>						
<b>Slots</b>						
• Number of slots	1	1	1	1; Type C1	1; Type D0	1; Type F0
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>						
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
<b>Connection method</b>						
<b>Terminals</b>						
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>
• Conductor cross-section, max.	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>
• Number of process terminals to I/O module	12; Pro slot	12; Pro slot	12; Pro slot	16; Pro slot	12; Pro slot	12; Pro slot
• Number of terminals to AUX bus	0	0	0	0	0	0
• Number of add-on terminals	0	0	0	0	0	0
• Number of terminals with connection to P1 and P2 bus	0; Pro slot	0; Pro slot	0; Pro slot	2; Pro slot	0; Pro slot	0; Pro slot
<b>Dimensions</b>						
Width	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Height	117 mm	117 mm	117 mm	117 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
<b>Weights</b>						
Weight, approx.	48 g	48 g	47 g	47 g	47 g	48 g



### Technical specifications

Article number	6ES7193-6BP40-0DA1 BaseUnit Type A1, BU15-P16+A0+12D/T	6ES7193-6BP00-0DA1 BaseUnit Type A1, BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 BaseUnit Type A1, BU15-P16+A0+12B/T	6ES7193-6BP00-0BA1 BaseUnit Type A1, BU15-P16+A0+2B/T
<b>General information</b>				
Product type designation	BU type A1	BU type A1	BU type A1	BU type A1
<b>Hardware configuration</b>				
<b>Slots</b>				
• Number of slots	1; Type A1	1; Type A1	1; Type A1	1; Type A1
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Connection method</b>				
<b>Terminals</b>				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>	0.14 mm <sup>2</sup>
• Conductor cross-section, max.	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>
• Number of process terminals to I/O module	16	16	16	16
• Number of terminals to AUX bus	0	0	0	0
• Number of add-on terminals	2x5	0	2x5	0
• Number of terminals with connection to P1 and P2 bus	2	2	2	2
<b>Dimensions</b>				
Width	15 mm	15 mm	15 mm	15 mm
Height	141 mm	117 mm	141 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm
<b>Weights</b>				
Weight, approx.	50 g	40 g	50 g	40 g
Article number	<b>6ES7193-6BP00-0DU0</b> BaseUnit Type U0, BU20-P16+A0+2D, PU 1		<b>6ES7193-6BP00-0BU0</b> BaseUnit Type U0, BU20-P16+A0+2B, PU 1	
<b>General information</b>				
Product type designation	BU type U0		BU type U0	
<b>Hardware configuration</b>				
<b>Slots</b>				
• Number of slots	1		1	
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-30 °C		-30 °C	
• horizontal installation, max.	60 °C		60 °C	
• vertical installation, min.	-30 °C		-30 °C	
• vertical installation, max.	50 °C		50 °C	
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m	

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**BaseUnits****Technical specifications**

Article number	<b>6ES7193-6BP00-0DU0</b> BaseUnit Type U0, BU20-P16+A0+2D, PU 1	<b>6ES7193-6BP00-0BU0</b> BaseUnit Type U0, BU20-P16+A0+2B, PU 1
<b>Connection method</b>		
<b>Terminals</b>		
• Terminal type	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm <sup>2</sup> ; 0.2 mm <sup>2</sup> without wire end ferrule	0.14 mm <sup>2</sup> ; 0.2 mm <sup>2</sup> without wire end ferrule
• Conductor cross-section, max.	2.5 mm <sup>2</sup> ; 1.5 mm <sup>2</sup> with wire end ferrule	2.5 mm <sup>2</sup> ; 1.5 mm <sup>2</sup> with wire end ferrule
• Number of process terminals to I/O module	16	16
• Number of terminals to AUX bus	0	0
• Number of add-on terminals	0	0
• Number of terminals with connection to P1 and P2 bus	2	2
<b>Dimensions</b>		
Width	20 mm	20 mm
Height	117 mm	117 mm
Depth	35 mm	35 mm
<b>Weights</b>		
Weight, approx.	50 g	50 g

Article number	<b>6ES7193-6BN00-0NE0</b> ET 200SP, BaseUnit BU-Send
<b>Hardware configuration</b>	
<b>Slots</b>	
• Number of slots	1
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
<b>Dimensions</b>	
Width	20 mm
Height	117 mm
Depth	35 mm
<b>Weights</b>	
Weight, approx.	30 g

### Overview



With the BaseUnits, the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring

- Operation with module gaps (missing I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High immunity to electromagnetic interference due to
  - self-assembling shielded backplane bus
  - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module
  - system-integrated, space-saving shield connection for quick installation
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical load capacity
- Optional module-specific color identification of the terminals according to the color code CC
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS BaseUnits type A0</b>		<b>SIPLUS BaseUnits type A1 (with temperature detection)</b>	
<b>BU15-P16+A10+2D</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	<b>6AG1193-6BP20-7DA0</b>	<b>BU15-P16+A0+12D/T</b> (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and also 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	<b>6AG1193-6BP40-7DA1</b>
<b>BU15-P16+A0+2D</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA0</b>	<b>BU15-P16+A0+2D/T</b> (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA1</b>
<b>BU15-P16+A10+2B</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	<b>6AG1193-6BP20-7BA0</b>	<b>BU15-P16+A0+12B/T</b> (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and also 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	<b>6AG1193-6BP40-7BA1</b>
<b>BU15-P16+A0+2B</b> (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA0</b>	<b>BU15-P16+A0+2B/T</b> (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA1</b>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**SIPLUS BaseUnits**

Ordering data	Article No.	Article No.
<b>SIPLUS BaseUnits type B0</b>		<b>SIPLUS BaseUnits type F0</b>
<b>BU20-P12+A4+0B</b> (Extended temperature range and exposure to environmental substances) BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group; 1 unit	<b>6AG1193-6BP20-7BB0</b>	<b>BU20-P8+A4+0B</b> (Extended temperature range and exposure to environmental substances) BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group
<b>SIPLUS BaseUnits type B1</b>		<b>SIPLUS BaseUnits type U0</b>
<b>BU20-P12+A0+4B</b> (Extended temperature range and exposure to environmental substances) BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; 1 unit	<b>6AG1193-6BP20-7BB1</b>	<b>BU20-P16+A0+2D</b> (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)
<b>SIPLUS BaseUnits type C0</b>		<b>BU20-P16+A0+2B</b>
<b>BU20-P6+A2+4D</b> (Extended temperature range and exposure to environmental substances) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and 2 AUX terminals; new load group	<b>6AG1193-6BP20-7DC0</b>	<b>6AG1193-6BP00-7BU0</b> (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group
<b>SIPLUS BaseUnits type D0</b>		<b>Accessories</b>
<b>BU20-P12+A0+0B</b> (Extended temperature range and exposure to environmental substances) BU type D0; BaseUnit (dark) with 12 push-in terminals, without AUX terminals, bridged to the left	<b>6AG1193-6BP00-7BD0</b>	<b>SIPLUS Mounting Kit ET 200SP</b> Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with heights up to 117 mm, types A0/A1 without AUX or add-on terminals as well as types B0, B1, C0, C1, D0, U0
		<b>Other accessories</b> See SIMATIC ET 200SP BaseUnits, page 10/240

**Technical specifications**

Article number	<b>6AG1193-6BP00-7BA0</b>	<b>6AG1193-6BP00-7DA0</b>	<b>6AG1193-6BP20-7BA0</b>	<b>6AG1193-6BP20-7DA0</b>
Based on	<b>6ES7193-6BP00-0BA0</b> SIPLUS ET 200SP BU15-P16+A0+2B	<b>6ES7193-6BP00-0DA0</b> SIPLUS ET 200SP BU15-P16+A0+2D	<b>6ES7193-6BP20-0BA0</b> SIPLUS ET 200SP BU15-P16+A10+2B	<b>6ES7193-6BP20-0DA0</b> SIPLUS ET 200SP BU15-P16+A10+2D
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

### Technical specifications

Article number	6AG1193-6BP00-7BA0	6AG1193-6BP00-7DA0	6AG1193-6BP20-7BA0	6AG1193-6BP20-7DA0
Based on	6ES7193-6BP00-0BA0 SIPLUS ET 200SP BU15-P16+A0+2B	6ES7193-6BP00-0DA0 SIPLUS ET 200SP BU15-P16+A0+2D	6ES7193-6BP20-0BA0 SIPLUS ET 200SP BU15-P16+A10+2B	6ES7193-6BP20-0DA0 SIPLUS ET 200SP BU15-P16+A10+2D
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**SIPLUS BaseUnits****Technical specifications**

Article number	<b>6AG1193-6BP00-7BA1</b>	<b>6AG1193-6BP00-7DA1</b>	<b>6AG1193-6BP40-7BA1</b>	<b>6AG1193-6BP40-7DA1</b>
Based on	<b>6ES7193-6BP00-0BA1</b> SIPLUS ET 200SP BU15-P16+A0+2B/T	<b>6ES7193-6BP00-0DA1</b> SIPLUS ET 200SP BU15-P16+A0+2D/T	<b>6ES7193-6BP40-0BA1</b> SIPLUS ET 200SP BU15-P16+A0+12B/T	<b>6ES7193-6BP40-0DA1</b> SIPLUS ET 200SP BU15-P16+A0+12D/T
<b>General information</b>				
Product type designation	BU type A1	BU type A1	BU type A1	BU type A1
<b>Hardware configuration</b>				
<b>Slots</b>				
• Number of slots	1	1	1	1
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		

#### Technical specifications

Article number	6AG1193-6BP00-7BA1	6AG1193-6BP00-7DA1	6AG1193-6BP40-7BA1	6AG1193-6BP40-7DA1
Based on	6ES7193-6BP00-0BA1 SIPLUS ET 200SP BU15-P16+A0+2B/T	6ES7193-6BP00-0DA1 SIPLUS ET 200SP BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 SIPLUS ET 200SP BU15-P16+A0+12B/T	6ES7193-6BP40-0DA1 SIPLUS ET 200SP BU15-P16+A0+12D/T
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1193-6BP20-7BB0	6AG1193-6BP20-7BB1	6AG1193-6BP20-7DC0	6AG1193-6BP00-7BD0
Based on	6ES7193-6BP20-0BB0 SIPLUS ET 200SP BU20-P12+A4+0B	6ES7193-6BP20-0BB1 SIPLUS ET 200SP BU20-P12+A0+4B TYP B1	6ES7193-6BP20-0DC0 SIPLUS ET 200SP BU20-P6+A2+4D	6ES7193-6BP00-0BD0 SIPLUS ET 200SP BU20-P12+A0+0B
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C		-40 °C; = Tmin	-40 °C
• vertical installation, max.	50 °C		50 °C; = Tmax	50 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	3 000 m	3 000 m	3 000 m	3 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

## I/O systems

### SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

#### SIPLUS BaseUnits

#### Technical specifications

Article number	6AG1193-6BP20-7BB0	6AG1193-6BP20-7BB1	6AG1193-6BP20-7DC0	6AG1193-6BP00-7BD0
Based on	6ES7193-6BP20-0BB0 SIPLUS ET 200SP BU20-P12+A4+0B	6ES7193-6BP20-0BB1 SIPLUS ET 200SP BU20-P12+A0+4B TYP B1	6ES7193-6BP20-0DC0 SIPLUS ET 200SP BU20-P6+A2+4D	6ES7193-6BP00-0BD0 SIPLUS ET 200SP BU20-P12+A0+0B
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A



#### Technical specifications

Article number	6AG1193-6BP20-2BF0	6AG1193-6BP00-7BU0	6AG1193-6BP00-7DU0
Based on	6ES7193-6BP20-0BF0	6ES7193-6BP00-0BU0	6ES7193-6BP00-0DU0
	SIPLUS ET 200SP BU20-P8+A4+0B	SIPLUS ET 200SP BU20-P16+A0+2B	SIPLUS ET 200SP BU20-P16+A0+2D
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin		
• vertical installation, max.	50 °C; = Tmax		
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<b>Coolants and lubricants</b>			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**SIPLUS BaseUnits****Technical specifications**

Article number	<b>6AG1193-6BP20-2BF0</b>	<b>6AG1193-6BP00-7BU0</b>	<b>6AG1193-6BP00-7DU0</b>
Based on	<b>6ES7193-6BP20-0BF0</b>	<b>6ES7193-6BP00-0BU0</b>	<b>6ES7193-6BP00-0DU0</b>
	SIPLUS ET 200SP BU20-P8+A4+0B	SIPLUS ET 200SP BU20-P16+A0+2B	SIPLUS ET 200SP BU20-P16+A0+2D
<b>Usage in industrial process technology</b>			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

**Overview**

SIMATIC BusAdapter BA 2xFC for direct laying of the PROFINET cable via FastConnect connection



ET 200SP BusAdapter BA-Send for expansion of an ET 200SP station with ET 200AL modules



SIMATIC BusAdapter BA LC/RJ45 for use as a system-integrated media converter from copper (RJ45) to glass fiber (LC)

For SIMATIC ET 200SP, two types of BusAdapter (BA) are available for selection:

- ET 200SP BusAdapter "BA-Send"  
for expansion of an ET 200SP station with up to 16 modules from the ET 200AL I/O series with IP67 protection via an ET connection
- SIMATIC BusAdapter  
for the free selection of the connection system (pluggable or direct connection) and physical PROFINET connection (copper, POF, HCS or glass fiber) to devices with a SIMATIC BusAdapter interface.  
One further advantage of the SIMATIC BusAdapter: only the adapter needs to be replaced for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, or to repair defective RJ45 sockets.

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

### BusAdapters

Ordering data	Article No.	Article No.
<b>BA 2xRJ45 BusAdapter</b> For IM 155-6PN ST, HF	<b>6ES7193-6AR00-0AA0</b>	<b>BA 2XLC BusAdapter</b> For IM 155-6PN HF; 2 glass FO connections
<b>BA 2xFC BusAdapter</b> For IM 155-6PN ST, HF; for increased resistance to vibration and EMC loads	<b>6ES7193-6AF00-0AA0</b>	<b>BA LC/RJ45 BusAdapter</b> For IM 155-6PN HF; with media converter glass FO - copper; 1 x LC connection, 1 x RJ45 connection
<b>BusAdapter BA 2xM12</b> For IM 155-6PN ST, HF; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	<b>6ES7193-6AM00-0AA0</b>	<b>BA LC/FC BusAdapter</b> For IM 155-6PN HF; with media converter glass FO - copper; 1 x LC connection, 1 x FastConnect connection
<b>BA 2xSCRJ BusAdapter</b> For IM 155-6PN HF; fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	<b>6ES7193-6AP00-0AA0</b>	<b>Station expansion with IP67 I/O system ET 200AL</b>
<b>BA SCRJ/RJ45 BusAdapter</b> For IM 155-6PN HF; with media converter FOC-Cu; 1 x SCRJ FO connection, 1 x RJ45 connection	<b>6ES7193-6AP20-0AA0</b>	<b>ET 200SP BA-Send 1 x FC BusAdapter</b>
<b>BA SCRJ/FC BusAdapter</b> For IM 155-6PN HF; with media converter FOC-Cu; 1 x SCRJ FO connection, 1 x FastConnect connection	<b>6ES7193-6AP40-0AA0</b>	<b>BaseUnit BU-Send</b>
		<b>Accessories</b>
		<b>Equipment labeling plate</b>
		10 sheets of 16 labels, for printing with thermal transfer card printer or plotter

### Technical specifications

Article number	6ES7193-6AR00-0AA0	6ES7193-6AF00-0AA0	6ES7193-6AM00-0AA0	6ES7193-6AP00-0AA0	6ES7193-6AP20-0AA0
	ET 200SP, Busadapter BA 2xRJ45	ET 200SP, Busadapter BA 2xFC	SIMATIC Busadapter BA 2xM12	ET 200SP, Busadapter BA 2xSCRJ	ET 200SP, Busadapter BA SCRJ/RJ45
<b>General information</b>					
Product type designation	BA 2x RJ45	BA 2xFC	BA 2x M12 Bus- Adapter	BA 2xSCRJ	BA SCRJ/RJ45
<b>Interfaces</b>					
Number of PROFINET interfaces	1	1	1	1; 2 ports (switch) SCRJ FO	1; 2 ports (SCRJ + RJ45)
<b>Supports protocol for PROFINET IO</b>					
• Number of RJ45 ports	2				1
• Number of FC (FastConnect) connections		2			
• Number of SCRJ ports	0			2	1
• Number of LC ports	0			0	0
• Number of M12 ports			2		
<b>Cable length</b>					
- PCF				100 m	100 m
- Plastic FOC (POF)				50 m	50 m
- PCF-GI				250 m	250 m
- Cu conductors	100 m	100 m	100 m		100 m
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
<b>Dimensions</b>					
Width	20 mm	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	73.5 mm	69.5 mm	
Depth	59 mm	59 mm	59 mm	59 mm	
<b>Weights</b>					
Weight, approx.	46 g	53 g	59 g	50 g	50 g

#### Technical specifications

Article number	6ES7193-6AP40-0AA0	6ES7193-6AG00-0AA0	6ES7193-6AG20-0AA0	6ES7193-6AG40-0AA0
	ET 200SP, Bus adapter BA SCRJ/FC	SIMATIC Busadapter BA 2XLC	SIMATIC Busadapter BA LC/RJ45	SIMATIC Bus adapter BA LC/FC
<b>General information</b>				
Product type designation	BA SCRJ/FC	BA 2xLC	BA LC/RJ45	BA LC/FC
<b>Interfaces</b>				
Number of PROFINET interfaces	1; 2 ports (SCRJ + FC)	1; 2 ports (switch) LC Multimode Glass Fibre	1; 2 ports (switch) LC / RJ45	1
<b>Supports protocol for PROFINET IO</b>				
• Number of RJ45 ports			1	
• Number of FC (FastConnect) connections	1			1
• Number of SCRJ ports	1	0	0	0
• Number of LC ports	0	2; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX
<b>Cable length</b>				
- PCF	100 m			
- Plastic FOC (POF)	50 m			
- PCF-GI	250 m			
- Cu conductors	100 m		100 m	100 m
- Multimode graded-index fiber 50/125 µm		3 km	3 km	3 km
- Multimode graded-index fiber 62.5/125 µm		3 km	3 km	3 km
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
<b>Dimensions</b>				
Width	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm	59 mm
<b>Weights</b>				
Weight, approx.	50 g	40 g	32 g	50 g
<b>Article number</b>				
	6ES7193-6AS00-0AA0			
	ET 200SP, Busadapter BA-Send BA1XFC			
<b>General information</b>				
Product type designation	BA-Send 1xFC			
<b>Interfaces</b>				
<b>Supports protocol for PROFINET IO</b>				
<b>Cable length</b>				
- Cu conductors	15 m; from IM firmware V3.3: between BA-send and the first ET-CONNECTION bus node and between all other bus nodes			
<b>ET-Connection</b>				
• Number of interfaces ET connection	1			
• FC (FastConnect)	Yes			
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m			
<b>Dimensions</b>				
Width	20 mm			
<b>Weights</b>				
Weight, approx.	44 g			

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP

**SIPLUS BusAdapters****Overview**

ET 200SP BusAdapter (RJ45)



BA 2xFC BusAdapter

Some interface modules of the SIPLUS ET 200SP have a universal PROFINET interface for BusAdapters. With the appropriate bus adapter, the type of connection can be adapted to the requirements of the respective application:

- For standard applications with a moderate mechanical and EMC load, the BA 2xRJ45 BusAdapter is used. It offers two sockets for standard RJ45 plugs.
- For machines and systems in which higher mechanical and/or EMC loads act on the devices, the BA 2xFC BusAdapter is recommended. In this case, the bus cables are connected directly by means of FastConnect terminals – similar to the PROFIBUS connector, proven in millions of applications. The technology is extremely quick to assemble and achieves 5 times better vibration resistance and also 5 times greater resistance to electromagnetic interference, when compared to RJ45 plug connectors.
- BusAdapters with connections for fiber-optic cables can be used to cover high potential differences between two stations and/or high EMC loads.

Another advantage of the BusAdapters: In order to repair defective RJ45 sockets or for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, only the adapter needs to be replaced.

The following interface modules offer a PROFINET connection via BusAdapter:

- SIPLUS IM 155-6PN Standard
- SIPLUS IM 155-6PN High Feature

**Note**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.**

<b>SIPLUS BA 2xRJ45 BusAdapter</b> (Extended temperature range and exposure to environmental substances) for IM 155-6PN ST, HF	<b>6AG1193-6AR00-7AA0</b>
<b>SIPLUS BA 2xFC BusAdapter</b> (Extended temperature range and exposure to environmental substances) for IM 155-6PN ST, HF; for increased resistance to vibration and EMC loads	<b>6AG1193-6AF00-7AA0</b>
<b>SIPLUS BA 2xSCRJ BusAdapter</b> (Extended temperature range and exposure to environmental substances) for IM 155-6PN HF; fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	<b>6AG1193-6AP00-2AA0</b>

**Article No.**

<b>SIPLUS BA 2xLC BusAdapter</b> (Extended temperature range and exposure to environmental substances) For IM 155-6PN HF; 2 glass FO connections	<b>6AG1193-6AG00-2AA0</b>
<b>Equipment labeling plate</b> 10 sheets of 16 plates, for printing with thermal transfer card printer or plotter	<b>6ES7193-6LF30-0AW0</b>
<b>Accessories</b>	
<b>SIPLUS Mounting Kit ET 200SP</b> Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter BA 2xRJ45	<b>6AG1193-6AA00-0AA0</b>

### Technical specifications

Article number	<b>6AG1193-6AR00-7AA0</b>	<b>6AG1193-6AF00-7AA0</b>	<b>6AG1193-6AP00-2AA0</b>	<b>6AG1193-6AG00-2AA0</b>
Based on	<b>6ES7193-6AR00-0AA0</b> SIPLUS ET 200SP BA 2XRJ45	<b>6ES7193-6AF00-0AA0</b> SIPLUS ET 200SP BA 2XFC PN	<b>6ES7193-6AP00-0AA0</b> SIPLUS ET 200SP BA 2XSCRJ PN	<b>6ES7193-6AG00-0AA0</b> SIPLUS ET 200SP BA 2XLC
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

**SIPLUS BusAdapters****Technical specifications**

Article number	<b>6AG1193-6AR00-7AA0</b>	<b>6AG1193-6AF00-7AA0</b>	<b>6AG1193-6AP00-2AA0</b>	<b>6AG1193-6AG00-2AA0</b>
Based on	<b>6ES7193-6AR00-0AA0</b> SIPLUS ET 200SP BA 2XRJ45	<b>6ES7193-6AF00-0AA0</b> SIPLUS ET 200SP BA 2XFC PN	<b>6ES7193-6AP00-0AA0</b> SIPLUS ET 200SP BA 2XSCRJ PN	<b>6ES7193-6AG00-0AA0</b> SIPLUS ET 200SP BA 2XLC
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A



### Overview Labeling strips

The head-end stations and I/O modules can optionally be equipped with labeling strips (13 x 31 mm) for system-specific marking. The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow:

- 500 strips on the roll, for printing on thermal transfer printers. Core diameter 40 mm, external diameter 70 mm, width 62 mm
- 10 DIN A4 sheets with 100 strips each, 180 g/sm card, perforated, for printing using a laser printer direct from TIA Portal or via print templates

### Overview Equipment labeling plates



Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal-transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly:

- The inscription on the front is not covered
- Simple label replacement when replacing a module
- No parallax errors when marking the BaseUnits on the mounting plate

The size of the labels is 14.8 x 10.5 mm (W x H)

### Overview BU cover

The ET 200SP system can be operated with any number of slot gaps (BU slot without inserted I/O module). Applications for this include:

- Partial commissioning
- Prewired but unequipped options

To protect against damage, such slot gaps must be covered by a BU cover.

Within the BU cover, an equipment labeling plate for identification of the I/O module planned for this slot can be stored.

Versions:

- For BaseUnits with a width of 15 mm (pack containing 5 BU covers)
- For BaseUnits with a width of 20 mm (pack containing 5 BU covers)

### Overview Shield connection

The shield connection permits the low-cost connection of cable shields. Compared to external shield supports, the system offers the following advantages:

- Quick installation without tools by plugging the shield connection element onto the BaseUnit
- Automatic low-impedance connection to the functional ground (mounting rail)
- Optimized EMC properties by separating the signal lines from the voltage supply lines
- Short unshielded cable lengths
- Requires little space

### Overview Color-coded labels

The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the process terminals. The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals can also be marked using color-coded labels. Advantages of the color-coded labels:

- Quick installation (one label for marking 16 terminals)
- Printed terminal numbers
- Avoidance of wiring errors
- Simple detection of potentials during servicing

### Overview Server module

The server module is included in the scope of delivery of all head-end stations (interface module, CPU, Open Controller). It concludes the setup of an ET 200SP station.

### Overview SIPLUS server module

The SIPLUS server module is included in the scope of supply of all head-end stations (interface module, CPU, Open Controller). It concludes the setup of a SIPLUS ET 200SP station.

### Overview e-coding element

The operation of selected modules requires an electronic coding element that is always included in the scope of delivery of the I/O module. Apart from the mechanical coding function, this contains a re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules or parameter data in the case of the IO-Link master). In this way, this data is automatically backed up during a module replacement. This saves the user from having to set addresses manually or back up data when replacing modules.

At present, there are two types of electronic coding element:

- e-coding element (Type H), which can be used in the I/O modules:
  - CM IO-Link master
  - F-CM AS-i Safety
- e-coding element (Type F), which can be used in the I/O modules:
  - F-DI 8x24VDC HF
  - F-DQ 4x24VDC/2A PM HF
  - F-PM-E 24VDC/8A PPM ST

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP**Accessories****Ordering data****Article No.****Article No.****Labeling strips**

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AG0**

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

**6ES7193-6LA10-0AA0**

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

**6ES7193-6LA10-0AG0****Equipment labeling plates**

10 sheets of 16 plates

**6ES7193-6LF30-0AW0****BU cover**

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

**6ES7133-6CV15-1AM0****6ES7133-6CV20-1AM0****Shield connection**

5 shield supports and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground

**6ES7193-6SC00-1AM0****Module-specific color-coded labels**

(pack containing 10 labels)

Color code CC00, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)

**6ES7193-6CP00-2MA0**

Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)

**6ES7193-6CP01-2MA0**

Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16)

**6ES7193-6CP02-2MA0**

Color code CC03, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16)

**6ES7193-6CP03-2MA0**

Color code CC04, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16)

**6ES7193-6CP04-2MA0**

Color code CC05, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16)

**6ES7193-6CP05-2MA0**

Color code CC41, for 16 push-in terminals; for BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12)

**6ES7193-6CP41-2MB0**

Color code CC42, for 12 push-in terminals, BU type F0, gray (terminals 1 to 8), red (terminals 9 to 10), blue (terminals 11 to 12)

**6ES7193-6CP42-2MB0****Module-specific color-coded labels (continued)**

Color code CC51, for 6 push-in terminals, for BU type C0, C1, gray (terminals 1 to 4), red (terminal 5), blue (terminal 6)

**6ES7193-6CP51-2MC0**

Color code CC51, for 6 push-in terminals, for BU type C0, gray (terminals 1, 2 and 5), red (terminals 3 and 4), blue (terminal 6)

**6ES7193-6CP52-2MC0**

(pack containing 50 labels)

Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)

**6ES7193-6CP01-4MA0**

Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16)

**6ES7193-6CP02-4MA0****Color-coded labels for additional terminals**

(pack containing 10 labels)

Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A)

**6ES7193-6CP71-2AA0**

Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A)

**6ES7193-6CP72-2AA0**

Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A)

**6ES7193-6CP73-2AA0**

Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C)

**6ES7193-6CP74-2AA0**

Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A)

**6ES7193-6CP81-2AB0**

Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A)

**6ES7193-6CP82-2AB0**

Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A)

**6ES7193-6CP83-2AB0**

Color code CC84, for 2 AUX terminals, BU type C0, C1, yellow/green (terminals 1 A to 2 A)

**6ES7193-6CP84-2AC0**

Color code CC85, for 2 AUX terminals, for BU type C0, C1, red (terminals 1 A to 2 A)

**6ES7193-6CP85-2AC0**

Color code CC86, for 2 AUX terminals, for BU type C0, C1, blue (terminals 1 A to 2 A)

**6ES7193-6CP86-2AC0****Server module**

Spare part

**6ES7193-6PA00-0AA0****SIPLUS server module**

(Extended temperature range and exposure to environmental substances)

**6AG1193-6PA00-7AA0**

Spare part

**e-coding element**

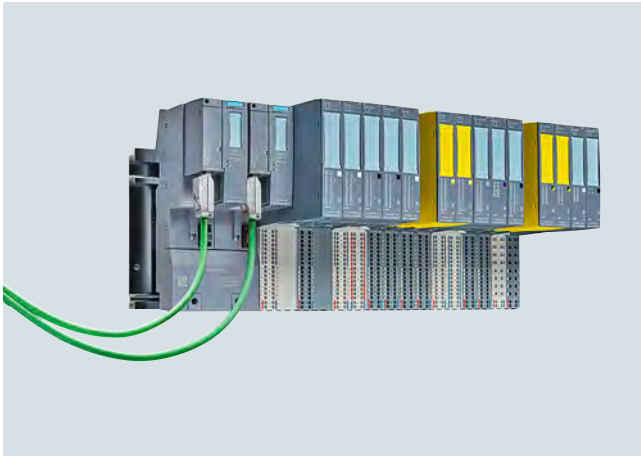
Type H; pack containing 5 e-coding elements

**6ES7193-6EH00-1AA0**

Type F; pack containing 5 e-coding elements

**6ES7193-6EF00-1AA0**

## Overview



SIMATIC ET 200SP HA F IO Redundant Station 2PN

Compact design, flexible connection possibilities and high system availability with redundant PROFINET connections: the SIMATIC ET 200SP HA distributed I/O system is perfectly suited to the requirements of the process industry. The new design allows up to 56 I/O modules per station. An impressively high concentration of up to 32 channels on a module that is only 22.5 mm wide allows for maximum economy in the control cabinet.

Redundant PROFINET connections allow the connection of high-availability controllers via two independent networks, with a choice of copper or fiber-optic cables. The system can be scaled and extended in small steps using a variety of available modules, for example with digital and analog I/Os as well as NAMUR, HART, and other protocols. All 24 V standard signals are connected via an identical terminal block type, which allows a high degree of standardization for the control cabinets.

SIMATIC ET 200SP HA is designed for use in the control cabinet as well as for hazardous areas up to Ex zone 2. The extended temperature range from -40 to +70 °C and the conformal coating of all components allow direct installation in the field.

You also benefit in engineering from seamless integration in SIMATIC PCS 7. The SIMATIC ET 200SP HA in combination with the Advanced Process Library also offers flexible and simple online parameter assignment and selection of up to four HART variables per channel.

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

**Interface module****Overview**

IM 155-6 PN HA

**IM 155-6 PN HA interface module**

The IM 155-6 PN HA together with the IM carrier module and the BusAdapter forms the interface of the ET 200SP HA. The interface is used for communication between the CPU and the connected ET 200SP HA I/O modules over PROFINET.

**Ordering data****Article No.****Interface module**

**PROFINET IM 155-6 PN interface module**  
Max. 56 I/O modules,  
multi hot swap, no server module

**6DL1155-6AU00-0PM0****Accessories**

**IM cover**  
Slot cover for interface module  
slots, to protect vacant slots  
Width 50 mm, 5 units

**6DL1133-6CV50-0AM0**

#### Technical specifications

Article number	<b>6DL1155-6AU00-0PM0</b> ET 200SP HA, IM155-6 PN
<b>General information</b>	
Product type designation	IM 155-6 PN
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V16
• PCS 7 configurable/integrated from version	V9.0
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
<b>Address area</b>	
<b>Address space per station</b>	
• Address space per station, max.	1 440 byte; 1 440 bytes R1 and S1 without CiR, otherwise 1 000 bytes
<b>Hardware configuration</b>	
Integrated power supply	Yes; 24 V DC
<b>Rack</b>	
• Modules per rack, max.	56; 56 slots for I/O modules + server module (width without IM ≤ 1.3 m)
<b>Time stamping</b>	
Accuracy	1 ms; In compliance with the supplementary conditions described in the Equipment Manual
<b>Interfaces</b>	
Number of PROFINET interfaces	1; 2 ports (switch)
<b>1. Interface</b>	
<b>Interface types</b>	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA VD
<b>Protocols</b>	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; as MRP client

Article number	<b>6DL1155-6AU00-0PM0</b> ET 200SP HA, IM155-6 PN
<b>Interface types</b>	
<b>RJ 45 (Ethernet)</b>	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
<b>Redundancy mode</b>	
• PROFINET system redundancy (S2)	Yes; S2, R1
<b>Media redundancy</b>	
- MRP	Yes
<b>Open IE communication</b>	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• ACT LED	Yes; green LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
<b>Dimensions</b>	
Width	50 mm
Height	138 mm
Depth	89 mm
<b>Weights</b>	
Weight, approx.	192 g; without BusAdapter

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

### Digital I/O modules

#### Overview



- DI 16×24VDC HA digital input module  
16 24 V DC digital inputs
- DI 32×24VDC HA digital input module  
32 24 V DC digital inputs
- DI 16×NAMUR HA digital input module  
16 NAMUR digital inputs
- DI 8×24...125VDC HA digital input module  
8 24 ... 125 V DC digital inputs
- DI 8×230VAC HA digital input module  
8 230 V AC digital inputs
- DQ 16×24VDC/0.5A HA digital output module  
16 24 V DC digital outputs, 0.5 A
- DQ 32×24VDC/0.5A HA digital output module  
32 24 V DC digital outputs, 0.5 A
- RQ 4×120VDC-230VAC/5A CO HA digital output module  
4 24 ... 120 V DC, 24 ... 230 V AC relay outputs, 5 A

#### Ordering data

#### Article No.

<b>DI 16×24VDC HA digital input module</b> 16 24 V DC digital inputs, color code CC01, for terminal block type H1 and M1, channel diagnostics	<b>6DL1131-6BH00-0PH1</b>
<b>DI 32×24VDC HA digital input module</b> 32 24 V DC digital inputs, color code CC00, for terminal block type P0 and H1, channel diagnostics	<b>6DL1131-6BL00-0PH1</b>
<b>DI 16×NAMUR HA digital input module</b> 16 NAMUR digital inputs, color code CC01, for terminal block type H1 and M1, channel diagnostics	<b>6DL1131-6TH00-0PH1</b>
<b>DI 8×24...125VDC HA digital input module</b> 8 24 ... 125 V DC digital inputs, color code CC42, f or terminal block type K0, channel diagnostics	<b>6DL1131-6DF00-0PK0</b>
<b>DI 8×230VAC HA digital input module</b> 8 230 V AC digital inputs, color code CC42, for terminal block type K0, module diagnostics	<b>6DL1131-6GF00-0PK0</b>
<b>DQ 16×24VDC/0.5A HA digital output module</b> 16 24 V DC digital outputs, 0.5 A, color code CC02, for terminal block type H1 and M1, channel diagnostics	<b>6DL1132-6BH00-0PH1</b>
<b>DQ 32×24VDC/0.5A HA digital output module</b> 32 24 V DC digital outputs, 0.5 A, color code CC00, for terminal block type N0 and H1, channel diagnostics	<b>6DL1132-6BL00-0PH1</b>
<b>RQ 4×120VDC-230VAC/5A CO HA digital output module</b> 4 24 ... 120 V DC, 24 ... 230 V AC relay outputs, 5 A, color code CC40, for terminal block type K0, module diagnostics	<b>6DL1132-6HD50-0PK0</b>

#### Article No.

<b>Accessories</b>	
<b>Labeling strips</b> For labeling the I/O modules	
• Roll, light gray (with a total of 500 labeling strips), 1 unit	<b>6DL1193-6LR00-0AA0</b>
• DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)	<b>6DL1193-6LA00-0AA0</b>
• DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)	<b>6DL1193-6LA00-0AG0</b>
<b>Color-coded labels</b> For push-in terminals	
• Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)	<b>6DL1193-6CP01-2HH1</b>
• Color code CC02, 10 units gray (terminals 1 to 16), blue (terminals 17 to 32)	<b>6DL1193-6CP02-2HH1</b>
• Color code CC40, 10 units gray (terminals 1 to 16)	<b>6DL1193-6CP40-2HK0</b>
• Color code CC42, 10 units gray (terminals 1 to 8), blue (terminals 9 to 16)	<b>6DL1193-6CP42-2HK0</b>
<b>Equipment labeling plates</b> 10 sheets with 16 labels each	<b>6ES7193-6LF30-0AW0</b>
<b>TM cover</b> Slot cover for I/O modules, to protect vacant I/O slots Width 22.5 mm, 5 units	<b>6DL1133-6CV22-0AM0</b>

#### Technical specifications

Article number	6DL1131-6GF00-0PK0 ET 200SP HA, DI 8x230VAC	6DL1131-6BH00-0PH1 ET 200SP HA, DI 16x24VDC	6DL1131-6BL00-0PH1 ET 200SP HA, DI 32x24VDC	6DL1131-6DF00-0PK0 ET 200SP HA, DI 8x24 ... 125VDC	6DL1131-6TH00-0PH1 ET 200SP HA, DI 16xNAMUR
<b>General information</b>					
Product type designation	DI 8x230VAC HA	DI 16x24VDC HA	DI 32x24VDC HA	DI 8x24 ... 125 V DC HA	DI 16xNAMUR HA
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/ integrated from version	V16	V16	V16	V16	V16
• PCS 7 configurable/integrated from version	V9.0	V9.0	V9.0	V9.0	V9.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
<b>Operating mode</b>					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter		No	No	No	No
• Oversampling		No	No	No	No
• MSI		No	No	No	No
<b>Supply voltage</b>					
Rated value (DC)		24 V	24 V	24 V	24 V
Rated value (AC)	230 V				
Reverse polarity protection		Yes	Yes	Yes	Yes
<b>Encoder supply</b>					
Number of outputs		16	32; When terminal block with encoder supply is used (type P0)		16
Short-circuit protection		Yes; electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable	Yes; When using TB type P0		Yes
<b>Output current</b>					
• up to 60 °C, max.		2 A; 1 A when mounted vertically; see derating information in Equipment Manual			
• up to 70 °C, max.		1 A; See derating information in Equipment Manual			

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**Digital I/O modules****Technical specifications**

Article number	<b>6DL1131-6GF00-0PK0</b>	<b>6DL1131-6BH00-0PH1</b>	<b>6DL1131-6BL00-0PH1</b>	<b>6DL1131-6DF00-0PK0</b>	<b>6DL1131-6TH00-0PH1</b>
	ET 200SP HA, DI 8X230VAC	ET 200SP HA, DI 16X24VDC	ET 200SP HA, DI 32X24VDC	ET 200SP HA, DI 8X24 ... 125VDC	ET 200SP HA, DI 16XNAMUR
<b>24 V encoder supply</b>					
<ul style="list-style-type: none"> <li>• 24 V</li> <li>• Short-circuit protection</li> </ul>		Yes			
<ul style="list-style-type: none"> <li>• Output current per channel, max.</li> <li>• Output current per module, max.</li> </ul>		Yes; electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable			
		0.5 A			
		2 A			
<b>Digital inputs</b>					
Number of digital inputs	8; Isolated	16	32	8	16; NAMUR
Digital inputs, parameterizable		Yes	Yes		Yes
Source/sink input		Yes; P-reading	Yes; P-reading	Yes; P-reading	
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	Yes	
Input characteristic curve in accordance with IEC 61131, type 2		No	No		
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	Yes	
Pulse extension		Yes	No		Yes; 0.5 s, 1 s, 2 s
<ul style="list-style-type: none"> <li>• Length</li> </ul>		off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Time stamping		Yes; Resolution 10 ms		Yes; Resolution 10 ms	Yes
Time stamp (with precision of 1 ms)		Yes; Resolution 1ms		Yes; Resolution 1ms	No
Edge evaluation		Yes; rising edge, falling edge, edge change	Yes; rising edge, falling edge, edge change		Yes; rising edge, falling edge, edge change
Signal change flutter					Yes; 2 to 32 signal changes
Flutter observation window					Yes; 0.5 s, 1 s to 100 s in 1-s steps
<b>Input voltage</b>					
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> <li>• Rated value (AC)</li> <li>• for signal "0"</li> <li>• for signal "1"</li> </ul>		24 V	24 V		8.2 V
	230 V				
	0V AC to 40V AC	-30 to +5 V	-30 to +5 V	-125 ... +5 V	
	74 V AC to 264 V AC	+11 to +30V	+11 to +30V	+11 ... +125 V	
<b>Input current</b>					
<ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>	10.8 mA	2.5 mA	2.5 mA	3.1 mA	
<b>for 10 k switched contact</b>					
- for signal "0"					0.35 to 1.2 mA
- for signal "1"					2.1 ... 6.4 mA
<b>for unswitched contact</b>					
- for signal "0", max. (permissible quiescent current)					0.5 mA
- for signal "1"					typ. 8 mA
<b>for NAMUR encoders</b>					
- for signal "0"					0.35 to 1.2 mA
- for signal "1"					2.1 ... 6.4 mA
<b>Input delay (for rated value of input voltage)</b>					
<ul style="list-style-type: none"> <li>• tolerated changeover time for changeover contacts</li> </ul>					300 ms



#### Technical specifications

Article number	6DL1131-6GF00-0PK0	6DL1131-6BH00-0PH1	6DL1131-6BL00-0PH1	6DL1131-6DF00-0PK0	6DL1131-6TH00-0PH1
	ET 200SP HA, DI 8X230VAC	ET 200SP HA, DI 16X24VDC	ET 200SP HA, DI 32X24VDC	ET 200SP HA, DI 8X24 ... 125VDC	ET 200SP HA, DI 16XNAMUR
<b>for standard inputs</b>					
- parameterizable		Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	
<b>Encoder</b>					
<b>Connectable encoders</b>					
• NAMUR encoder/changeover contact according to EN 60947					Yes
• Single contact / changeover contact unconnected					Yes
• Single contact / changeover contact connected with 10 kΩ					Yes
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes; Acc. to NAMUR
- permissible quiescent current (2-wire sensor), max.		1.5 mA	1.5 mA	1.5 mA	1.2 mA
<b>Interrupts/diagnostics/status information</b>					
Diagnostics function		Yes	Yes		
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes; channel by channel	Yes; channel by channel	Yes	Yes; channel by channel
• Hardware interrupt		Yes; channel by channel	Yes; channel by channel	Yes; Parameterizable, channels 0 to 7, rising/falling edge	Yes; Parameterizable, channels 0 to 15, rising/falling edge
<b>Diagnoses</b>					
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage		Yes; Module-wise	Yes; Module-wise	Yes	Yes
- parameterizable		Yes	Yes		Yes
• Monitoring of encoder power supply		Yes	Yes		Yes
• Wire-break		Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kOhm to 18 kOhm	Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kOhm to 18 kOhm	Yes; channel by channel	Yes
• Short-circuit			No		Yes
• Short-circuit to M		Yes; Encoder supply to M, channel by channel			
• Group error				Yes	Yes
• Changeover contact error					Yes
<b>Diagnostics indication LED</b>					
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)		Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics		Yes; red LED	No	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>					
<b>Potential separation channels</b>					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**Digital I/O modules****Technical specifications**

Article number	<b>6DL1131-6GF00-0PK0</b> ET 200SP HA, DI 8X230VAC	<b>6DL1131-6BH00-0PH1</b> ET 200SP HA, DI 16X24VDC	<b>6DL1131-6BL00-0PH1</b> ET 200SP HA, DI 32X24VDC	<b>6DL1131-6DF00-0PK0</b> ET 200SP HA, DI 8X24 ... 125VDC	<b>6DL1131-6TH00-0PH1</b> ET 200SP HA, DI 16XNAMUR
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
<b>Dimensions</b>					
Width	22.5 mm	22.5 mm	22.5 mm	22.5 mm	22.5 mm
Height	115 mm	115 mm	115 mm	115 mm	115 mm
Depth	138 mm	138 mm	138 mm	138 mm	138 mm
<b>Weights</b>					
Weight, approx.	148 g	135 g	150 g	165 g	153 g
Article number	<b>6DL1132-6BH00-0PH1</b> ET 200SP HA, DQ 16X24VDC/0,5A		<b>6DL1132-6BL00-0PH1</b> ET 200SP HA, DQ 32X24VDC/0,5A		<b>6DL1132-6HD50-0PK0</b> ET 200SP HA, RQ 4X120VDC-230VAC/5A CO
<b>General information</b>					
Product type designation	DQ 16x24VDC/0.5A HA		DQ 32x24VDC/0.5A HA		RQ 4x120 V UC ... 230 V AC/5 A CO HA
<b>Engineering with</b>					
• STEP 7 TIA Portal configurable/ integrated from version	V16		V16		V16
• PCS 7 configurable/integrated from version	V9.0		V9.0		V9.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3		GSDML V2.3		GSDML V2.3
<b>Operating mode</b>					
• DQ	Yes		Yes		
• DQ with energy-saving function	No		No		
• PWM	No		No		
• Oversampling	No		No		
• MSO	No				
<b>Supply voltage</b>					
Rated value (DC)	24 V		24 V		24 V
Reverse polarity protection	Yes		Yes		Yes
<b>Digital outputs</b>					
Number of digital outputs	16		32		4
Current-sinking	No		No		
Current-sourcing	Yes		Yes		
Digital outputs, parameterizable	Yes		Yes		
Short-circuit protection	Yes; Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable.		Yes; Clocked electronically		
Open-circuit detection	Yes; 0.7 mA test current for wire-break diagnostics; this value is doubled in the case of IO redundancy		No		
Overload protection	Yes		Yes		
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)		Typ. L+ (-53 V)		
Controlling a digital input	Yes		Yes		
<b>Switching capacity of the outputs</b>					
• with resistive load, max.	0.5 A		0.5 A		
• on lamp load, max.	5 W		5 W		

**Technical specifications**

Article number	<b>6DL1132-6BH00-0PH1</b> ET 200SP HA, DQ 16X24VDC/0,5A	<b>6DL1132-6BL00-0PH1</b> ET 200SP HA, DQ 32X24VDC/0,5A	<b>6DL1132-6HD50-0PK0</b> ET 200SP HA, RQ 4X120VDC-230VAC/5A CO
<b>Load resistance range</b>			
• lower limit	48 Ω	48 Ω	
• upper limit	12 kΩ	4 kΩ	
<b>Output current</b>			
• for signal "1" rated value	0.5 A	0.5 A	
• for signal "0" residual current, max.	0.7 mA; Test current for wire-break diagnostics; this value is doubled in the case of IO redundancy	0.1 mA	
<b>Output delay with resistive load</b>			
• "0" to "1", typ.	50 μs	54 μs	
• "1" to "0", typ.	100 μs	48 μs	
<b>Parallel switching of two outputs</b>			
• for uprating	No	No	
• for redundant control of a load	Yes	Yes; only outputs of the same group	
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	2 Hz
• with inductive load, max.	2 Hz	2 Hz	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	2 Hz
<b>Total current of the outputs</b>			
• Current per channel, max.	0.5 A	0.5 A	
• Current per module, max.	8 A	10 A	
<b>Total current of the outputs (per module)</b>			
<b>horizontal installation</b>			
- up to 30 °C, max.	8 A		
- up to 40 °C, max.	8 A		
- up to 50 °C, max.	8 A		
- up to 60 °C, max.	5.5 A		
- up to 70 °C, max.	3 A	10 A	
<b>vertical installation</b>			
- up to 30 °C, max.	8 A		
- up to 40 °C, max.	6.33 A		
- up to 50 °C, max.	4.67 A		
- up to 60 °C, max.	3 A	10 A	
<b>Relay outputs</b>			
• Number of relay outputs			4
• external protection for relay outputs			yes; 6 A, see data in manual
<b>Switching capacity of contacts</b>			
- with inductive load, max.			2 A; 2 A (24 V DC), 0.5 A (60 V DC), 0.1 A (120 V DC)
- with resistive load, max.			5 A; 5 A (30 V DC), 5 A (230 V AC)
- Switching current, min.			8 mA
- Rated switching voltage (DC)			24 V; 24 V DC to 120 V DC
- Rated switching voltage (AC)			230 V; 24V AC to 230V AC
<b>Cable length</b>			
• shielded, max.	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	200 m

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**Digital I/O modules****Technical specifications**

Article number	<b>6DL1132-6BH00-0PH1</b> ET 200SP HA, DQ 16X24VDC/0,5A	<b>6DL1132-6BL00-0PH1</b> ET 200SP HA, DQ 32X24VDC/0,5A	<b>6DL1132-6HD50-0PK0</b> ET 200SP HA, RQ 4X120VDC-230VAC/5A CO
<b>Interrupts/diagnostics/ status information</b>			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnoses</b>			
• Monitoring the supply voltage - parameterizable	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	No	Yes
• Short-circuit		Yes	
• Short-circuit to M	Yes; channel by channel	Yes; channel by channel	
• Short-circuit to L+	Yes; channel by channel	No	
• Group error	Yes	Yes	
<b>Diagnostics indication LED</b>			
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	No	
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>			
<b>Potential separation channels</b>			
• between the channels and backplane bus	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-40 °C	-40 °C	-40 °C; No icing
• horizontal installation, max.	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C; No icing
• vertical installation, max.	60 °C	60 °C	60 °C
<b>Altitude during operation relating to sea level</b>			
• Ambient air temperature- barometric pressure-altitude			3 000 m due to converter type used
<b>Dimensions</b>			
Width	22.5 mm	22.5 mm	22.5 mm
Height	115 mm	115 mm	115 mm
Depth	138 mm	138 mm	138 mm
<b>Weights</b>			
Weight, approx.	137 g	150 g	162 g

## Overview



- AI 16xI 2-wire HART HA analog input module  
16 analog inputs  
Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA, 4 to 20 mA with HART
- AI 16xTC/8xRTD 2-/3-/4-wire HA analog input module  
16 analog inputs for thermocouples;  
alternatively 8 analog inputs for thermistors
- AQ 8xI HART HA analog output module  
8 analog outputs  
Power output in the output ranges 0 to 10 mA, 0 to 20 mA, 4 to 20 mA and 4 to 20 mA HART

## Ordering data

Ordering data	Article No.
<b>AI 16xI 2-wire HART HA analog input module</b> 16 analog inputs Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA, 4 to 20 mA with HART Color code CC01, for terminal block type H1 and M1, channel diagnostics, 16-bit	6DL1134-6TH00-0PH1
<b>AI 16xTC/8xRTD 2-/3-/4-wire HA analog input module</b> 16 analog inputs for thermocouples; alternatively 8 analog inputs for thermistors Color code CC00, for terminal block type H1 and M1, channel diagnostics, 16-bit	6DL1134-6JH00-0PH1
<b>AQ 8xI HART HA analog output module</b> 8 analog outputs Power output in the output ranges 0 to 10 mA, 0 to 20 mA, 4 to 20 mA and 4 to 20 mA HART Color code CC00, for terminal block type H1 and M1, channel diagnostics, 16-bit	6DL1135-6TF00-0PH1

## Article No.

Accessories	Article No.
<b>Labeling strips</b> For labeling the I/O modules <ul style="list-style-type: none"> <li>• Roll, light gray (with a total of 500 labeling strips), 1 unit</li> </ul>	6DL1193-6LR00-0AA0
<ul style="list-style-type: none"> <li>• DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)</li> </ul>	6DL1193-6LA00-0AA0
<ul style="list-style-type: none"> <li>• DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)</li> </ul>	6DL1193-6LA00-0AG0
<b>Color-coded labels</b> For push-in terminals <ul style="list-style-type: none"> <li>• Color code CC00, 10 units gray (terminals 1 to 32)</li> </ul>	6DL1193-6CP00-2HH1
<ul style="list-style-type: none"> <li>• Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)</li> </ul>	6DL1193-6CP01-2HH1
<b>Equipment labeling plates</b> 10 sheets with 16 labels each	6ES7193-6LF30-0AW0
<b>TM cover</b> Slot cover for I/O modules, to protect vacant I/O slots Width 22.5 mm, 5 units	6DL1133-6CV22-0AM0

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**Analog I/O modules****Technical specifications**

Article number	<b>6DL1134-6JH00-0PH1</b> ET 200SP HA, AI 16XTC/8XRTD 2-/3-/4-WIRE	<b>6DL1134-6TH00-0PH1</b> ET 200SP HA, AI 16XI 2-WIRE HART
<b>General information</b>		
Product type designation	AI 16 x TC/8 x RTD 2/3/4-wire HA	AI 16 x I 2-wire mA HART
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	V16	V16
• PCS 7 configurable/integrated from version	V9.0	V9.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
<b>Analog inputs</b>		
Number of analog inputs		16
• For voltage measurement	16	
• For resistance/resistance thermometer measurement	8	
• For thermocouple measurement	16	
permissible input voltage for voltage input (destruction limit), max.	5 V	
permissible input current for current input (destruction limit), max.		30 mA
Constant measurement current for resistance-type transmitter, typ.	2 mA	
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	
<b>Input ranges (rated values), voltages</b>		
• -1 V to +1 V	Yes; 16 bit incl. sign	
• -250 mV to +250 mV	Yes; 16 bit incl. sign	
• -50 mV to +50 mV	Yes; 16 bit incl. sign	
• -80 mV to +80 mV	Yes; 16 bit incl. sign	
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA		Yes; 16 bit incl. sign
• 4 mA to 20 mA		Yes; 16 bit incl. sign
<b>Input ranges (rated values), thermocouples</b>		
• Type B	Yes; 16 bit incl. sign	
• Type C	Yes; 16 bit incl. sign	
• Type E	Yes; 16 bit incl. sign	
• Type J	Yes; 16 bit incl. sign	
• Type K	Yes; 16 bit incl. sign	
• Type L	Yes; 16 bit incl. sign	
• Type N	Yes; 16 bit incl. sign	
• Type R	Yes; 16 bit incl. sign	
• Type S	Yes; 16 bit incl. sign	
• Type T	Yes; 16 bit incl. sign	
• Type U	Yes; 16 bit incl. sign	
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign	

**Technical specifications**

Article number	<b>6DL1134-6JH00-0PH1</b> ET 200SP HA, AI 16XTC/8XRTD 2-/3-/4-WIRE	<b>6DL1134-6TH00-0PH1</b> ET 200SP HA, AI 16XI 2-WIRE HART
<b>Input ranges (rated values), resistance thermometer</b>		
• Cu 10	Yes; 16 bit incl. sign	
• Ni 100	Yes; 16 bit incl. sign	
• Ni 1000	Yes; 16 bit incl. sign	
• LG-Ni 1000	Yes; 16 bit incl. sign	
• Ni 120	Yes; 16 bit incl. sign	
• Ni 200	Yes; 16 bit incl. sign	
• Ni 500	Yes; 16 bit incl. sign	
• Pt 100	Yes; 16 bit incl. sign	
• Pt 1000	Yes; 16 bit incl. sign	
• Pt 200	Yes; 16 bit incl. sign	
• Pt 500	Yes; 16 bit incl. sign	
<b>Input ranges (rated values), resistors</b>		
• 0 to 150 ohms	Yes; 15 bit	
• 0 to 300 ohms	Yes; 15 bit	
• 0 to 600 ohms	Yes; 15 bit	
• 0 to 3000 ohms	Yes; 15 bit	
• 0 to 6000 ohms	Yes; 15 bit	
• PTC	Yes; 15 bit	
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- parameterizable	Yes	
<b>Cable length</b>		
• shielded, max.	200 m; Measurement ranges for thermocouples / voltages: shielded cable length max. 600 m, loop resistance max 8 kOhm; measuring ranges RTD: shielded cable length max. 600 m, cable resistance (single) max. 75 ohms	800 m; with unshielded cables up to 800 m, remember that (external) EMC loads can cause incorrect measured values
<b>Analog value generation for the inputs</b>		
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit; 15 bit at 0 ... 10 mA and 60 Hz interference suppression
• Integration time, parameterizable	Yes; Channel-by-channel, results from the selected interference frequency suppression	Yes; channel by channel
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz, channel-by-channel	
• Conversion time (per channel)	60 ms; 180 / 50 ms, results from the selected interference frequency suppression	
<b>Smoothing of measured values</b>		
• parameterizable	Yes; none, weak, medium, strong, channel-by-channel	Yes; none, weak, medium, strong, channel-by-channel
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for current measurement as 2-wire transducer		Yes
<b>Errors/accuracies</b>		
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input range, (+/-)	0.05 %	
• Current, relative to input range, (+/-)		0.1 %
• Resistance, relative to input range, (+/-)	0.05 %	
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	
• Common mode voltage, max.	60 V	
• Common mode interference, min.	90 dB	

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

**Analog I/O modules****Technical specifications**

Article number	<b>6DL1134-6JH00-0PH1</b> ET 200SP HA, AI 16XTC/8XRTD 2-/3-/4-WIRE	<b>6DL1134-6TH00-0PH1</b> ET 200SP HA, AI 16XI 2-WIRE HART
<b>Interrupts/diagnostics/ status information</b>		
Diagnostics function	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel
• Short-circuit		Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel
<b>Diagnostics indication LED</b>		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C; Observe derating
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C; Observe derating
<b>Dimensions</b>		
Width	22.5 mm	22.5 mm
Height	115 mm	115 mm
Depth	138 mm	138 mm
<b>Weights</b>		
Weight, approx.	150 g	148 g



#### Technical specifications

Article number	<b>6DL1135-6TF00-0PH1</b> ET 200SP HA, AQ 8XI HART
<b>General information</b>	
Product type designation	AQ 8 x I HART HA
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V16
• PCS 7 configurable/integrated from version	V9.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Analog outputs</b>	
Number of analog outputs	8; short-circuit proof with respect to ground
<b>Output ranges, current</b>	
• 0 to 10 mA	Yes; 14 bit
• 0 to 20 mA	Yes; 15 bit
• -20 mA to +20 mA	No
• 4 mA to 20 mA	Yes; 16 bit incl. sign
<b>Connection of actuators</b>	
• for current output two-wire connection	Yes
<b>Load impedance (in rated range of output)</b>	
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
<b>Cable length</b>	
• shielded, max.	1 000 m; with unshielded cables up to 800 m, remember that (external) EMC loads can cause incorrect measured values
<b>Settling time</b>	
• for resistive load	1.2 ms; 750 ohm
• for inductive load	1.2 ms

Article number	<b>6DL1135-6TF00-0PH1</b> ET 200SP HA, AQ 8XI HART
<b>Errors/accuracies</b>	
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to output range, (+/-)	0.1 %
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
• Overflow/underflow	Yes; channel by channel
<b>Diagnostics indication LED</b>	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
<b>Dimensions</b>	
Width	22.5 mm
Height	115 mm
Depth	138 mm
<b>Weights</b>	
Weight, approx.	160 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

### Analog/digital module

#### Overview



The I/O module AI-DI 16/DQ 16x24VDC HART HA is available in the following versions:

- DI 16/DQ 16x24VDC HA in digital-only mode
- AI-DI 16/DQ 16x24VDC HART HA as digital/analog module in mixed mode

Time stamping is available with configuration in mixed mode. High-precision time stamping (SoE: Sequence of Events) with a precision of 1 ms is available with configuration in digital-only mode.

In mixed mode, the 16 inputs can also be set channel by channel as either digital inputs or analog inputs with or without HART. HART is only available in mixed mode and with configuration in a measuring range of 4 to 20 mA.

#### Ordering data

#### Article No.

##### AI-DI 16/DQ 16x24VDC HART HA input/output module

16 channels, each with digital output and digital/analog input  
Color code CC01,  
for terminal block type H1 and M1

6DL1133-6EW00-0PH1

##### Accessories

##### Labeling strips

For labeling the I/O modules

- Roll, light gray (with a total of 500 labeling strips), 1 unit
- DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)
- DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)

6DL1193-6LR00-0AA0

6DL1193-6LA00-0AA0

6DL1193-6LA00-0AG0

##### Color-coded labels

For push-in terminals

- Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)

6DL1193-6CP01-2HH1

##### Equipment labeling plates

10 sheets with 16 labels each

6ES7193-6LF30-0AW0

##### Slot cover for I/O modules

22.5 mm wide

6DL1133-6CV22-0AM0

10

#### Technical specifications

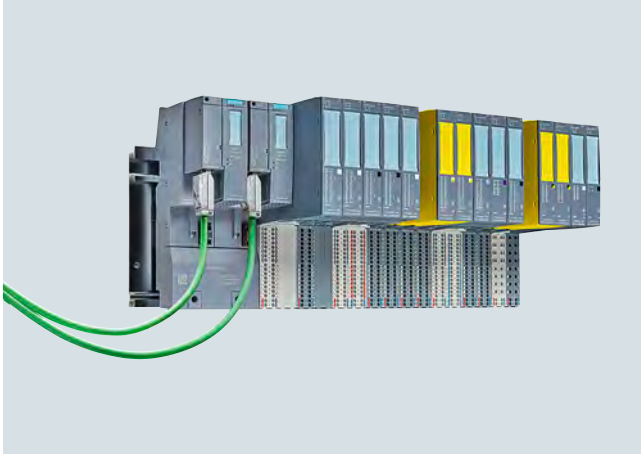
Article number	<b>6DL1133-6EW00-0PH1</b> ET 200SP HA, AI-DI16/DQ16X24VDC HART
<b>General information</b>	
Product type designation	AI-DI 16/DQ 16x24VDC HART HA
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V16
• STEP 7 configurable/integrated from version	V5.6
• PCS 7 configurable/integrated from version	V9.0
• PCS neo can be configured/ integrated from version	V3.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3
<b>Operating mode</b>	
• DI	Yes
• Counter	Yes
• DQ	Yes
• DQ with energy-saving function	No
• PWM	No
• Oversampling	No
• MSI	No
• MSO	No
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	16
Short-circuit protection	Yes; per channel, electronic
<b>Digital inputs</b>	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Pulse extension	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Time stamping	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	Yes; Resolution 1ms
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes; Partner channel of n+8 counter
• Freely usable digital input	Yes; Parameterizable input filter
• Counter	Yes; Incl. frequency measurement
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)

Article number	<b>6DL1133-6EW00-0PH1</b> ET 200SP HA, AI-DI16/DQ16X24VDC HART
<b>Digital outputs</b>	
Number of digital outputs	16
Current-sinking	No
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; Response threshold 0.7 A to 1.3 A
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	L+ (-37 to 41V)
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.7 mA
<b>Output delay with resistive load</b>	
• "0" to "1", typ.	50 µs
• "1" to "0", typ.	100 µs
<b>Parallel switching of two outputs</b>	
• for uprating	No
• for redundant control of a load	Yes
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per channel, max.	0.5 A
• Current per module, max.	2 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Analog inputs</b>	
Number of analog inputs	16
permissible input current for current input (destruction limit), max.	30 mA
<b>Input ranges</b>	
• Current	Yes; 0 ... 10 mA, 0 ... 20 mA, 4 ... 20 mA, 4 ... 20 mA HART
<b>Input ranges (rated values), currents</b>	
• 0 to 10 mA	Yes
• 0 to 20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 16 bit incl. sign
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit; Resolution with overrange (bit including sign), max. 16 bits, exception: 15 bits at 60 Hz interference suppression and 0 to 10 mA
• Integration time, parameterizable	Yes; channel by channel

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**Analog/digital module****Technical specifications**

Article number	<b>6DL1133-6EW00-0PH1</b> ET 200SP HA, AI-DI16/DQ16X24VDC HART
<b>Smoothing of measured values</b>	
• parameterizable	Yes; none, weak, medium, strong, channel-by-channel
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for current measurement as 2-wire transducer	Yes
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Errors/accuracies</b>	
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to input range, (+/-)	0.1 %
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
• Hardware interrupt	Yes; Parameterizable, channels 0 to 15, rising/falling edge
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel by channel
• Short-circuit to M	Yes; Encoder supply to M, channel by channel
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
<b>Diagnostics indication LED</b>	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	No
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED

Article number	<b>6DL1133-6EW00-0PH1</b> ET 200SP HA, AI-DI16/DQ16X24VDC HART
<b>Integrated Functions</b>	
Frequency measurement	Yes
• Number of frequency meters	8
<b>Counting functions</b>	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes; Via partner channel (digital input n+8)
• Software gate	Yes
<b>Measuring functions</b>	
• Dynamic measurement period adjustment	Yes
<b>Measuring range</b>	
- Frequency measurement, min.	0.1 Hz
- Frequency measurement, max.	5 kHz
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C; Observe derating
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C; Observe derating
<b>Dimensions</b>	
Width	22.5 mm
Height	115 mm
Depth	138 mm
<b>Weights</b>	
Weight, approx.	150 g

**Overview**

Fail-safe I/O modules permit safety-oriented monitoring and thus, when required, bringing the plant to the defined safe state. The communication and integration into the process control system is enabled with the proven technology SIMATIC Safety Integrated. The fail-safe I/O modules for DI and DO correspond to the size of the standard modules and are certified by the German Technical Inspectorate up to SIL 3 per channel. All fail-safe modules can be set up in redundant design guaranteeing not only fail-safe operation but also highest availability. SIMATIC ET 200SP HA is perfectly adapted for demanding fail-safe and standard applications in the manufacturing and process industries when high availability and PROFINET R1 redundancy are imperative.

- <https://www.siemens.com/process-safety>

**Ordering data****Article No.****F-DI 16x24VDC HA  
digital input module**

16 24 V DC digital inputs,  
color code CC01,  
for terminal block type H1 and M1,  
channel diagnostics

**6DL1136-6BA00-0PH1****F-DQ 10x24VDC/2A HA  
digital output module**

10 digital outputs 24 V DC, 2 A,  
color code CC01,  
for terminal block type H1 and M1,  
channel diagnostics

**6DL1136-6DA00-0PH1**

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

### Ex I/O modules

#### Overview

The intrinsically safe ET 200SP HA Ex I/O modules extend the SIMATIC ET 200SP HA and SIMATIC ET 200SP distributed I/O systems with the option of integrating devices located in hazardous areas (intrinsically safe sensors, actuators and HART field devices) into the system.

The ET 200SP HA Ex I/O modules with device protection according to intrinsic safety "i" offer channel outputs in Zone 0 or 1, 2-channel HART analog input and output modules and 2/4-channel digital input and output modules with different characteristic curves as well as a power module for intrinsically safe power supply of the modules.

Separate Ex isolators with correspondingly complex wiring and high space requirements are no longer required. The I/O modules can be installed up to ATEX Zone 2 and offer intrinsically safe circuits in Ex ia design for field devices up to Zone 0.

The Ex modules offer channel diagnostics and Configuration in Run and are approved for ambient temperatures from -40 to +70 °C.

#### Ordering data

#### Article No.

Ordering data	Article No.
<b>Ex digital modules SIMATIC ET 200SP HA</b>	
<b>Digital Ex-i input module, Ex-DI 4xNAMUR</b> Suitable for BaseUnit Type X1, channel diagnostics	6DL1131-6TD00-0HX1
<b>Digital Ex-i output module Ex-DQ 2x23,1VDC/20 mA</b> Suitable for BaseUnit Type X1, channel diagnostics	6DL1132-6EB00-0HX1
<b>Digital Ex-i output module Ex-DQ 2x17,4VDC/27 mA</b> Suitable for BaseUnit Type X1, channel diagnostics	6DL1132-6CB00-0HX1
<b>Ex analog modules SIMATIC ET 200SP HA</b>	
<b>Analog Ex-i HART input module, Ex-AI 2xI 2-wire HART</b> Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.3%	6DL1134-6TB00-0HX1
<b>Analog Ex-i input module, Ex-AI 4xTC/2xRTD 2-/3-/4-wire</b> Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.05%	6DL1134-6JD00-0HX1
<b>Analog Ex-i HART output module, Ex-AQ 2xI HART HF</b> Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.3%	6DL1135-6TB00-0HX1
<b>Power module and BaseUnits</b>	
<b>Power module Ex-PM E</b> 24 V 0.8 A, W x H: 50 mm x 117 mm, suitable for BaseUnit Type W0	6DL1133-6PX00-0HW0
<b>BU Type X1 for I/O modules</b> Push-in terminals, W x H: 20 mm x 117 m	6DL1193-6BP00-0BX1
<b>BU Type W0 for Ex power module PM-E</b> W x H: 50 mm x 117 mm	6DL1193-6BP00-0DW0

#### Technical specifications

Article number	<b>6DL1131-6TD00-0HX1</b> ET 200SP HA, EX-DI 4xNAMUR
<b>General information</b>	
Product type designation	Ex-DI 4xNAMUR
<b>Product function</b>	
• Isochronous mode	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	STEP 7 V5.6 SP2 or higher
• PCS 7 configurable/integrated from version	V9.1
<b>Operating mode</b>	
• DI	Yes
• Counter	Yes
• MSI	Yes
<b>Encoder supply</b>	
Number of outputs	4
Short-circuit protection	Yes
<b>Digital inputs</b>	
Number of digital inputs	4; NAMUR
Digital inputs, parameterizable	Yes
Pulse extension	Yes; 0.5 s, 1 s, 2 s
Time stamping	No
Edge evaluation	Yes; Positive edge, negative edge
Signal change flutter	Yes; 2 to 32 signal changes
Flutter observation window	Yes; 0.5 s, 1 s to 100 s in 1-s steps
<b>Input voltage</b>	
• Rated value (DC)	8.2 V
<b>Input current</b>	
<b>for 10 k switched contact</b>	
- for signal *0*	Max. 1.2 mA
- for signal *1*	Min. 2.1 mA
<b>for unswitched contact</b>	
- for signal *0*, max. (permissible quiescent current)	0.5 mA
- for signal *1*	typ. 8 mA
<b>for NAMUR encoders</b>	
- for signal *0*	0.35 to 1.2 mA
- for signal *1*	2.1 ... 6.4 mA
<b>Encoder</b>	
<b>Connectable encoders</b>	
• NAMUR encoder/changeover contact according to EN 60947	Yes
• Single contact / changeover contact unconnected	Yes
• Single contact / changeover contact connected with 10 kΩ	Yes

Article number	<b>6DL1131-6TD00-0HX1</b> ET 200SP HA, EX-DI 4xNAMUR
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Hardware interrupt	Yes; channel by channel
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Monitoring of encoder power supply	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
• Group error	Yes
<b>Diagnostics indication LED</b>	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
<b>Accuracy</b>	
- Frequency measurement	1 %
<b>Ex(i) characteristics</b>	
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>o</sub> (no-load voltage), max.	9.6 V
• I <sub>o</sub> (short-circuit current), max.	61 mA; applies for up to four circuits connected in parallel
• P <sub>o</sub> (power output), max.	145 mW; applies for up to four circuits connected in parallel
• C <sub>o</sub> (permissible external capacity), max.	3.6 μF; applies for up to four circuits connected in parallel
• L <sub>o</sub> (permissible external inductivity), max.	13 mH; applies for up to four circuits connected in parallel
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	60 V
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	55 g

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

**Ex I/O modules****Technical specifications**

Article number	<b>6DL1132-6EB00-0HX1</b> ET 200SP HA, EX-DQ 2x23, 1VDC/20MA	<b>6DL1132-6CB00-0HX1</b> ET 200SP HA, EX-DQ 2x17, 4VDC/27MA
<b>General information</b>		
<b>Product function</b>		
• Isochronous mode	No	No
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	STEP 7 V5.6 SP2 or higher	STEP 7 V5.6 SP2 or higher
• PCS 7 configurable/integrated from version	V9.1	V9.1
<b>Operating mode</b>		
• DQ	Yes	Yes
• MSO	Yes	Yes
<b>Digital outputs</b>		
Number of digital outputs	2	2
Current-sinking	No	No
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes; capacitive loads can cause wire-break diagnostics when the channel is switched off	Yes; capacitive loads can cause wire-break diagnostics when the channel is switched off
Overload protection	Yes	Yes
Limitation of inductive shutdown voltage to	DQ.n- (-1 V)	DQ.n- (-1 V)
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	20 mA; See output characteristic in manual	27 mA; See output characteristic in manual
• with inductive load, max.	20 mA; See output characteristic in manual	27 mA; See output characteristic in manual
<b>Load resistance range</b>		
• lower limit	872 Ω; See output characteristic in manual	480 Ω; parallel operation 240 ohm, see output characteristic in manual
• upper limit	10 kΩ; See output characteristic in manual	10 kΩ; parallel operation 5 kOhm, see output characteristic in manual
<b>Output current</b>		
• for signal "1" rated value	20 mA	27 mA
• for signal "0" residual current, max.	100 µA; 250 µA test current for wire break diagnostics	100 µA; 250 µA test current for wire break diagnostics, parallel operation 500 µA
<b>Output delay with resistive load</b>		
• "0" to "1", typ.	50 µs	50 µs
• "1" to "0", typ.	100 µs	100 µs
<b>Parallel switching of two outputs</b>		
• for uprating	No	Yes
<b>Switching frequency</b>		
• with resistive load, max.	500 Hz	500 Hz
• with inductive load, max.	500 Hz	500 Hz
<b>Total current of the outputs</b>		
• Current per channel, max.	20 mA	27 mA
• Current per module, max.	40 mA	54 mA
<b>Total current of the outputs (per module)</b>		
<b>horizontal installation</b>		
- up to 70 °C, max.	40 mA	54 mA
<b>vertical installation</b>		
- up to 60 °C, max.	40 mA	54 mA
<b>Cable length</b>		
• shielded, max.	500 m; Ex characteristic values must be observed	500 m; Ex characteristic values must be observed
• unshielded, max.	500 m; Ex characteristic values must be observed	500 m; Ex characteristic values must be observed



**Technical specifications**

Article number	<b>6DL1132-6EB00-0HX1</b> ET 200SP HA, EX-DQ 2x23, 1VDC/20MA	<b>6DL1132-6CB00-0HX1</b> ET 200SP HA, EX-DQ 2x17, 4VDC/27MA
<b>Interrupts/diagnostics/ status information</b>		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
• Maintenance interrupt	Yes	Yes
<b>Diagnoses</b>		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- parameterizable	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes
<b>Diagnostics indication LED</b>		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Ex(i) characteristics</b>		
<b>maximum values for connecting terminals for gas group IIC</b>		
• U <sub>o</sub> (no-load voltage), max.	24.8 V	19.4 V
• I <sub>o</sub> (short-circuit current), max.	99 mA	133 mA; parallel operation 266 mA
• P <sub>o</sub> (power output), max.	614 mW	645 mW; parallel operation 1 290 mW
• C <sub>o</sub> (permissible external capacity), max.	100 nF	232 nF; parallel operation 220 nF
• L <sub>o</sub> (permissible external inductivity), max.	3.5 mH	1.9 mH; parallel operation 328 uH
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	60 V	60 V
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels and backplane bus	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
<b>Dimensions</b>		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
<b>Weights</b>		
Weight, approx.	55 g	55 g

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**Ex I/O modules****Technical specifications**

Article number	<b>6DL1134-6TB00-0HX1</b> ET 200SP HA, EX-AI 2xI 2-WIRE HART	<b>6DL1134-6JD00-0HX1</b> ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
<b>General information</b>		
Product type designation	Ex-AI 2xI 2-wire HART	Ex-AI 4xTC/2xRTD 2-/3-/4-wire
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	STEP 7 V5.6 SP2 or higher	STEP 7 V5.6 SP2 or higher
• PCS 7 configurable/integrated from version	V9.1	V9.1
<b>Operating mode</b>		
• MSI	Yes	Yes
<b>Analog inputs</b>		
Number of analog inputs	2; Differential inputs	
• For current measurement	2	
• For voltage measurement		4
• For resistance/resistance thermometer measurement		2
• For thermocouple measurement		4
Constant measurement current for resistance-type transmitter, typ.		0.5 mA
Cycle time (all channels), min.	3 ms	
Technical unit for temperature measurement adjustable		Yes; °C/°F/K
<b>Input ranges (rated values), voltages</b>		
• -1 V to +1 V		Yes; 16 bit incl. sign
• -250 mV to +250 mV		Yes; 16 bit incl. sign
• -50 mV to +50 mV		Yes; 16 bit incl. sign
• -80 mV to +80 mV		Yes; 16 bit incl. sign
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes; 15 bit + sign	
<b>Input ranges (rated values), thermocouples</b>		
• Type B		Yes; 16 bit incl. sign
• Type C		Yes; 16 bit incl. sign
• Type E		Yes; 16 bit incl. sign
• Type J		Yes; 16 bit incl. sign
• Type K		Yes; 16 bit incl. sign
• Type L		Yes; 16 bit incl. sign
• Type N		Yes; 16 bit incl. sign
• Type R		Yes; 16 bit incl. sign
• Type S		Yes; 16 bit incl. sign
• Type T		Yes; 16 bit incl. sign
• Type U		Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST		Yes; 16 bit incl. sign
<b>Input ranges (rated values), resistance thermometer</b>		
• Cu 10		Yes; 16 bit incl. sign
• Ni 100		Yes; 16 bit incl. sign
• LG-Ni 1000		Yes; 16 bit incl. sign
• Ni 120		Yes; 16 bit incl. sign
• Ni 200		Yes; 16 bit incl. sign
• Ni 500		Yes; 16 bit incl. sign
• Pt 100		Yes; 16 bit incl. sign
• Pt 1000		Yes; 16 bit incl. sign
• Pt 200		Yes; 16 bit incl. sign
• Pt 500		Yes; 16 bit incl. sign

**Technical specifications**

Article number	<b>6DL1134-6TB00-0HX1</b> ET 200SP HA, EX-AI 2xI 2-WIRE HART	<b>6DL1134-6JD00-0HX1</b> ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
<b>Input ranges (rated values), resistors</b>		
<ul style="list-style-type: none"> <li>• 0 to 150 ohms</li> <li>• 0 to 300 ohms</li> <li>• 0 to 600 ohms</li> <li>• 0 to 3000 ohms</li> <li>• 0 to 6000 ohms</li> <li>• PTC</li> </ul>		<ul style="list-style-type: none"> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> <li>Yes; 15 bit</li> </ul>
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b> - parameterizable		Yes
<b>Cable length</b>		
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	500 m; Ex characteristic values must be observed	200 m; Ex characteristic values must be observed; line resistance at RTD (simple) max. 25 ohm; loop resistance at TC max. 8 kOhm
<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	300 m; Ex characteristic values must be observed	
<b>Analog value generation for the inputs</b>		
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)
<b>Integration and conversion time/resolution per channel</b>		
<ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> <li>• Integration time, parameterizable</li> </ul>	16 bit Yes; channel by channel	16 bit Yes; Channel-by-channel, results from the selected interference frequency suppression
<ul style="list-style-type: none"> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> <li>• Conversion time (per channel)</li> </ul>	10 / 50 / 60 Hz	16.6 / 50 / 60 Hz, channel-by-channel  180 / 60 / 50 ms, results from the selected interference frequency suppression
<b>Smoothing of measured values</b>		
<ul style="list-style-type: none"> <li>• Number of smoothing levels</li> <li>• parameterizable</li> </ul>	4; None; 4/8/16 times Yes	Yes; none, weak, medium, strong, channel-by-channel
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
<ul style="list-style-type: none"> <li>• for current measurement as 2-wire transducer</li> <li>- Burden of 2-wire transmitter, max.</li> </ul>	Yes 750 Ω; At 20 mA input current	
<b>Errors/accuracies</b>		
<b>Basic error limit (operational limit at 25 °C)</b>		
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> <li>• Resistance, relative to input range, (+/-)</li> </ul>	0.2 %	0.05 %  0.05 %
<b>Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency</b>		
<ul style="list-style-type: none"> <li>• Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>• Common mode voltage, max.</li> <li>• Common mode interference, min.</li> </ul>	60 dB	70 dB  60 V; Applicable for use in non-hazardous areas; no common mode voltage permissible in hazardous areas 90 dB
<b>Protocols</b>		
HART protocol	Yes	
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
<b>Alarms</b>		
<ul style="list-style-type: none"> <li>• Diagnostic alarm</li> <li>• Limit value alarm</li> </ul>	Yes Yes	Yes Yes; two upper and two lower limit values in each case

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

### Ex I/O modules

#### Technical specifications

Article number	<b>6DL1134-6TB00-0HX1</b> ET 200SP HA, EX-AI 2xI 2-WIRE HART	<b>6DL1134-6JD00-0HX1</b> ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W	
<b>Diagnoses</b>			
• Monitoring the supply voltage	Yes	Yes	
• Wire-break	Yes; channel by channel	Yes; channel by channel	
• Short-circuit	Yes; channel by channel		
• Group error	Yes		
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel	
<b>Diagnostics indication LED</b>			
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	
• Channel status display	Yes; green LED	Yes; green LED	
• for channel diagnostics	Yes; red LED	Yes; red LED	
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	
<b>Ex(i) characteristics</b>			
<b>maximum values for connecting terminals for gas group IIC</b>			
• U <sub>o</sub> (no-load voltage), max.	26 V	5.9 V	
• I <sub>o</sub> (short-circuit current), max.	93 mA	18 mA	
• P <sub>o</sub> (power output), max.	605 mW	27 mW	
• C <sub>o</sub> (permissible external capacity), max.	99 nF	43 µF	
• L <sub>o</sub> (permissible external inductivity), max.	4 mH	110 mH	
• U <sub>i</sub> (intrinsically safe input voltage), max.	10 V		
<b>Potential separation</b>			
<b>Potential separation channels</b>			
• between the channels and backplane bus	Yes	Yes	
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-40 °C	-40 °C	
• horizontal installation, max.	70 °C	70 °C	
• vertical installation, min.	-40 °C	-40 °C	
• vertical installation, max.	60 °C	60 °C	
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m	2 000 m	
<b>Dimensions</b>			
Width	20 mm	20 mm	
Height	73 mm	73 mm	
Depth	58 mm	58 mm	
<b>Weights</b>			
Weight, approx.	55 g	55 g	
Article number	<b>6DL1135-6TB00-0HX1</b> ET 200SP HA, EX-AQ 2xI HART	Article number <b>6DL1135-6TB00-0HX1</b> ET 200SP HA, EX-AQ 2xI HART	
<b>General information</b>		<b>Operating mode</b>	
Product type designation	Ex-AQ 2xI HART	• MSO	Yes
<b>Product function</b>		<b>Analog outputs</b>	
• I&M data	Yes; I&M0 to I&M3	Number of analog outputs	2
• Isochronous mode	No	Cycle time (all channels), min.	3 ms
<b>Engineering with</b>		<b>Output ranges, current</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP	• 0 to 20 mA	Yes; 15 bit
• STEP 7 configurable/integrated from version	STEP 7 V5.6 SP2 or higher	• 4 mA to 20 mA	Yes; 16 bit incl. sign
• PCS 7 configurable/integrated from version	V9.1	<b>Connection of actuators</b>	
		• for current output two-wire connection	Yes

#### Technical specifications

Article number	<b>6DL1135-6TB00-0HX1</b> ET 200SP HA, EX-AQ 2xI HART
<b>Load impedance (in rated range of output)</b>	
• with current outputs, max.	500 Ω
• with current outputs, inductive load, max.	Ex characteristic values must be observed
<b>Cable length</b>	
• shielded, max.	500 m; Ex characteristic values must be observed
• unshielded, max.	300 m; Ex characteristic values must be observed
<b>Settling time</b>	
• for resistive load	1 ms; 500 ohms
<b>Errors/accuracies</b>	
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to output range, (+/-)	0.2 %
<b>Protocols</b>	
HART protocol	Yes
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes; Module-wise
• Wire-break	Yes; From output value > 240 μA
• Short-circuit	Yes; < 20 ohms as of 1 mA output value
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
<b>Diagnostics indication LED</b>	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED

Article number	<b>6DL1133-6PX00-0HW0</b> ET 200SP HA, Ex-PM E POWER MODULE
<b>General information</b>	
Product type designation	Ex-PM-E
<b>Product function</b>	
• I&M data	Yes; Asset data
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Output current</b>	
<b>horizontal installation</b>	
• up to 60 °C, max.	0.8 A
• up to 70 °C, max.	0.6 A
<b>vertical installation</b>	
• up to 50 °C, max.	0.8 A
• up to 60 °C, max.	0.6 A

Article number	<b>6DL1135-6TB00-0HX1</b> ET 200SP HA, EX-AQ 2xI HART
<b>Ex(i) characteristics</b>	
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>o</sub> (no-load voltage), max.	22 V
• I <sub>o</sub> (short-circuit current), max.	91 mA
• P <sub>o</sub> (power output), max.	501 mW
• C <sub>o</sub> (permissible external capacity), max.	151 nF
• L <sub>o</sub> (permissible external inductivity), max.	4.1 mH
• U <sub>i</sub> (intrinsically safe input voltage), max.	10 V
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	60 V
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Dimensions</b>	
Width	20 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	55 g

Article number	<b>6DL1133-6PX00-0HW0</b> ET 200SP HA, Ex-PM E POWER MODULE
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• missing load voltage	Yes
<b>Diagnostics indication LED</b>	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**Ex I/O modules****Technical specifications**

Article number	<b>6DL1133-6PX00-0HW0</b> ET 200SP HA, Ex-PM E POWER MODULE		Article number	<b>6DL1133-6PX00-0HW0</b> ET 200SP HA, Ex-PM E POWER MODULE	
<b>Ex(i) characteristics</b>			<b>Altitude during operation relating to sea level</b>		
Module for Ex(i) protection	Yes		• Installation altitude above sea level, max.	2 000 m	
<b>maximum values for connecting terminals for gas group IIC</b>			<b>Dimensions</b>		
• Um (voltage at non-intrinsically safe connecting terminals), max.	60 V; power supply and backplane bus		Width	50 mm	
<b>Potential separation</b>			Height	114 mm	
primary/secondary	Yes		Depth	67.5 mm	
<b>Ambient conditions</b>			<b>Weights</b>		
<b>Ambient temperature during operation</b>			Weight, approx.	182 g	
• min.	-40 °C				
• max.	70 °C; with derating				
Article number	<b>6DL1193-6BP00-0DW0</b> ET 200SP HA, Ex-BU TYPE W0	<b>6DL1193-6BP00-0BX1</b> ET 200SP HA, Ex-BU TYPE X1			
<b>General information</b>					
Product type designation	BU type W0	BU type X1			
<b>Product function</b>					
• I&M data	Yes; Asset data	Yes; Asset data			
<b>Hardware configuration</b>					
<b>Slots</b>					
• Number of slots	1	1			
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• horizontal installation, min.	-40 °C	-40 °C			
• horizontal installation, max.	70 °C	70 °C			
• vertical installation, min.	-40 °C	-40 °C			
• vertical installation, max.	60 °C	60 °C			
<b>Altitude during operation relating to sea level</b>					
• Installation altitude above sea level, max.	2 000 m	2 000 m			
<b>Connection method</b>					
<b>Terminals</b>					
• Terminal type		Push-in terminal			
• Conductor cross-section, min.		0.14 mm <sup>2</sup>			
• Conductor cross-section, max.		2.5 mm <sup>2</sup>			
• Number of process terminals to I/O module		8			
<b>Dimensions</b>					
Width	50 mm	20 mm			
Height	117 mm	117 mm			
Depth	19 mm	35 mm			
<b>Weights</b>					
Weight, approx.	38 g	42 g			

## Overview

### Mounting rails

The mounting rail is required for fitting an ET 200SP HA station in the control cabinet. The IM carrier modules for interface modules, the carrier modules for the I/O modules and the server module are attached to the mounting rail.

The mounting rails are available in lengths of 482 mm (for installation in a 19-inch rack) and 1 500 mm (for maximum configuration and vertical installation in a cabinet).



IM single carrier module



IM redundant carrier module

### IM carrier modules for interface modules

Two versions of the IM carrier modules for interface modules are available:

- IM single carrier module for 1 interface module, for single connection to PROFINET
- IM redundant carrier module for 2 interface modules, for redundant connection to PROFINET

The IM carrier modules connect the interface module to the backplane bus. They enable data exchange with the I/O modules.



Carrier module for I/O modules, 8-slot



Carrier module for I/O modules, 2-slot

### Carrier modules for I/O modules

The slots for the I/O modules are created by the connection of these carrier modules to the terminal blocks.

Carrier modules for I/O modules are available in the following versions:

- Carrier module, 2-slot, with 2 slots for I/O modules
- Carrier module, 8-slot, with 8 slots for I/O modules

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

**Carrier modules****Overview**

ET 200SP HA, server module

**Server module**

Server module and power bus cover complete the design of the ET 200SP HA. A server module and a power bus cover are supplied with each IM carrier module for the interface module.

**Ordering data****Article No.****Mounting rails for ET 200SP HA****482 mm (approx. 19 inch) mounting rail**

Including grounding screw and integrated top hat rail for fitting small components such as clamps, fuses and relays

6DL1193-6MC00-0AA0

**1 500 mm (approx. 59 inch) mounting rail**

Including grounding screw and integrated top hat rail for fitting small components such as clamps, fuses and relays

6DL1193-6MD00-0AA0

**Grounding screw**

For connecting PE to the mounting rail; essential for 1 500 mm mounting rail

20 units per packing unit

6ES7590-5AA00-0AA0

**IM carrier modules for interface modules**

Note:

A server module and a power bus cover are supplied with each IM carrier module for the interface module.

**IM single carrier module**

Rack for 1 SIMATIC ET 200SP HA interface module for single connection to PROFINET

6DL1193-6BH00-0SM0

**IM redundant carrier module**

Rack for 2 SIMATIC ET 200SP HA interface modules for redundant connection to PROFINET

6DL1193-6BH00-0RM0

**Carrier modules for I/O modules****Carrier module, 2-slot**

Rack for 2 SIMATIC ET 200SP HA I/O modules

6DL1193-6GA00-0NNO

**Carrier module 8-slot**

Rack for 8 SIMATIC ET 200SP HA I/O modules

6DL1193-6GC00-0NNO

**Spare parts****Server module (spare part) for ET 200SP HA**

6DL1193-6PA00-0AA0



#### Technical specifications

Article number	<b>6DL1193-6BH00-0SM0</b> CARRIER MODULE IM SINGLE	<b>6DL1193-6BH00-0RM0</b> CARRIER MODULE IM REDUNDANT
<b>General information</b>		
Product type designation	IM carrier module, single	Carrier module IM redundant
<b>Product function</b>		
• I&M data	Yes; Asset data	Yes; Asset data
<b>Hardware configuration</b>		
<b>Slots</b>		
• Number of slots	1	2
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
<b>Dimensions</b>		
Width	100 mm	100 mm
Height	204 mm	204 mm
Depth	52 mm	52 mm
<b>Weights</b>		
Weight, approx.	250 g	224 g
Article number	<b>6DL1193-6GA00-0NNO</b> CARRIER MODULE TWOFOLD	<b>6DL1193-6GC00-0NNO</b> CARRIER MODULE EIGHTFOLD
<b>General information</b>		
Product type designation	Carrier module 2 times	Carrier module 8 times
<b>Product function</b>		
• I&M data	Yes; Asset data	Yes; Asset data
<b>Hardware configuration</b>		
<b>Slots</b>		
• Number of slots	2	8
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
<b>Dimensions</b>		
Width	52.5 mm; 45 mm when installed	187.5 mm; 180 mm when installed
Height	203 mm	203 mm
Depth	79 mm	79 mm
<b>Weights</b>		
Weight, approx.	111 g	450 g

## I/O systems

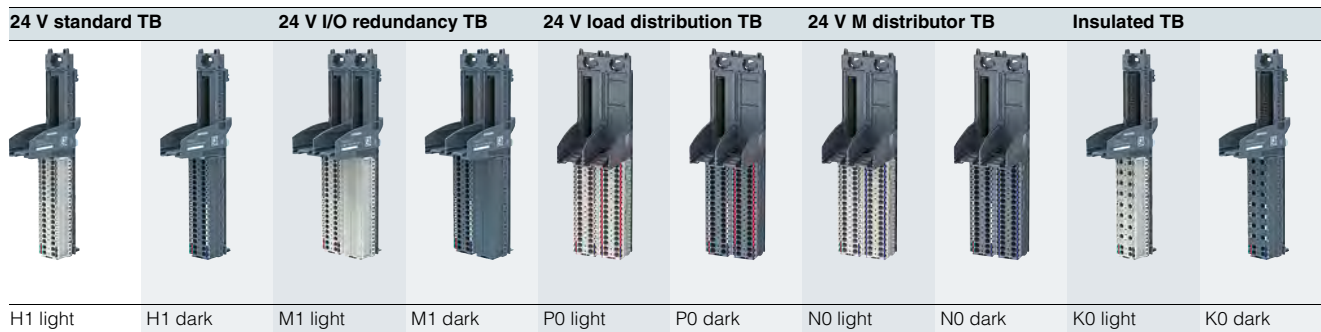
SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA

### Terminal blocks

#### Overview

The slots for the I/O modules are created by connecting carrier modules and terminal blocks. The terminal blocks contain the process terminals for connecting sensors, actuators and other devices.

#### Overview of terminal blocks



Select the terminal block for the slot of an I/O module based on the following dependencies:

- Definition of I/O modules associated with a potential group
- Requirement for design with redundant I/O modules (redundant partner in adjacent slot)
- Requirement for design with potential distributors (e.g. when using 32-channel I/O modules)

The following table illustrates the terminal block / I/O module assignment (x = standard):

Terminal block / I/O module	24 V standard TB (H1)	24 V I/O redundancy TB (M1)	24 V load distribution TB (P0)	24 V M distributor TB (NO)	Insulated TB (K0)
DI 16x24VDC	x	Optional		Optional <sup>1)</sup>	
DI 32x24VDC	Optional		x		
DI 16xNAMUR	x	Optional		Optional <sup>1)</sup>	
DI 8x125VDC					x
DI 8x230VAC					x
DQ 16x24V/0.5A	x	Optional		Optional <sup>1)</sup>	
DQ 32x24V/0.5A	Optional			x	
RQ 4x230/5A CO					x
DI-AI 16x / DQ16x	x	Optional		Optional <sup>1)</sup>	
AI 16xI HART	x	Optional		Optional <sup>1)</sup>	
AI 16xTC 8xRTD	x	Optional			
AQ 8xI HART	x	Optional		Optional <sup>1)</sup>	

<sup>1)</sup> Offers additional ground points for field connection

#### Potential groups/color type of the terminal blocks

Potential groups on ET 200SP HA stations come in both a light and a dark version to help you distinguish them:

- Each light-colored terminal block that is fitted in the station starts a new potential group. The first terminal block fitted (on the first carrier module immediately to the right of the interface module) is therefore light-colored.
- Each dark terminal block forms a contact with the supply voltage of the terminal block to its left, thus extending the potential group.

Note the maximum permissible load current depending on the number of I/O modules:

Number of terminal blocks	Permissible load current in amperes
4	10 A
5	8 A
6	7 A
7	6 A
8	5 A
10	4 A
15	3 A
20	2 A

Ordering data	Article No.	Article No.
<b>Terminal blocks 24 V DC</b>		<b>Terminal blocks insulated (24 V DC / 125 V DC / 230 V AC)</b>
<b>Terminal block type H1 light</b> For starting a new potential group, with 32 push-in terminals, width 22.5 mm, with temperature compensation	6DL1193-6TP00-0DH1	<b>Terminal block type K0 light</b> For starting a new potential group, with 16 push-in terminals, width 22.5 mm
<b>Terminal block type M1 light</b> For starting a new potential group, with 32 push-in terminals, width 45 mm, for redundant configurations, with temperature compensation	6DL1193-6TP00-0DM1	<b>Terminal block type K0 dark</b> For forwarding a potential group, with 16 push-in terminals, width 22.5 mm
<b>Terminal block type P0 light</b> For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals with encoder supply, width 45 mm, specially for use with DI 32x24 V DC (6DL1131-6BL00-0PH1)	6DL1193-6TP00-0DP0	<b>Accessories</b>  <b>Shield connection for terminal block</b> 5 shield supports and 5 shield terminals, for direct connection
<b>Terminal block type N0 light</b> For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals for ground connection, width 45 mm, for use with DQ 32x 24 V DC (6DL1132-6BL00-0PH1) and other modules	6DL1193-6TP00-0DN0	
<b>Terminal block type H1 dark</b> For forwarding a potential group, with 32 push-in terminals, width 22.5 mm, with temperature compensation	6DL1193-6TP00-0BH1	
<b>Terminal block type M1 dark</b> For forwarding a potential group, with 32 push-in terminals, width 45 mm, for redundant configurations, with temperature compensation	6DL1193-6TP00-0BM1	
<b>Terminal block type P0 dark</b> For forwarding a potential group, with 32 push-in terminals, additional 32 push-in terminals with encoder supply, width 45 mm, specially for use with DI 32x24 V DC (6DL1131-6BL00-0PH1)	6DL1193-6TP00-0BP0	
<b>Terminal block type N0 dark</b> For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals for ground connection, width 45 mm, for use with DQ 32x 24 V DC (6DL1132-6BL00-0PH1) and other modules	6DL1193-6TP00-0BN0	

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**Terminal blocks****Technical specifications**

Article number	<b>6DL1193-6TP00-0DH1</b> TERMINAL BLOCK, TYPE H1, LIGHT-GREY	<b>6DL1193-6TP00-0BH1</b> TERMINAL BLOCK, TYPE H1, DARK-GREY	<b>6DL1193-6TP00-0DM1</b> TERMINAL BLOCK, TYPE M1, LIGHT-GREY	<b>6DL1193-6TP00-0BM1</b> TERMINAL BLOCK, TYPE M1, DARK-GREY	<b>6DL1193-6TP00-0DP0</b> TERMINAL BLOCK, TYPE P0, LIGHT-GREY	<b>6DL1193-6TP00-0BP0</b> TERMINAL BLOCK, TYPE P0, DARK-GREY
<b>General information</b>						
Product type designation	Type H1	Type H1	Type M1	Type M1	Type P0	Type P0
<b>Product function</b>						
• I&M data	Yes; Asset data	Yes; Asset data	Yes; Asset data	Yes; Asset data	Yes	Yes
<b>Input current</b>						
Current consumption, max.					640 mA; With one 20 mA encoder supply per channel	640 mA; With one 20 mA encoder supply per channel
<b>Hardware configuration</b>						
<b>Slots</b>						
• Number of slots	1	1	2; For IO redundancy	2; For IO redundancy	1	1
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
<b>Dimensions</b>						
Width	22.5 mm	22.5 mm	45 mm	45 mm	45 mm	45 mm
Height	175 mm	175 mm	175 mm	175 mm	175 mm	175 mm
Depth	77 mm	77 mm	77 mm	77 mm	77 mm	77 mm
<b>Weights</b>						
Weight, approx.	80 g	80 g	155 g	155 g	155 g	155 g
Article number	<b>6DL1193-6TP00-0DN0</b> TERMINAL BLOCK, TYPE N0, LIGHT-GREY	<b>6DL1193-6TP00-0BN0</b> TERMINAL BLOCK, TYPE N0, DARK-GREY	<b>6DL1193-6TP00-0DK0</b> TERMINAL BLOCK, TYPE K0, LIGHT-GREY	<b>6DL1193-6TP00-0BK0</b> TERMINAL BLOCK, TYPE K0, DARK-GREY		
<b>General information</b>						
Product type designation	Type N0	Type N0	Type K0	Type K0		
<b>Product function</b>						
• I&M data	Yes	Yes	Yes; Asset data	Yes; Asset data		
<b>Hardware configuration</b>						
<b>Slots</b>						
• Number of slots	1	1	1	1		
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C		
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C		
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C		
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C		
<b>Dimensions</b>						
Width	45 mm	45 mm	22.5 mm	22.5 mm		
Height	175 mm	175 mm	175 mm	175 mm		
Depth	77 mm	77 mm	77 mm	77 mm		
<b>Weights</b>						
Weight, approx.	155 g	155 g	78 g	78 g		

## Overview



BusAdapter BA 2xRJ45, 2xFC and 2xLC

**BusAdapter**

A BusAdapter as a separate component allows a free choice of connection technology:

- BA 2xRJ45: 2 electrical connections for bus cable with standard RJ45 connector
- BA 2xFC: 2 electrical connections for direct connection of FastConnect bus cable
- BA 2xLC: 2 optical ports for fiber-optic cables

## Ordering data

## Article No.

Ordering data	Article No.
<b>BusAdapter</b>	
<b>BusAdapter 2xRJ45</b> 2 × RJ45 sockets for PROFINET (standard Ethernet socket)	<b>6DL1193-6AR00-0AA0</b>
<b>BusAdapter 2xFC</b> 2 × FastConnect (FC) connections for PROFINET	<b>6DL1193-6AF00-0AA0</b>
<b>BusAdapter 2xLC</b> 2 × glass fiber-optic connections for PROFINET	<b>6DL1193-6AG00-0AA0</b>
<b>BusAdapter BA LC/RJ45</b> 2 × glass fiber-optic connections	<b>6DL1193-6AG20-0AA0</b>
<b>BusAdapter BA LC/FC</b> 2 × glass fiber-optic connections	<b>6DL1193-6AG40-0AA0</b>
<b>BusAdapter BA 2xRJ45 (VD)</b> 2 × electrical connections for Ethernet communication via 2-, 4- or 8-wire copper cables and distances up to 500 m	<b>6GK5991-2VA00-8AA2</b>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200SP HA**BusAdapter****Technical specifications**

Article number	<b>6DL1193-6AR00-0AA0</b> ET 200SP HA, BUSADAPTER BA 2XRJ45	<b>6DL1193-6AF00-0AA0</b> ET 200SP HA, BUSADAPTER BA 2XFC	<b>6DL1193-6AG00-0AA0</b> ET 200SP HA, BUSADAPTER BA 2XLC
<b>General information</b>			
Product type designation	BA 2x RJ45	BA 2xFC	BA 2XLC
<b>Interfaces</b>			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1; 2 ports (switch) FC	1; 2 ports (switch) LC Multimode Glass Fibre
<b>Supports protocol for PROFINET IO</b>			
<ul style="list-style-type: none"> <li>Number of RJ45 ports</li> <li>Number of FC (FastConnect) connections</li> <li>Number of LC ports</li> </ul>	2	2	2
<b>Cable length</b>			
- Cu conductors	100 m	100 m	
- Multimode graded-index fiber 50/125 µm			3 km
- Multimode graded-index fiber 62.5/125 µm			3 km
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	65 °C; redundant design (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontal, max. 50 °C vertical. When using different I/O devices, the derating specified there must be observed
<b>Dimensions</b>			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm	59 mm
<b>Weights</b>			
Weight, approx.	46 g	53 g	60 g

**Overview**

Extending the SIMATIC ET 200SP HA system with specific additional I/O modules from the SIMATIC ET 200SP system gives you more options and flexibility.

When these I/O modules are used, the following aspects need to be considered:

- Special slot rules apply. The additional I/O modules from the SIMATIC ET 200SP system can only be operated at the end, after the Standard SIMATIC ET 200SP HA I/O modules. Mixed configuration is not permissible.
- Module redundancy is not supported for the additional I/O modules.
- Attention must be paid to the specific properties of the additional I/O modules, such as ambient temperature, painting, insulation protection. These are usually limited compared to the ET 200SP HA I/O modules.

**Analog input module AI Energy Meter Standard, 480 V AC, BU type D0**

- Can be plugged into type D0 BaseUnits (BU) with automatic coding
- LED display for error, operation, power, and status
- Clear labeling on front of module
- Optional labeling accessories
- Optional module-specific color coding of the terminals according to the CC color code

**SIWAREX WP321 weighing controller**

A versatile and flexible weighing module for the seamless integration of a static scale into the SIMATIC automation environment.

The electronic weighing system is integrated in the SIMATIC ET 200SP series and uses all the features of a modern automation system, such as integrated communication, operator control and monitoring, diagnostic systems and configuration tools in the TIA Portal, SIMATIC STEP 7, WinCC flexible and PCS 7.

**Valve terminal AirLINE SP type 8647 for integration in ET 200SP HA**

- For pneumatic control of actuators with ET 200SP HA
- Can be used together with system and IO components of the ET 200SP HA distributed I/O system
- Bürkert Fluid Control Systems product, can only be obtained from Bürkert Fluid Control Systems product partner

**Note:**

Product partners are external companies outside Siemens AG and its associated companies. Information and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the respective product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners.

**Ordering data****Article No.****Analog input module**

AI Energy Meter  
Standard 480 V AC, BU type D0

**6ES7134-6PA20-0BD0****SIWAREX WP321 weighing controller**

Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 × LC, 1 × RS 485.

**7MH4138-6AA00-0BA0****Valve terminal AirLINE SP type 8647 for integration in ET 200SP HA**

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly:  
<https://www.burkert-usa.com/en/type/8647>

**\* Disclaimer of liability**

This information and the descriptions have been compiled with great care. However, it is not possible for Siemens to verify that the data supplied by product partners is complete, correct and up-to-date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the products for the user per se.

## I/O systems

### SIMATIC ET 200 systems for the control cabinet

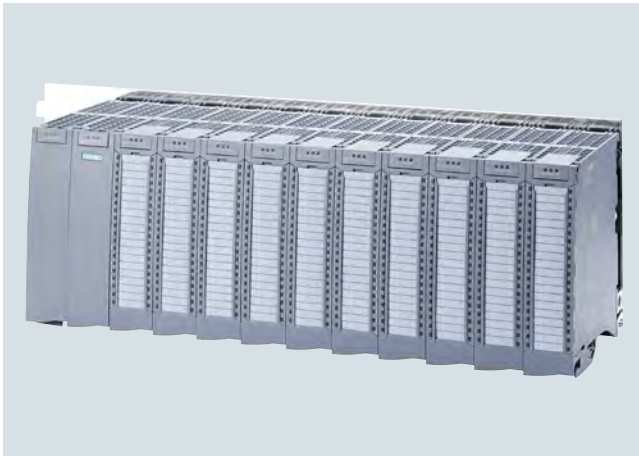
#### SIMATIC ET 200MP

##### Overview



SIMATIC ET 200MP Video

[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6147385583001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6147385583001)



SIMATIC ET 200MP is a modular and scalable I/O system with IP20 degree of protection for universal use, and offers the same system advantages as SIMATIC S7-1500. SIMATIC ET 200MP permits extremely short bus cycle times and very fast response times, even with large quantity structures.

SIMATIC ET 200MP consists of the following components:

- Interface modules for connecting S7-1500 I/O modules to PROFINET; up to 30 modules can be connected to one interface module
- Interface module for connecting S7-1500 I/O modules to PROFIBUS; up to 12 modules can be connected to one interface module

The SIMATIC ET 200MP distributed I/O system is particularly easy to install, wire, and commission.

With its extended ambient conditions, SIMATIC ET 200MP can be used almost anywhere. Many modules can be operated in a temperature range from -30°C to +60°C and at altitudes up to 5,000 m as standard. A wide range of SIPLUS modules is available for requirements beyond this.

Highlights:

- Modular I/O system with IP20 degree of protection for PROFINET or alternatively for PROFIBUS
- Compact dimensions and high channel density
- High degree of user-friendliness due to the following design features:
  - High channel density through 35 mm wide modules with up to 64 digital channels
  - Standardized 40-pin front connector simplifies ordering, logistics, and warehousing
  - Standardized pin assignment per module type simplifies wiring and helps avoid errors
  - Integrated potential bridges simplify wiring and allow flexible subsequent modification of potential groups
  - The cable storage space grows along with the requirements and allows a uniform appearance even with insulated conductors with a large core cross-section and/or thick insulation
  - The prewiring position for the front connector allows convenient wiring during both initial commissioning and when making changes during operation
  - The mounting rail integrated in the S7-1500 DIN rail allows snapping-on of many standard components such as additional terminals, miniature circuit breakers or small relays
  - The 1:1 assignment of channel status and diagnostics LED, terminal and inscription allows fast location and elimination of errors. Assistance is provided by the wiring diagram printed on the inside of the front panels
  - The integrated shielding concept for analog and technology modules allows reliable and rugged operation, in particular with High Speed applications. Installation does not require any tools
  - Particularly space-saving and simple design with slim 25 mm modules and high-density modules; the maximum possible station configuration with power supply (PS), interface module (IM) and 30 I/O modules can be accommodated on a 830 mm-wide S7-1500 mounting rail
- Comprehensive product portfolio comprising digital and analog input or output modules, technology modules, communications modules for IO-Link and point-to-point communication, and F-modules up to SIL3.
  - Integrated technological functions in selected modules, such as counting, pulse width modulation (PWM) or integrated switching cycle counters, make cost-effective and convenient solutions possible.
  - Selected digital output modules enable safety-related load group shutdown in accordance with SILCL 2 via an external safety relay.



## Overview

- Extensive system functions
  - Integrated system diagnostics when operated with S7-1500 and TIA Portal
  - Integrated switching cycle counter for relay modules enables preventive maintenance
  - Consistent use of identification and maintenance data IM0 to IM3 for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.)
  - Uniform firmware update for the interface module and all I/O modules for subsequent expansion of functions (investment security)
  - Bus cycle time  $\geq 250 \mu\text{s}$  and coupling to the isochronous task permit implementation of applications with high performance requirements with PROFINET
  - Up to 30 I/O modules (PROFINET) or 12 I/O modules (PROFIBUS) within a station save on interface modules and installation time
  - MMC not required with PROFINET; automatic address assignment via LLDP or manually via TIA Portal or PST tool
  - Shared device on up to two (IM 155-5 PN BA and IM 155-5 PN ST) or four (IM 155-5 PN HF) IO Controllers
  - Module shared input/module shared output as system function for all S7-1500 I/O modules
- High plant availability:
  - Increased communication availability by means of Media Redundancy Protocol (MRP, MRPD) on PROFINET as well as operation of the IM 155-5 PN HF on an S7-1500 R/H using S2 redundancy; in addition, the IM 155-5 PN HF High Feature interface module can be operated on an S7-400H. Configuration is carried out with STEP 7 V5.5 SP3 and a GSDML file. The IM 155-5 PN HF also supports operation on an S7-400H CPU (system redundancy).
  - Increased plant availability due to the active backplane bus for up to 12 I/O modules per station; allows reaction-free pulling and plugging of I/O modules in operation without a CPU STOP; allows holding of reserves (empty slots) for plant expansion at a later time.

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200MP

Interface modules > IM 155-5 PN

### Overview



- Interface modules for connecting ET 200MP to PROFINET
- These handle data exchange with the PROFINET IO Controller in the PLC
- Integrated 2-port switch for line topology

#### IM 155-5 PN BA

- Max. 12 I/O modules
- Operation of F-modules and PROFIsafe
- Shortest bus cycle time 1 ms
- Media redundancy (MRP)
- Shared device on up to 2 IO controllers
- Omission of SIMATIC Memory Card (SMC); IM replacement without PG using LLDP

#### IM 155-5 PN ST, IM 155-5 PN HF

- Max. 30 I/O modules
- Shortest bus cycle 250  $\mu$ s
- Connecting to the isochronous task of the CPU
- Prioritized fast startup (FSU) with max. 12 I/O modules
- Media Redundancy Protocol (MRP)
- Shared device on up to two IO controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC Memory Card (SMC); IM replacement without PG using LLDP
- Operation of F-modules and PROFIsafe
- Submodule-granular shared device with up to two IO controllers
- Configuration control (option handling)
- Module shared input and module shared output (MSI/MSO), i.e. the inputs or outputs of a module can be made available simultaneously to up to two IO controllers

The IM155-5 PN HF interface module has the following additional functions:

- Shared device on up to 4 IO controllers
- Module shared input and module shared output (MSI/MSO) on up to four IO controllers
- Operation on a highly available SIMATIC S7-400H
- Support for the MRPD function (media redundancy with planned duplication)
- S2 redundancy for operation with an S7-1500 R/H
- Operation on the active backplane bus (as of FW V 4.4.1)

**Overview**

	<b>IM 155-5 PN BA</b>	<b>IM 155-5 PN ST</b>	<b>IM 155-5 PN HF</b>
Article No.	6ES7155-5AA00-0AA0	6ES7155-5AA01-0AB0	6ES7155-5AA00-0AC0
<b>Quantity structures</b>			
IO modules	All except PROFI-safe	All	All
Max. number IO modules / IM	12	30	30
Max. number of bytes / slot	64 inputs	256 inputs	256 inputs
	64 outputs	256 outputs	256 outputs
Max. number bytes / station	64 inputs	512 inputs	512 inputs
	64 outputs	512 outputs	512 outputs
Update time	1 ms	250 µs	250 µs
<b>Configuration</b>			
GSDML	Yes	Yes	Yes
STEP 7	GSDML	GSDML	GSDML
TIA Portal	Yes	Yes	Yes
PCS 7	No	No	No
<b>General functions</b>			
Reset to factory settings	TIA Portal	TIA Portal	TIA Portal
Device replacement: without PG	LLDP	LLDP	LLDP
Configuration management (option handling)	No	Yes	Yes
I&M data	IM 0 ... 3	IM 0 ... 3	IM 0 ... 3
Isochronous mode	No	Yes	Yes
PROFI-safe	No	Yes	Yes
<b>PROFINET functions</b>			
RT	Yes	Yes	Yes
IRT	No	Yes	Yes
MRP	Yes	Yes	Yes
MRPD	No	No	Yes
S2 redundancy	No	No	Yes
Fast startup	No	Yes	Yes
Shared device	Yes; up to 2 ctrl.	Yes; up to 2 ctrl.	Yes; up to 4 ctrl.
MSI / MSO	Yes	Yes	Yes
Submodules	Yes	Yes	Yes

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200MP**Interface modules > IM 155-5 PN****Ordering data****IM 155-5 PN interface module**IP20 degree of protection,  
module width 35 mm,  
installation on S7-1500 DIN rail

IM 155-5 PN BA, Basic version

IM 155-5 PN ST, Standard version

IM 155-5 PN HF, High Feature  
version with additional functions**Article No.****6ES7155-5AA00-0AA0****6ES7155-5AA01-0AB0****6ES7155-5AA00-0AC0****Accessories****Front flap for IM 155-5 PN  
(spare part), 5 units****6ES7528-0AA70-7AA0****SIMATIC S7-1500 DIN rail**Fixed lengths,  
with grounding elements

- 160 mm
- 245 mm
- 482 mm
- 530 mm
- 830 mm

**6ES7590-1AB60-0AA0****6ES7590-1AC40-0AA0****6ES7590-1AE80-0AA0****6ES7590-1AF30-0AA0****6ES7590-1AJ30-0AA0**For cutting to length by customer,  
without drill holes;  
grounding elements must be  
ordered separately

- 2 000 mm

**6ES7590-1BC00-0AA0****PE connection element  
for DIN rail 2 000 mm****6ES7590-5AA00-0AA0**

20 units

**System power supply**For supplying the  
S7-1500 backplane bus

24 V DC input voltage, power 25 W

**6ES7505-0KA00-0AB0**24/48/60 V DC input voltage,  
power 60 W**6ES7505-0RA00-0AB0**24/48/60 V DC input voltage,  
power 60 W, buffering functionality**6ES7505-0RB00-0AB0**120/230 V AC input voltage,  
power 60 W**6ES7507-0RA00-0AB0****Power plug****6ES7590-8AA00-0AA0**With coding element  
for power supply module;  
spare part, 10 units**Load power supply**

24 V DC/3 A

**6EP1332-4BA00**

24 V DC/8 A

**6EP1333-4BA00****Power supply connector**Spare part; for connecting the  
24 V DC supply voltage

- with push-in terminals

**6ES7193-4JB00-0AA0****Active backplane bus****6ES7590-0BL00-0AA0**With 12 slots for  
ET 200MP I/O modules  
for hot swapping; for insertion  
in the S7-1500 DIN rail.  
Please order S7-1500 DIN rail and  
slot covers separately**Article No.****Slot cover  
for active backplane bus****6ES7590-0CA00-0AA0**To protect against electrostatic  
discharge as well as provide  
mechanical stability on the S7-1500  
DIN rail; 5 units per packing unit**IE FC RJ45 plugs**RJ45 plug connector for  
Industrial Ethernet with a rugged  
metal enclosure and integrated  
insulation displacement contacts  
for connecting Industrial Ethernet  
FC installation cables**IE FC RJ45 plug 180**

180° cable outlet

1 unit

**6GK1901-1BB10-2AA0**

10 units

**6GK1901-1BB10-2AB0**

50 units

**6GK1901-1BB10-2AE0****IE FC TP standard cable GP 2x2****6XV1840-2AH10**4-wire, shielded  
TP installation cable for  
connection to IE FC RJ45 outlet/  
IE FC RJ45 plug;  
PROFINET-compatible;  
with UL approval;Sold by the meter;  
max. delivery unit 1 000 m;  
minimum order quantity 20 m**IE FC TP trailing cable 2 x 2  
(Type C)****6XV1840-3AH10**4-wire, shielded TP installation  
cable for connection to  
IE FC RJ45 outlet/  
IE FC RJ45 plug 180/90  
for use in cable carrier;  
PROFINET-compatible;  
with UL approval;Sold by the meter;  
max. delivery unit 1 000 m;  
minimum order quantity 20 m**IE FC TP marine cable 2 x 2  
(Type B)****6XV1840-4AH10**4-wire, shielded TP installation  
cable for connection to  
IE FC RJ45 outlet/  
IE FC RJ45 plug 180/90  
marine certified;Sold by the meter; max.  
delivery unit 1 000 m; minimum  
order quantity 20 m**IE FC stripping tool****6GK1901-1GA00**Pre-adjusted stripping tool  
for fast stripping of  
Industrial Ethernet FC cables

### Technical specifications

Article number	<b>6ES7155-5AA00-0AA0</b> ET 200MP, IM 155-5 PN BA	<b>6ES7155-5AA00-0AC0</b> ET 200MP, IM 155-5 PN HF	<b>6ES7155-5AA01-0AB0</b> ET 200MP, IM 155-5 PN ST
<b>General information</b>			
Product type designation	IM 155-5 PN BA	IM 155-5 PN HF	IM 155-5 PN ST
<b>Product function</b>			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	No	Yes; In combination with active backplane bus	No
• Isochronous mode	No	Yes	Yes
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/integrated from version	V15.1 with HSP 187	V16 with HSP 308	V14 or higher with HSP 0223 / integrated with V15 or higher
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	GSDML V2.32
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes
<b>Input current</b>			
Current consumption (rated value)	1 A	0.2 A	0.2 A
<b>Address area</b>			
<b>Address space per station</b>			
• Address space per station, max.	64 byte; per input / output	512 byte; per input / output	512 byte; per input / output
<b>Hardware configuration</b>			
Integrated power supply	Yes	Yes	Yes
<b>Rack</b>			
• Modules per rack, max.	12; I/O modules	30; I/O modules	30; I/O modules
<b>Submodules</b>			
• Number of submodules per station, max.	108; 9 submodules / I/O modules	256	
<b>Interfaces</b>			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1	1
<b>1. Interface</b>			
<b>Interface types</b>			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• BusAdapter (PROFINET)	No		
<b>Protocols</b>			
• PROFINET IO Device	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes; PROFINET MRP
<b>Interface types</b>			
<b>RJ 45 (Ethernet)</b>			
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes	Yes	Yes
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
<b>PROFINET IO Device</b>			
<b>Services</b>			
- IRT	No	Yes	Yes
- PROFIenergy	No	No	No
- Prioritized startup	No	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	4	2

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200MP**Interface modules > IM 155-5 PN****Technical specifications**

Article number	<b>6ES7155-5AA00-0AA0</b> ET 200MP, IM 155-5 PN BA	<b>6ES7155-5AA00-0AC0</b> ET 200MP, IM 155-5 PN HF	<b>6ES7155-5AA01-0AB0</b> ET 200MP, IM 155-5 PN ST
<b>Redundancy mode</b>			
• PROFINET system redundancy (S2) - on S7-1500R/H - on S7-400H	No	Yes Yes Yes; With GSDML file as of STEP 7 V5.5 SP3	No
• Redundant PROFINET configuration (R1)		No	No
• H-Sync forwarding		Yes	
<b>Media redundancy</b>			
- MRP	Yes	Yes	Yes
- MRPD	No	Yes	No
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
<b>Isochronous mode</b>			
Equidistance	No	Yes	Yes
shortest clock pulse		250 µs	250 µs
max. cycle		4 ms	4 ms
<b>Interrupts/diagnostics/ status information</b>			
Status indicator	Yes	Yes	Yes
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Connection display LINK TX/RX	Yes; 2x green-yellow LEDs	Yes; 2x green-yellow LEDs	Yes; 2x green-yellow LEDs
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-30 °C; From FS03	-25 °C; from FS04	-25 °C; From FS03
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS03	-25 °C; from FS04	-25 °C; From FS03
• vertical installation, max.	40 °C	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Connection method</b>			
<b>ET-Connection</b>			
• via BU/BA Send		No	No
<b>Dimensions</b>			
Width	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
<b>Weights</b>			
Weight, approx.	236 g	350 g	

### Overview



- Interface module for connecting ET 200MP to PROFIBUS
- Handles data exchange with the PROFIBUS master in the PLC
- Max. 12 I/O modules
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 125; adjustable using DIP switches
- Identification and maintenance data IMO ... IM3

Ordering data	Article No.	Ordering data	Article No.
<b>IM 155-5 DP ST interface module</b> IP20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail	6ES7155-5BA00-0AB0	<b>PROFIBUS FastConnect bus cable</b> • Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0EH10
<b>Accessories</b>		• 20 m	6XV1830-0EN20
<b>Front flap for IM 155-5 PN (spare part), 5 units</b>	6ES7528-0AA70-7AA0	• 50 m	6XV1830-0EN50
<b>SIMATIC S7-1500 mounting rail</b> Fixed lengths, with grounding elements		• 100 m	6XV1830-0ET10
• 160 mm	6ES7590-1AB60-0AA0	• 200 m	6XV1830-0ET20
• 245 mm	6ES7590-1AC40-0AA0	• 500 m	6XV1830-0ET50
• 482 mm	6ES7590-1AE80-0AA0	• 1000 m	6XV1830-0EU10
• 530 mm	6ES7590-1AF30-0AA0	<b>FC robust cable</b>	6XV1830-0JH10
• 830 mm	6ES7590-1AJ30-0AA0	Bus cable with PUR sheath for use under conditions of extreme mechanical stress or aggressive chemicals, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	
For cutting to length by customer, without drill holes; grounding elements must be ordered separately		<b>FC flexible cable</b>	6XV1831-2K
• 2 000 mm	6ES7590-1BC00-0AA0	PROFIBUS bus cable, flexible, with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	
<b>PE connection element for mounting rail 2 000 mm</b>	6ES7590-5AA00-0AA0	<b>FC trailing cable</b>	6XV1830-3EH10
20 units		PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	
<b>Load power supply</b>		<b>FC bus cable</b>	6XV1830-0GH10
24 V DC/3 A	6EP1332-4BA00	PROFIBUS Food bus cable with PE sheath for use in the food and beverages industry, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	
24 V DC/8 A	6EP1333-4BA00	<b>FC underground cable</b>	6XV1830-3FH10
<b>Power supply connector</b>		PROFIBUS underground cable, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	
Spare part; for connecting the 24 V DC supply voltage			
• With push-in terminals	6ES7193-4JB00-0AA0		
<b>PROFIBUS connector</b>			
• Connection plug for PROFIBUS, up to 12 Mbps, 90° cable outlet, insulation displacement method, without PG socket	6ES7972-0BA70-0XA0		
• Connection plug for PROFIBUS, up to 12 Mbps, 90° cable outlet, insulation displacement method, with PG socket	6ES7972-0BB70-0XA0		
<b>PROFIBUS stripping tool</b>	6GK1905-6AA00		
Stripping tool for fast stripping of the PROFIBUS			

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200MP**Interface modules > IM 155-5 DP**

Ordering data	Article No.	Ordering data	Article No.
<b>FC FRNC cable</b> PROFIBUS bus cable, flame-retardant and halogen-free, with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1830-0LH10</b>	<b>IE FC stripping tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
<b>FC trailing cable</b> PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1831-2L</b>		

**Technical specifications**

Article number	<b>6ES7155-5BA00-0AB0</b> ET 200MP, IM155-5 DP ST
<b>General information</b>	
Product type designation	IM 155-5 DP ST
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	No
• Isochronous mode	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
<b>Input current</b>	
Current consumption (rated value)	0.2 A; at 24 V DC and without load
<b>Address area</b>	
<b>Address space per station</b>	
• Address space per station, max.	244 byte; per input / output
<b>Hardware configuration</b>	
Integrated power supply	Yes
<b>Rack</b>	
• Modules per rack, max.	12; I/O modules
<b>Interfaces</b>	
Number of PROFIBUS interfaces	1
<b>1. Interface</b>	
<b>Interface types</b>	
• RS 485	Yes
<b>Protocols</b>	
• PROFIBUS DP slave	Yes
<b>RS 485</b>	
• Transmission rate, max.	12 Mbit/s
<b>Open IE communication</b>	
• TCP/IP	No
<b>PROFIBUS DP</b>	
<b>Services</b>	
- SYNC capability	Yes
- FREEZE capability	Yes
- DPV1	Yes

Article number	<b>6ES7155-5BA00-0AB0</b> ET 200MP, IM155-5 DP ST
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Connection display DP	Yes; green LED
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C; from FS04
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; from FS04
• vertical installation, max.	40 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Connection method</b>	
<b>ET-Connection</b>	
• via BU/BA Send	No
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	360 g



## Overview



- Interface module for linking the ET 200MP to PROFINET
- Handles data exchange with the PROFINET I/O controller in the PLC
- Integrated 2-port switch for line topology
- Max. 30 I/O modules
- Shortest bus cycle 250 µs
- Linking to the isochronous task of the CPU
- Prioritized fast startup (FSU) with 500 ms (max. 12 I/O modules)
- Media Redundancy Protocol (MRP)
- Shared device on up to 2 I/O controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC Memory Card (SMC); IM replacement without PG using LLDP

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

## Ordering data

**SIPLUS IM 155-5 PN interface module**

(Extended temperature range and exposure to environmental substances)

IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail

IM 155-5 PN ST, standard version

IM 155-5 PN HF, High Feature version with additional functions

**Accessories**

## Article No.

**6AG1155-5AA01-7AB0**

**6AG1155-5AA00-2AC0**

See SIMATIC ET 200MP, IM 155-5 PN interface module, page 10/302

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200MP

## Interface modules &gt; SIPLUS IM 155-5 PN

**Technical specifications**

Article number	<b>6AG1155-5AA01-7AB0</b>	<b>6AG1155-5AA00-2AC0</b>
Based on	<b>6ES7155-5AA01-0AB0</b> SIPLUS ET 200MP IM 155-5 PN ST	<b>6ES7155-5AA00-0AC0</b> SIPLUS ET 200MP IM155-5 PN HF
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax; ab > +60 °C no module permissible left of the IM -40 °C; = Tmin 40 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); from 2 000 m max. 132 V AC	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Coolants and lubricants</b>		
<ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>		
<ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

## Overview



- Interface module for linking the ET 200MP to PROFIBUS
- Handles data exchange with the PROFIBUS master in the PLC
- Max. 12 I/O modules
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 125; adjustable using DIP switches
- Identification and maintenance data IM0 ... IM3

## Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Ordering data

Ordering data	Article No.
<b>SIPLUS IM 155-5 DP ST interface module</b> (Extended temperature range and exposure to environmental substances) IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail	<b>6AG1155-5BA00-2AB0</b>
<b>Accessories</b>	See SIMATIC ET 200MP, IM 155-5 DP interface module, page 10/305

## Technical specifications

Article number	<b>6AG1155-5BA00-2AB0</b>
Based on	<b>6ES7155-5BA00-0AB0</b> SIPLUS ET 200MP IM155-5 DP ST
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax

Article number	<b>6AG1155-5BA00-2AB0</b>
Based on	<b>6ES7155-5BA00-0AB0</b> SIPLUS ET 200MP IM155-5 DP ST
<b>Altitude during operation relating to sea level</b>	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200MP

### I/O modules

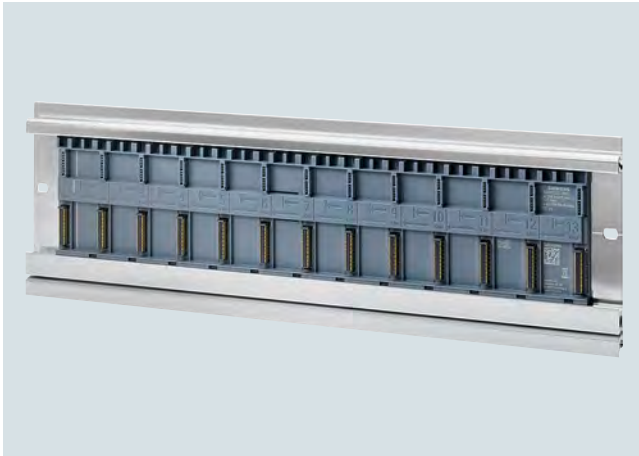
#### Overview



I/O modules constitute the interface of SIMATIC ET 200MP to the process:

- Digital and analog modules provide exactly the inputs/outputs required for each task
- Technology modules for SIMATIC S7-1500 and ET 200MP
  - With integrated functions for high-speed counting and position detection
  - With integrated inputs and outputs for tasks at the process level and short response times
- Communications modules for SIMATIC S7-1500 and ET 200MP
  - For data exchange using point-to-point coupling
  - For connecting to PROFIBUS
  - For connecting to Industrial Ethernet
- Connection system for user-friendly, low-overhead wiring of the S7-1500 and ET 200MP modules

You can find additional information under [SIMATIC S7-1500, catalog section 4](#).

**Overview**

Active backplane bus in S7-1500 DIN rail

- Considerably enhances system availability:
  - Reaction-free hot swapping of I/O modules during operation; system remains in RUN mode when replacing one or more I/O modules
  - Reserve capacity (= gaps in system configuration) for later use
- Can also be used exclusively with ET200MP and PROFINET
- Can be inserted in the ET 200MP standard mounting rail, replaces the U connectors
- The comprehensive system functions of ET 200 MP can still all be used
- Can be used with all PROFINET IO controllers by configuring via GSD file and PROFINET

**Ordering data****Article No.****Active backplane bus**

With 12 slots for ET 200MP I/O modules for hot swapping; for insertion in the S7-1500 DIN rail.

Please order the S7-1500 DIN rail and slot covers separately.

- 4 slots
- 8 slots:
- 12 slots

**6ES7590-0BD00-0AA0**  
**6ES7590-0BH00-0AA0**  
**6ES7590-0BL00-0AA0**

**Accessories****Slot cover for active backplane bus**

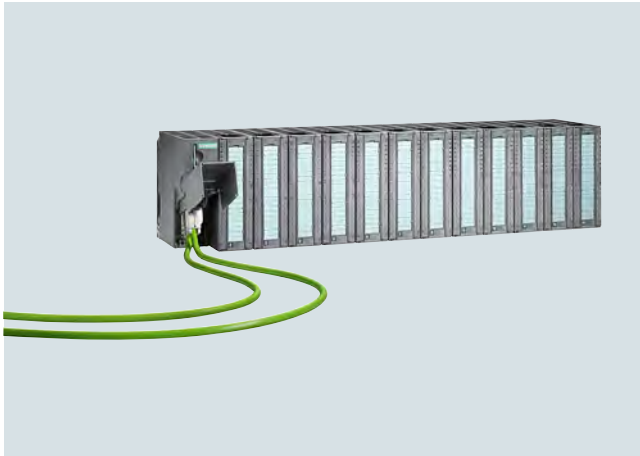
To protect against electrostatic discharge as well as provide mechanical stability on the S7-1500 DIN rail; 5 units per packing unit

**6ES7590-0CA00-0AA0**

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200MP**Active backplane bus****Technical specifications**

Article number	<b>6ES7590-0BD00-0AA0</b> SIMATIC S7-1500 active backplane/4 slot	<b>6ES7590-0BH00-0AA0</b> SIMATIC S7-1500 act. backplane / 8 slot	<b>6ES7590-0BL00-0AA0</b> SIMATIC S7-1500 act. backplane/ 12 slot
<b>General information</b>			
Product type designation	Active Backplane ST 1+4 Slot	Active Backplane ST 1+8 Slot	Active backplane ST 1+12 slot
<b>Product function</b>			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	Yes	Yes	Yes
• Prioritized startup	Yes	Yes	Yes
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/ integrated from version	V16	V16	V16
• STEP 7 configurable/integrated from version	V5.6 and higher	V5.6 and higher	V5.6 and higher
• PROFINET from GSD version/ GSD revision	V2.35 / -	V2.35 / -	V2.34 / -
<b>Hardware configuration</b>			
<b>Slots</b>			
• Grid size	35 mm; Utilization of 25 mm-wide modules possible	35 mm; Utilization of 25 mm-wide modules possible	35 mm; Utilization of 25 mm-wide modules possible
• Number of slots	5	9	13
- of which for CPU, max.	0	0	0
- of which for IM, max.	1	1	1
- of which for PS, max.	2; Max. 2 PS per station	2; Max. 2 PS per station	12; Max. 2 PS per station
- of which for IO/CM/CP/TM, max.	4	8	12
- of which for F-IO, max.	4	8	12
• Number of single-width slots, max.	4	8	12
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• horizontal installation, min.	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>			
Width	154 mm	294 mm	434 mm
Height	99 mm	99 mm	99 mm
Depth	14 mm	14 mm	14 mm
<b>Weights</b>			
Weight, approx.	127 g	245 g	352 g

## Overview



- Modular I/O system with IP20 degree of protection, particularly suitable for user-specific and complex automation tasks
- Consists of a PROFIBUS DP or PROFINET interface module IM 153, up to 8 or 12 I/O modules of the S7-300 automation system (structure with bus connection or with active bus modules), and a power supply if applicable
- Can be expanded with S7-300 automation system signal, communication and function modules
- Applicable Ex analog input or output modules with HART optimize the ET 200M for use in process engineering
- Can be used in redundant systems (S7-400H, S7-400F/FH)
- Modules can be replaced during operation (hot swapping) with the bus modules active
- Transmission rates up to 12 Mbps
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX 100 a
- Fail-safe digital in/outputs as well as analog inputs for safety-oriented signal processing in accordance with PROFIsafe
- Supports modules with expanded user data, e.g. HART modules with HART minor variables

### Availability

As part of our established product portfolio, the SIMATIC S7-300 / ET 200M system families will generally be available until 2023. Following the product phase-out declaration, products will be available as spare parts for another ten years.

## Technical specifications

### General technical data ET 200M

Cables and connections	Screw and spring-loaded connections in permanent wiring
Degree of protection	IP20
Ambient temperature on vertical wall (preferred mounting position)	
• with horizontal assembly	0 to +60 °C
• with other assembly	0 to +40 °C
Relative humidity	5 to 95% (RH stress level 2 according to IEC 1131-2)
Atmospheric pressure	795 to 1080 hPa
Mechanical stress	
• Vibrations	IEC 68, parts 2 – 6: 10 - 57 Hz (const. amplitude 0.075 mm) 57 - 150 Hz (constant acceleration 1 g)
• Shock	IEC 68, parts 2 – 27 half-sine, 15 g, 11 ms

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

**Interface modules > IM 153-1/153-2****Overview**

The ET 200M system with various interface modules is available for the distributed use of S7-300 I/O modules. Depending on the application purpose, the best suited IM in terms of costs and functions can be selected:

**IM153-1 Standard**

The IM153-1 is one reasonably priced variant that is excellently suited for most applications in the manufacturing environment. It permits the use of up to 8 S7-300 I/O modules.

**IM153-2 High Feature**

For higher requirements in manufacturing technology, such as the use of F technology or the highest performance in conjunction with clock synchronization, the IM153-2 High Feature is available. This IM is also designed for use with the PCS7 in the field of process-oriented applications. This IM can be redundantly used and supports typical functions as they are required in the control field. These include, for example, clock synchronization or time stamping with an accuracy of up to 1 ms.

**Ordering data****Article No.****IM 153-1 interface module**

Slave interface for connecting an ET 200M to PROFIBUS DP

- Standard temperature range

**6ES7153-1AA03-0XB0****IM 153-2 interface module**

Slave interface for connecting an ET 200M to PROFIBUS DP; also for use in redundant systems

- High Feature
- High Feature with extended temperature range

**6ES7153-2BA10-0XB0**  
**6ES7153-2BA70-0XB0**
**Active IM 153/IM 153 bus module**

For two IM 153-2 High Feature modules for designing redundant systems

**6ES7195-7HD10-0XA0****Bus module for ET 200M**

- For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover
- For accommodating two 40 mm-wide I/O modules for the hot-swapping function
- For accommodating one 80 mm-wide I/O module for the hot-swapping function

**6ES7195-7HA00-0XA0**  
**6ES7195-7HB00-0XA0**  
**6ES7195-7HC00-0XA0**
**ET 200M redundancy bundle**

Comprising two IM 153-2 High Feature modules and one IM 153/IM 153 bus module

**6ES7153-2AR04-0XA0****Article No.****Accessories****PROFIBUS bus connector**

90° outgoing cable, terminating resistor with disconnecting function, up to 12 Mbps, FastConnect

Without PG interface

- 1 unit
- 100 units

**6ES7972-0BA52-0XA0**  
**6ES7972-0BA52-0XB0**

With PG interface

- 1 unit
- 100 units

**6ES7972-0BB52-0XA0**  
**6ES7972-0BB52-0XB0**
**SIMATIC DP DIN rail for ET 200M**

Accommodates up to 5 bus modules; for hot-swapping function

- Length: 483 mm (19")
- Length: 530 mm
- Length: 620 mm
- Length: 2000 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0**  
**6ES7195-1GG30-0XA0**  
**6ES7195-1GC00-0XA0**
**SIMATIC S7-300 DIN rail**

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

**6ES7390-1AB60-0AA0**  
**6ES7390-1AE80-0AA0**  
**6ES7390-1AF30-0AA0**  
**6ES7390-1AJ30-0AA0**  
**6ES7390-1BC00-0AA0**
**S7 Manual Collection****6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:  
S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)

**S7 Manual Collection update service for 1 year****6ES7998-8XC01-8YE2**

Scope of delivery:  
Current DVD "S7 Manual Collection" and the three subsequent updates



**Technical specifications**

Article number	<b>6ES7153-1AA03-0XB0</b> ET200M, Interface Module IM153-1	<b>6ES7153-2BA10-0XB0</b> ET200M, Interface IM153-2 HF	<b>6ES7153-2BA70-0XB0</b> ET200M, INTERFACE IM153-2 HF OUTDOOR
<b>General information</b>			
Product type designation	IM 153-1 DP ST	IM 153-2 DP HF	IM 153-2 HF
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
external protection for power supply lines (recommendation)	not necessary		
<b>Input current</b>			
Current consumption, max.	350 mA; At 24 V DC	650 mA; with 24 V DC supply	650 mA
<b>Output voltage</b>			
Rated value (DC)	5 V		
<b>Output current</b>			
for backplane bus (5 V DC), max.	1 A	1.5 A	1.5 A
<b>Power loss</b>			
Power loss, typ.	3 W	5.5 W	5.5 W
<b>Address area</b>			
<b>Addressing volume</b>			
• Inputs	128 byte	244 byte	244 byte
• Outputs	128 byte	244 byte	244 byte
<b>Hardware configuration</b>			
Number of modules per DP slave interface, max.	8	12	12
<b>Time stamping</b>			
Accuracy		1 ms; 1 ms at up to 8 modules; 10 ms at up to 12 modules	1 ms; 1 ms at up to 8 modules; 10 ms at up to 12 modules
Number of message buffers		15	15
Messages per message buffer		20	20
Number of stampable digital inputs, max.		128; Max. 128 signals/station; max. 32 signals/slot	128; Max. 128 signals/station; max. 32 signals/slot
Time format		RFC 1119	RFC 1119
Time resolution		0.466 ns	0.466 ns
Time interval for transmitting the message buffer if a message is present		1 000 ms	1 000 ms
Time stamp on signal change		rising / falling edge as signal entering or exiting	rising / falling edge as signal entering or exiting
<b>Interfaces</b>			
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
<b>1. Interface</b>			
automatic detection of transmission rate	Yes	Yes	Yes
<b>Interface types</b>			
• Output current of the interface, max.	90 mA	70 mA	70 mA
• Design of the connection	9-pin sub D socket	9-pin sub D socket	9-pin sub D socket
<b>PROFIBUS DP slave</b>			
• GSD file	(for DPV1) SIEM801D.GSD; SI01801D.GSG	SI05801E.GSG	SI05801E.GSG
• automatic baud rate search	Yes	Yes	Yes
<b>Protocols</b>			
Bus protocol/transmission protocol	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170
<b>Protocols (Ethernet)</b>			
• TCP/IP	No	No	
<b>PROFIBUS DP</b>			
• Number of node addresses, max.	1 to 125 permitted	1 to 125 permitted	1 to 125 permitted
<b>Services</b>			
- SYNC capability	Yes	Yes	Yes
- FREEZE capability	Yes	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes; Sender	Yes; as publisher with all IO, as subscriber with F-IO only	Yes; as publisher with all IO, as subscriber with F-IO only

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M**Interface modules > IM 153-1/153-2****Technical specifications**

Article number	<b>6ES7153-1AA03-0XB0</b> ET200M, Interface Module IM153-1	<b>6ES7153-2BA10-0XB0</b> ET200M, Interface IM153-2 HF	<b>6ES7153-2BA70-0XB0</b> ET200M, INTERFACE IM153-2 HF OUTDOOR
<b>Potential separation</b>			
Potential separation exists	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	
• max.	60 °C	60 °C	
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	3 000 m	3 000 m	3 000 m
<b>Configuration</b>			
<b>Configuration software</b>			
• STEP 7	STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm
<b>Weights</b>			
Weight, approx.	360 g	360 g	360 g
Article number	<b>6ES7195-7HD10-0XA0</b> ET200M, Bus Unit f. 2 IM 153-2 red.		
<b>Dimensions</b>			
Width	97 mm		
Height	92 mm		
Depth	30 mm		
<b>Weights</b>			
Weight, approx.	133 g		
Article number	<b>6ES7195-7HA00-0XA0</b> ET200M, Bus Unit f. PS and IM 153	<b>6ES7195-7HB00-0XA0</b> ET200M, Bus Unit f. 2 40mm I/O Modules	<b>6ES7195-7HC00-0XA0</b> ET200M, Bus Unit f. 1 80mm I/O Module
<b>Dimensions</b>			
Width	97 mm	97 mm; 80 mm when installed	97 mm; 80 mm when installed
Height	92 mm	92 mm	92 mm
Depth	30 mm	30 mm	30 mm
<b>Weights</b>			
Weight, approx.	111 g	140 g	127 g

## Overview



- For connecting ET 200M to PROFINET IO (via copper line, RJ45) as an IO device
- 2 versions:
  - IM 153-4 PN STANDARD
  - IM 153-4 PN HIGH FEATURE: supports, in contrast to the STANDARD version, the operation of PROFIsafe F and HART modules. The operation of an S7-400H high availability PLC (system redundancy) is also possible.
- Integrated 2-port switch
- 12 modules per station
- Usable I/O capacity: 192 bytes each
- Active bus backplane to hot-swap modules available as an option
- Baud rate 10 Mbps / 100 Mbps (autonegotiation / full duplex)
- I&M functions according to PNO Guideline Order No. 3.502, Version V1.1

## Note:

Micro Memory Card with at least 64 KB required if not all the stations in the network support LLDP (Link Layer Discovery Protocol; proximity detection).

## Ordering data

## IM 153-4 PN interface module

I/O device to connect an ET 200M to PROFINET

Standard

6ES7153-4AA01-0XB0

High Feature

6ES7153-4BA00-0XB0

## Accessories

## Bus modules for ET 200M

- For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover
- For accommodating two 40 mm-wide I/O modules for the hot-swapping function
- For accommodating one 80 mm-wide I/O module for the hot-swapping function

6ES7195-7HA00-0XA0

6ES7195-7HB00-0XA0

6ES7195-7HC00-0XA0

## SIMATIC Micro Memory Card

64 KB<sup>1)</sup>

6ES7953-8LF31-0AA0

## SIMATIC DP mounting rail for ET 200M

Accommodates bus modules; for hot-swapping function

- Length: 483 mm (19")
- Length: 530 mm
- Length: 620 mm
- Length: 2 000 mm

6ES7195-1GA00-0XA0

6ES7195-1GF30-0XA0

6ES7195-1GG30-0XA0

6ES7195-1GC00-0XA0

## SIMATIC S7-300 mounting rail

Length: 160 mm

6ES7390-1AB60-0AA0

Length: 480 mm (19")

6ES7390-1AE80-0AA0

Length: 530 mm

6ES7390-1AF30-0AA0

Length: 830 mm

6ES7390-1AJ30-0AA0

Length: 2000 mm

6ES7390-1BC00-0AA0

## Power supply connector

For connection of the 24 V DC supply voltage; spare part, 1 pack containing 10 units

Spring-loaded connections

6ES7193-4JB00-0AA0

Screw terminal connections

6ES7193-4JB50-0AA0

## S7 Manual Collection

Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)

6ES7998-8XC01-8YE0

## S7 Manual Collection update service for 1 year

Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

6ES7998-8XC01-8YE2

## Industrial Ethernet FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

1 unit

6GK1901-1BB10-2AA0

10 units

6GK1901-1BB10-2AB0

50 units

6GK1901-1BB10-2AE0

## Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10

6XV1840-3AH10

6XV1840-4AH10

## Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

<sup>1)</sup> To operate the IM153-4, an MMC is required with at least 64 KB memory. Cards with higher memory capacity may also be used.

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M**Interface modules > IM 153-4 PN****Technical specifications**

Article number	<b>6ES7153-4AA01-0XB0</b> IM153-4 PN IO for 12 Modules S7-300	<b>6ES7153-4BA00-0XB0</b> IM153-4 PN IO HF for 12 Modules S7-300
<b>General information</b>		
Product type designation	IM 153-4 PN ST	IM 153-4 PN HF
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
external protection for power supply lines (recommendation)	In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A)	In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A)
<b>Input current</b>		
Current consumption, max.	600 mA; with 24 V DC supply	600 mA; with 24 V DC supply
<b>Output voltage</b>		
Rated value (DC)	5 V	5 V
<b>Output current</b>		
for backplane bus (5 V DC), max.	1.5 A	1.5 A
<b>Power loss</b>		
Power loss, typ.	6 W	6 W
<b>Address area</b>		
<b>Addressing volume</b>		
• Inputs	192 byte	672 byte; Extended HART user data
• Outputs	192 byte	192 byte
<b>Hardware configuration</b>		
Number of modules per DP slave interface, max.	12	12
<b>Protocols</b>		
Bus protocol/transmission protocol	PROFINET IO	PROFINET IO
<b>Protocols (Ethernet)</b>		
• TCP/IP	No	Yes
• SNMP		Yes
• LLDP		Yes
• ping		Yes
• ARP		Yes
<b>PROFINET IO Device Services</b>		
- IRT		Yes
- PROFINET energy		No
- Prioritized startup		Yes
- Shared device		Yes
- Number of IO Controllers with shared device, max.		2
<b>Redundancy mode</b>		
• PROFINET system redundancy (S2)	No	Yes
<b>Media redundancy</b>		
- MRP	Yes	Yes
<b>Interrupts/diagnostics/status information</b>		
<b>Diagnostics indication LED</b>		
• LINK LED	Yes; green LED	Yes; green LED
• RX/TX LED	Yes; Yellow LED	Yes; Yellow LED
• for module diagnostics	Yes	Yes
<b>Potential separation</b>		
Potential separation exists	Yes	Yes; Only direction PROFINET, RWB is not separated

**Technical specifications**

Article number	<b>6ES7153-4AA01-0XB0</b> IM153-4 PN IO for 12 Modules S7-300	<b>6ES7153-4BA00-0XB0</b> IM153-4 PN IO HF for 12 Modules S7-300
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	0 °C	0 °C
• max.	60 °C	60 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	2 000 m
<b>Dimensions</b>		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	118 mm	118 mm
<b>Weights</b>		
Weight, approx.	215 g	215 g

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

Interface modules > SIPLUS ET 200M IM 153-1/153-2

**Overview****Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**Ordering data****Article No.****Article No.****SIPLUS ET 200M IM 153-1**

Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 8 S7-300 modules

- Extended temperature range and exposure to environmental substances

**6AG1153-1AA03-2XB0**

**SIPLUS ET 200M IM 153-2 High Feature**

Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 12 S7-300 modules; also for use in redundant systems

- Extended temperature range and exposure to environmental substances

**6AG1153-2BA10-7XB0**

**Bus module for SIPLUS ET 200M**

Bus module for accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover

- Extended temperature range and exposure to environmental substances

**6AG1195-7HA00-2XA0**

Bus module for accommodating two 40 mm-wide I/O modules for the hot-swapping function

- Extended temperature range and exposure to environmental substances

**6AG1195-7HB00-7XA0**

Bus module for accommodating one 80 mm-wide I/O module for the hot-swapping function

- Extended temperature range and exposure to environmental substances

**6AG1195-7HC00-2XA0**

Bus module for accommodating two IM 153 modules for the hot-swapping function; for setting up redundant systems

- Extended temperature range and exposure to environmental substances

**6AG1195-7HD10-2XA0**

**RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbps

Extended temperature range and exposure to environmental substances

- Without PG interface
- With PG interface

**6AG1972-0BA12-2XA0**  
**6AG1972-0BB12-2XA0**

**Other accessories**

see SIMATIC ET 200M IM 153-1/153-2, page 10/314

**Technical specifications**

Article number	<b>6AG1153-1AA03-2XB0</b>	<b>6AG1153-2BA10-7XB0</b>
Based on	<b>6ES7153-1AA03-0XB0</b> SIPLUS IM153-1	<b>6ES7153-2BA10-0XB0</b> SIPLUS ET200M IM153-2 HF
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax
• At cold restart, min.	-25 °C	-25 °C
<b>Ambient temperature during storage/transportation</b>		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C

## Technical specifications

Article number	<b>6AG1153-1AA03-2XB0</b>	<b>6AG1153-2BA10-7XB0</b>
Based on	<b>6ES7153-1AA03-0XB0</b> SIPLUS IM153-1	<b>6ES7153-2BA10-0XB0</b> SIPLUS ET200M IM153-2 HF
<b>Altitude during operation relating to sea level</b>		
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>		
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
<ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
<ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene)  Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
<ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Article number	<b>6AG1195-7HA00-2XA0</b>	<b>6AG1195-7HB00-7XA0</b>	<b>6AG1195-7HC00-2XA0</b>	<b>6AG1195-7HD10-2XA0</b>
Based on	<b>6ES7195-7HA00-0XA0</b> SIPLUS ET200M DP Busmodul	<b>6ES7195-7HB00-0XA0</b> SIPLUS DP Busmodul ET200M 2X40	<b>6ES7195-7HC00-0XA0</b> SIPLUS ET200M Busmodul	<b>6ES7195-7HD10-0XA0</b> SIPLUS_ET200M_DP_Busmodul
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-40 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	-40 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	-40 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	-40 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Ambient temperature during storage/transportation</b>				
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-40 °C 70 °C	-40 °C 70 °C	-40 °C 70 °C	-40 °C 70 °C
<b>Altitude during operation relating to sea level</b>				
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	5 000 m  Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

Interface modules &gt; SIPLUS ET 200M IM 153-1/153-2

**Technical specifications**

Article number	<b>6AG1195-7HA00-2XA0</b>	<b>6AG1195-7HB00-7XA0</b>	<b>6AG1195-7HC00-2XA0</b>	<b>6AG1195-7HD10-2XA0</b>
Based on	<b>6ES7195-7HA00-0XA0</b> SIPLUS ET200M DP Busmodul	<b>6ES7195-7HB00-0XA0</b> SIPLUS DP Busmodul ET200M 2X40	<b>6ES7195-7HC00-0XA0</b> SIPLUS ET200M Busmodul	<b>6ES7195-7HD10-0XA0</b> SIPLUS_ET200M_DP_Bus- modul
<b>Relative humidity</b>				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<b>Use in stationary industrial systems</b>				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!



## Overview



- Integrated 2-port switch
- 12 modules per station
- Usable I/O quantity structure: 192 bytes each
- Active backplane bus for hot swapping of modules optionally available
- Baud rate 10 Mbps / 100 Mbps (Autonegotiation/Full Duplex)
- I&M functions according to PNO Guideline Order-No. 3.502, Version V1.1

**Notes:**

Micro Memory Card with min. 64 KB required if not all participants in the network support LLDP (Link Layer Discovery Protocol; neighbor detection).

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

- For connection of ET 200M as IO device to PROFINET IO (via copper, RJ45)
- 2 versions:
  - IM 153-4 PN STANDARD
  - IM 153-4 PN HIGH FEATURE: additionally to the STANDARD version, operation of PROFI-safe F and HART modules

## Ordering data

## Article No.

## Article No.

**SIPLUS ET 200M IM 153-4 PN**

(Extended temperature range and exposure to environmental substances)

Slave interface module for connecting an ET 200M to PROFINET for a maximum of 12 S7-300 modules

- Standard
- High Feature

**6AG1153-4AA01-7XB0**  
**6AG1153-4BA00-7XB0**

**Accessories****IE FC RJ45 plug 180**

180° cable outlet; 1 unit

**6AG1901-1BB10-7AA0**

**Other accessories**

See SIMATIC ET 200M IM 153-4 PN interface module, page 10/317

## Technical specifications

Article number	<b>6AG1153-4AA01-7XB0</b>	<b>6AG1153-4BA00-7XB0</b>
Based on	<b>6ES7153-4AA01-0XB0</b> SIPLUS ET200M IM 153-4 PN IO	<b>6ES7153-4BA00-0XB0</b> SIPLUS ET200M IM153-4 PN IO HF
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; Tmax > 60 °C output current for backplane bus (5 V DC) max. 0.9 A
• At cold restart, min.		-25 °C
<b>Ambient temperature during storage/transportation</b>		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

Interface modules &gt; SIPLUS ET 200M IM 153-4 PN IO

**Technical specifications**

Article number	<b>6AG1153-4AA01-7XB0</b>	<b>6AG1153-4BA00-7XB0</b>
Based on	<b>6ES7153-4AA01-0XB0</b> SIPLUS ET200M IM 153-4 PN IO	<b>6ES7153-4BA00-0XB0</b> SIPLUS ET200M IM153-4 PN IO HF
<b>Relative humidity</b> • With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
<b>Use in stationary industrial systems</b>		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

**Overview digital modules**

- Digital inputs and outputs
- For flexible adaptation of the controller to the respective task
- For connecting digital sensors and actuators

For further information, see SIMATIC S7-300, chapter 5.

**Overview analog modules**

- Analog inputs and outputs
- For solving even complex tasks with analog process signals
- For connecting analog actuators and sensors without additional measuring amplifiers

For further information, see SIMATIC S7-300, chapter 5.

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

I/O modules > Analog modules with HART > Analog input module with HART

### Overview



- Can only be plugged into ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundancy switching
- Firmware update
- HART minor variables

### Ordering data

#### SM 331 HART analog input module

8 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module

#### Accessories

##### Front connectors

- 20-pin, with screw contacts
  - 1 unit
  - 100 units
- 20-pin, with spring-loaded contacts
  - 1 unit
  - 100 units

##### LK 393 cable guide

Mandatory for operation in hazardous areas

##### SIMATIC DP mounting rail for ET 200M

For mounting of up to 5 bus modules for

- Length: 483 mm (19")
- Length: 530 mm

### Article No.

6ES7331-7TF01-0AB0

6ES7392-1AJ00-0AA0  
6ES7392-1AJ00-1AB0

6ES7392-1BJ00-0AA0  
6ES7392-1BJ00-1AB0

6ES7393-4AA00-0AA0

6ES7195-1GA00-0XA0  
6ES7195-1GF30-0XA0

### Article No.

#### SIMATIC S7-300 mounting rail

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

#### Label cover

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

#### Labeling strips

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

#### Labeling sheets for machine printing

For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

Petrol  
Light beige  
Yellow  
Red

6ES7390-1AB60-0AA0  
6ES7390-1AE80-0AA0  
6ES7390-1AF30-0AA0  
6ES7390-1AJ30-0AA0  
6ES7390-1BC00-0AA0

6ES7392-2XY00-0AA0

6ES7392-2XX00-0AA0

6ES7392-2AX00-0AA0  
6ES7392-2BX00-0AA0  
6ES7392-2CX00-0AA0  
6ES7392-2DX00-0AA0

## Technical specifications

Article number	<b>6ES7331-7TF01-0AB0</b> SM331, 8AI, 0/4-20MA HART
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	20 mA
from backplane bus 5 V DC, max.	120 mA
<b>Output voltage</b>	
<b>Power supply to the transmitters</b>	
• present	Yes
• Rated value (DC)	24 V
• short-circuit proof	Yes
• Supply current, max.	60 mA
<b>Power loss</b>	
Power loss, typ.	1.5 W
<b>Analog inputs</b>	
Number of analog inputs	8
permissible input current for current input (destruction limit), max.	40 mA
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
<b>Cable length</b>	
• shielded, max.	800 m
<b>Analog value generation for the inputs</b>	
Measurement principle	Sigma Delta
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	20 ms at 50 Hz; 16.6 ms at 60 Hz; 100 ms at 100 Hz
• Basic conversion time, including integration time (ms)	55 ms @ 60 Hz, 65 ms @ 50 Hz, 305 ms @ 100 Hz
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 Hz
<b>Smoothing of measured values</b>	
• parameterizable	Yes

Article number	<b>6ES7331-7TF01-0AB0</b> SM331, 8AI, 0/4-20MA HART
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
• Current, relative to input range, (+/-)	0.15 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to input range, (+/-)	0.1 %
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	117 mm
<b>Weights</b>	
Weight, approx.	205 g

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

I/O modules > Analog modules with HART > Analog output module with HART

**Overview**

- For plugging into ET 200M exclusively with IM 153-2 and IM 153-2 FO
- 8 AO HART
- Redundancy switching
- Firmware update
- HART minor variables

**Ordering data****Article No.****SM 332 HART analog output module**

HART analog output, 8 outputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2

**6ES7332-8TF01-0AB0****Accessories****Front connector** (1 unit)

20-pin, with screw contacts

**6ES7392-1AJ00-0AA0****LK 393 cable guide**

Mandatory for operation in hazardous areas

**6ES7393-4AA00-0AA0****SIMATIC DP DIN rail for ET 200M**

For mounting of up to 5 bus modules for

- Length: 483 mm (19")
- Length: 530 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0****SIMATIC S7-300 mounting rail**

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

**6ES7390-1AB60-0AA0**  
**6ES7390-1AE80-0AA0**  
**6ES7390-1AF30-0AA0**  
**6ES7390-1AJ30-0AA0**  
**6ES7390-1BC00-0AA0****Label cover**

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

**6ES7392-2XY00-0AA0****Labeling strips**

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

**6ES7392-2XX00-0AA0****Article No.****S7 Manual Collection**

Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)

**6ES7998-8XC01-8YE0****S7 Manual Collection update service for 1 year**

Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

**6ES7998-8XC01-8YE2****Labeling sheets for machine printing**

For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

Petrol

**6ES7392-2AX00-0AA0**

Light beige

**6ES7392-2BX00-0AA0**

Yellow

**6ES7392-2CX00-0AA0**

Red

**6ES7392-2DX00-0AA0**

#### Technical specifications

Article number	<b>6ES7332-8TF01-0AB0</b> SM332, 8AO, 0/4 - 20MA HART	
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	
<b>Input current</b>		
from load voltage L+ (without load), max.	350 mA	
from backplane bus 5 V DC, max.	110 mA	
<b>Power loss</b>		
Power loss, typ.	6 W	
<b>Analog outputs</b>		
Number of analog outputs	8	
Current output, no-load voltage, max.	24 V	
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	
• -20 mA to +20 mA	No	
• 4 mA to 20 mA	Yes	
<b>Connection of actuators</b>		
• for current output two-wire connection	Yes	
<b>Load impedance (in rated range of output)</b>		
• with current outputs, max.	750 Ω	
• with current outputs, inductive load, max.	10 mH	
<b>Cable length</b>		
• shielded, max.	800 m	
<b>Analog value generation for the outputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	16 bit	
• Basic execution time of the module (all channels released)	10 ms; 10 ms in AO mode 50 ms in HART-AO mode	
<b>Settling time</b>		
• for resistive load	0.1 ms	
• for inductive load	0.5 ms	

Article number	<b>6ES7332-8TF01-0AB0</b> SM332, 8AO, 0/4 - 20MA HART	
<b>Errors/accuracies</b>		
<b>Operational error limit in overall temperature range</b>		
• Current, relative to output range, (+/-)	0.2 %	
<b>Basic error limit (operational limit at 25 °C)</b>		
• Current, relative to output range, (+/-)	0.1 %	
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	
<b>Alarms</b>		
• Diagnostic alarm	Yes	
<b>Connection method</b>		
required front connector	20-pin	
<b>Dimensions</b>		
Width	40 mm	
Height	125 mm	
Depth	117 mm	
<b>Weights</b>		
Weight, approx.	220 g	

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

I/O modules > Analog modules with HART > Ex-analog input module with HART

### Overview



- For connecting HART devices in hazardous areas.
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable

### Ordering data

#### Article No.

#### SM 331 HART analog input module

2 inputs, 0/4 – 20 mA,  
HART for ET 200M with  
IM 153-2 interface module  
For HART protocol V5.0 and higher

**6ES7331-7TB10-0AB0**

#### Accessories

##### Front connector<sup>1)</sup>

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

##### LK 393 cable guide

Mandatory for operation  
in hazardous areas

**6ES7393-4AA00-0AA0**

##### SIMATIC DP mounting rail for ET 200M

For mounting of  
up to 5 bus modules for

- Length: 483 mm
- Length: 530 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0**

#### Article No.

##### SIMATIC S7-300 mounting rail

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

**6ES7390-1AB60-0AA0**  
**6ES7390-1AE80-0AA0**  
**6ES7390-1AF30-0AA0**  
**6ES7390-1AJ30-0AA0**  
**6ES7390-1BC00-0AA0**

##### Label cover

(10 units, spare part) for signal  
modules (not 32-channel modules),  
function modules and CPU 312 IFM

**6ES7392-2XY00-0AA0**

##### Labeling strips

(10 units, spare part) for signal  
modules (not 32-channel modules),  
function modules and CPU 312 IFM

**6ES7392-2XX00-0AA0**

##### Labeling sheets for machine printing

For modules with 20-pin front  
connector, DIN A4, for printing  
with laser printer; 10 units

Petrol

**6ES7392-2AX00-0AA0**

Light beige

**6ES7392-2BX00-0AA0**

Yellow

**6ES7392-2CX00-0AA0**

Red

**6ES7392-2DX00-0AA0**

<sup>1)</sup> A connector with spring-loaded terminals cannot be used if the cable guide is used.



### Technical specifications

Article number	<b>6ES7331-7TB10-0AB0</b> SIMATIC DP, HART ANALOG INPUT M
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	180 mA
from backplane bus 5 V DC, max.	100 mA
<b>Output voltage</b>	
<b>Power supply to the transmitters</b>	
• present	Yes
• Rated value (DC)	15 V; at 22 mA
• short-circuit proof	Yes; approx. 30 mA
• No-load voltage (DC)	29.6 V
<b>Power loss</b>	
Power loss, typ.	4.5 W
<b>Analog inputs</b>	
Number of analog inputs	2
permissible input current for current input (destruction limit), max.	40 mA
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Cable length</b>	
• shielded, max.	400 m
<b>Analog value generation for the inputs</b>	
Measurement principle	Sigma Delta
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit; 10 bit to 15 bit + sign
• Integration time, parameterizable	Yes
• Basic conversion time, including integration time (ms)	2.5 / 16.67 / 20 / 100 (1 channel enabled); 7.5 / 50 / 60 / 300 (2 channels enabled)
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

Article number	<b>6ES7331-7TB10-0AB0</b> SIMATIC DP, HART ANALOG INPUT M
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
• Current, relative to input range, (+/-)	0.45 %; From 0/4 to 20 mA
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to input range, (+/-)	0.1 %; From 0/4 to 20 mA
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes; Parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable, channels 0 and 1
<b>Ex(i) characteristics</b>	
Module for Ex(i) protection	Yes
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>o</sub> (no-load voltage), max.	26 V
• I <sub>o</sub> (short-circuit current), max.	96.1 mA
• P <sub>o</sub> (power output), max.	511 mW
• C <sub>o</sub> (permissible external capacity), max.	62 nF
• L <sub>o</sub> (permissible external inductivity), max.	3 mH
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	250 V; DC
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Connection method</b>	
required front connector	1x 20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	260 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

I/O modules > Analog modules with HART > Ex-analog output module with HART

### Overview



- For using HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AO HART, Ex
- 2 current outputs in 2 channel groups (single-channel isolation)
- Output type and range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable
- Read-back capability of the analog outputs

### Ordering data

#### SM 332 HART analog output module

HART analog output, 8 outputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2

For HART protocol V5.0 and higher

### Article No.

**6ES7332-5TB10-0AB0**

#### Accessories

##### Front connectors

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**

**6ES7392-1AJ00-1AB0**

##### LK 393 cable guide

**6ES7393-4AA00-0AA0**

Mandatory for operation in hazardous areas

#### SIMATIC DP mounting rail for ET 200M

For mounting of up to 5 bus modules for

- Length: 483 mm (19")
- Length: 530 mm

**6ES7195-1GA00-0XA0**

**6ES7195-1GF30-0XA0**

#### SIMATIC S7-300 mounting rail

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

**6ES7390-1AB60-0AA0**

**6ES7390-1AE80-0AA0**

**6ES7390-1AF30-0AA0**

**6ES7390-1AJ30-0AA0**

**6ES7390-1BC00-0AA0**

#### Label cover

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

**6ES7392-2XY00-0AA0**

### Article No.

#### Labeling strips

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

Software for machine labeling of modules directly from the STEP 7 project

**6ES7392-2XX00-0AA0**

#### Labeling sheets for machine printing

for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0**

#### S7 Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:  
S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)

#### S7 Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

## Technical specifications

Article number	<b>6ES7332-5TB10-0AB0</b> SIMATIC DP, HART ANALOG OUTPUT
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	150 mA
from backplane bus 5 V DC, max.	100 mA
<b>Power loss</b>	
Power loss, typ.	3.5 W
<b>Analog outputs</b>	
Number of analog outputs	2
Current output, no-load voltage, max.	19 V
Cycle time (all channels) max.	5 ms
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	No
• 4 mA to 20 mA	Yes
<b>Connection of actuators</b>	
• for current output two-wire connection	Yes
<b>Load impedance (in rated range of output)</b>	
• with current outputs, max.	650 Ω
• with current outputs, inductive load, max.	7.5 mH
<b>Cable length</b>	
• shielded, max.	400 m
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	12 bit; + sign
• Conversion time (per channel)	40 ms
<b>Settling time</b>	
• for resistive load	2.5 ms
• for capacitive load	4 ms
• for inductive load	2.5 ms

Article number	<b>6ES7332-5TB10-0AB0</b> SIMATIC DP, HART ANALOG OUTPUT
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
• Current, relative to output range, (+/-)	0.55 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to output range, (+/-)	0.15 %
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes; Parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Ex(i) characteristics</b>	
Module for Ex(i) protection	Yes
<b>maximum values for connecting terminals for gas group IIC</b>	
• U <sub>o</sub> (no-load voltage), max.	19 V
• I <sub>o</sub> (short-circuit current), max.	66 mA
• P <sub>o</sub> (power output), max.	506 mW
• C <sub>o</sub> (permissible external capacity), max.	230 nF
• L <sub>o</sub> (permissible external inductivity), max.	7.5 mH
• U <sub>m</sub> (voltage at non-intrinsically safe connecting terminals), max.	60 V; DC
<b>Standards, approvals, certificates</b>	
FM approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• max.	60 °C
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	290 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

### I/O modules > Analog modules with HART > SIPLUS S7-300 analog input module with HART

#### Overview



- Can only be plugged into ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundant connection
- Firmware update
- HART secondary variables

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

#### Ordering data

#### Article No.

##### SIPLUS SM 331 analog input module with HART

8 inputs, 0/4 – 20 mA,  
HART for ET 200M with  
IM 153-2 interface module

Extended temperature range and  
exposure to environmental  
substances

**6AG1331-7TF01-7AB0**

##### Accessories

See SIMATIC ET 200M  
analog input module  
with HART, page 10/326

#### Technical specifications

Article number	<b>6AG1331-7TF01-7AB0</b>
Based on	<b>6ES7331-7TF01-0AB0</b> SIPLUS SM331 AI 8 x 0/4...20mA HART
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

### Overview



- Can only be plugged onto ET 200M with IM 153-2 and IM 153-2 FO
- 8 AO HART
- Redundant connection
- Firmware update
- HART secondary variables

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

### Ordering data

### Article No.

#### SIPLUS SM 332 analog output module with HART

8 outputs, 0/4 ... 20 mA HART, for ET 200M with IM 153-2 interface module

Extended temperature range and exposure to environmental substances

**6AG1332-8TF01-2AB0**

### Accessories

See SIMATIC SM 332 analog output module with HART, page 10/328

### Technical specifications

Article number	<b>6AG1332-8TF01-2AB0</b>
Based on	<b>6ES7332-8TF01-0AB0</b> SIPLUS SM332 8AO HART
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1332-8TF01-2AB0</b>
Based on	<b>6ES7332-8TF01-0AB0</b> SIPLUS SM332 8AO HART
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

I/O modules > Analog modules with HART > SIPLUS S7-300 Ex analog input module with HART

### Overview



- For connecting HART devices in hazardous areas.
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Programmable diagnostics and diagnostic interrupt

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

### Ordering data

#### SIPLUS SM 331 Ex analog input module with HART

2 inputs, 0/4 ... 20 mA,  
HART for ET 200M with IM 153-2  
interface module

Extended temperature range  
and exposure to environmental  
substances

### Article No.

6AG1331-7TB00-7AB0

### Article No.

#### Accessories

See SIMATIC ET 200M  
EX-analog input module  
with HART, page 10/330

### Technical specifications

Article number	<b>6AG1331-7TB00-7AB0</b>
Based on	<b>6ES7331-7TB00-0AB0</b> SIPLUS S7-300 SM331 2AE HART
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1331-7TB00-7AB0</b>
Based on	<b>6ES7331-7TB00-0AB0</b> SIPLUS S7-300 SM331 2AE HART
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!

**Overview F-digital/analog modules**

The fail-safe SIMATIC S7 CPUs and the fail-safe signal modules of SIMATIC ET 200S, ET 200pro, ET 200eco and ET 200M have been specially developed for distributed, safety-related applications in production engineering. Thanks to the discreetly modular structure of the fail-safe I/Os, safety technology only has to be applied where actually required. The new system replaces conventional electromechanical components, such as:

- Freely programmable, safe linking of sensors to actuators
- Selective safe shutdown of actuators
- Mixed configuration of F-modules and standard modules in a station
- Single-bus concept; fail-safe signals and standard signals are transferred over a single bus medium (PROFIBUS DP, PROFINET)

**Totally Integrated Automation (TIA)**

Safety technology (Safety Integrated) is a component of Totally Integrated Automation which provides total integration of safety automation and standard automation (SIMATIC S7).

Whereas standard automation (classical PLCs) and safety automation (electromechanics) are still separate today, these two worlds are growing together into a uniform, integrated overall system.

Siemens can therefore present itself as a complete supplier for automation technology in which safety engineering is part of standard automation and system-wide integration exists.

For further information, see SIMATIC S7-300, chapter 5.

**Overview Ex modules**

- Input/output modules for applications in chemical plants with explosion hazards
- For connecting sensors and actuators from zones 1 and 2 of plants with explosion hazards
- Associated electrical equipment Ex [ib] [ibD] IIC
- For separating the non-intrinsically-safe electrical circuits of the automation system and the intrinsically-safe electrical circuits of the process

For further information, see SIMATIC S7-300, chapter 5.

**I/O systems**

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

**I/O modules > Function modules****Overview**

Function modules unburden the CPU of work-intensive tasks such as counting, positioning and controlling

Module spectrum

- Counter modules
- Positioning modules for rapid traverse and creep speed drives
- Positioning modules for stepper motors
- Positioning modules for servo motors
- Positioning and continuous path modules
- SSI position detection modules
- Electronic cam controllers
- High-speed Boolean processor
- Controller modules

<b>Function modules</b>	
Counting	FM 350-1 counter module
	FM 350-2 counter module
Positioning • of rapid traverse and creep speed drives	FM 351 positioning module
	FM 357-2 path and position control module <sup>1)</sup>
Position and path control	SM 338 POS input modules
SSI position detection	FM 352 electronic cam controller
Electronic cam control	FM 352-5 high-speed Boolean processor
High speed logic operation	FM 355 controller module
	FM 355-2 temperature controller module
Weighing and proportioning electronics	SIWAREX

<sup>1)</sup> Not for ET 200M



**Overview****Applicability with ET 200M distributed I/O device**

Almost all function modules can be used in the ET 200M distributed I/O device.  
In doing so, the following details must be observed:

		For plugging in behind IM 153-1 (6ES7153-1AA03-0XB0)		For plugging in behind IM 153-2 (6ES7153-2BA02-0XB0)		For plugging in behind IM 153-2 FO (6ES7153-2BB00-0XB0)		For plugging in behind IM 153-4 PN (6ES7153-4AA00-0XB0)
		configurable with						
Module	Article No.	STEP 7 <sup>1)</sup>	GSD <sup>2)</sup>	STEP 7 <sup>1)</sup>	GSD <sup>2)</sup>	STEP 7 <sup>1)</sup>	GSD <sup>2)</sup>	STEP 7 <sup>1)</sup>
FM 350-1 counter module	6ES7 350-1AH03-0AEO	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 350-2 counter module	6ES7 350-2AH01-0AEO	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 351 positioning module	6ES7 351-1AH01-0AEO	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 352 cam controller	6ES7 352-1AH02-0AEO	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 352-5 high-speed Boolean processor	6ES7 352-5AH00-0AEO	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input type="checkbox"/>
FM 352-5 high-speed Boolean processor	6ES7 352-5AH10-0AEO	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input type="checkbox"/>
FM 355 C controller module	6ES7 355-0VH10-0AEO	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355 S controller module	6ES7 355-1VH10-0AEO	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355-2 C temperature controller module	6ES7 355-2CH00-0AEO	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355-2 S temperature controller module	6ES7 355-2SH00-0AEO	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
SM 338 POS input module	6ES7 338-4BC01-0AB0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

configurable  
--: not configurable

- 1) Configuration using the meta-knowledge integrated into STEP 7 (in Hardware Catalog under PROFIBUS DP > ET 200M > IM 153-1 / IM 153-2 or PROFINET IO > I/O > ET 200M > IM153-4 PN).
- 2) Configuration using GSD file (after installation of the GSD file configurable from the Hardware Catalog under PROFIBUS DP > Additional field devices > I/O > ET200M). During configuration on the CP 342-5 as DP master, S5 (IM 308C) as DP master or external masters, the GSD file must be configured.
- 3) Visible and configurable only with the corresponding configuration package in STEP 7.

Note:

Position measurement systems and pre-assembled connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

<http://www.siemens.com/simatic-technology>

For further information, see SIMATIC S7-300, chapter 5.

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200M

I/O modules > Special modules, Communication, Power supplies

### Overview special modules



The special modules provide the user with functions for diagnostics, as well as commissioning.

For further information, see SIMATIC S7-300, chapter 5.

### Overview power supplies



- Load current supplies for S7-300/ET 200M
- For converting the line voltage to the required operating voltage (24 V DC)
- Output current 2 A, 5 A or 10 A

For further information, see SIMATIC S7-300, chapter 5.

### Overview communication



- Communication boards for data exchange using point-to-point coupling
- Communication board for the connection of identification systems

For further information, see SIMATIC S7-300, chapter 5.

## Overview



The ET 200iSP is a modular, intrinsically-safe I/O system with IP30 degree of protection which can be operated in gas and dust atmospheres at ambient temperatures from -20 to +70 °C. It is optimized for use with SIMATIC PCS 7 and SIMATIC S7, but can also be integrated in other systems such as SIMATIC S5 per GSD file.

In accordance with ATEX directive 2014/34/EU, the ET 200iSP remote I/O stations can be installed directly in Ex Zones 1, 2, 21 or 22 as well as in non-hazardous areas. The intrinsically-safe sensors, actuators and HART field devices can also be located in zone 0 or 20 if necessary.

The modular design of the ET 200iSP makes it possible to optimally adapt the remote I/O stations to the respective automation task through individual configuration and flexible expansion. To increase plant availability, the pressure-encapsulated power supply and the intrinsically-safe PROFIBUS DP connection (RS 485-IS) of the stations can also be of redundant design.

The modern architecture with hardwiring and automatic slot coding supports pre-wiring without the electronic modules, simple and reliable hot swapping of individual modules without a fire certificate as well as configuration in run (CiR).

In addition to analog and digital I/O modules for the automation of technological functions of the process (Basic Process Control), the range of electronic modules also includes fail-safe I/O modules for implementing safety applications. The various types of electronic module can be arranged mixed within a station. Comprehensive diagnostic options facilitate commissioning and troubleshooting.

## Technical specifications

ET 200iSP – general		
Degree of protection	IP30	
Ambient temperature	-20 ... +70 °C	
• Horizontal mounting position	-20 ... +70 °C	
• Other mounting positions	-20 ... +50 °C	
Loading of media	According to ISA-S71.04 severity level G1; G2; G3 (except for NH3, only level G2 in this case)	
EMC	Electromagnetic compatibility according to NE21	
Vibration resistance	0.5 g continuously, 1 g periodically	
<b>Approvals, standards</b>		
• ATEX	II 2 G (1) GD I M2 Zone 1 Zone 1 Class I, II, III	Ex de [ia/ib] IIC T4 Ex de [ia/ib] I Ex de [ia/ib] IIC T4 BR-Ex de [ia/ib] IIC T4 NI Division 2, Groups A, B, C, D, E, F, G T4 AIS Division 1, Groups A, B, C, D, E, F, G
• IECEX		
• INMETRO		
• cFMus		
• cULus	Class I Class I, II, III	Zone 1, AEx de [ia/ib] IIC T4 Division 2, Groups A, B, C, D, E, F, G T4 providing int. safe circuits for Division 1, Groups A, B, C, D, E, F, G
• NEPSI	Class I Ex de ib[ia] IIC T4 Ex de [ia/ib] IIC T4 EN 50170, Volume 2 IEC 61131, Part 2	Zone 1, AEx de [ia/ib] IIC T4
• PROFIBUS		
• IEC		
• CE		
• KCC		
• Marine approval	In accordance with ATEX directive 2014/34/EU, EMC Directive 2014/30/EU and LVD-guideline 2014/35/EU Korea Certification Classification companies	
	<ul style="list-style-type: none"> <li>• ABS (American Bureau of Shipping)</li> <li>• BV (Bureau Veritas)</li> <li>• DNV (Det Norske Veritas)</li> <li>• GL (Germanischer Lloyd)</li> <li>• LRS (Lloyds Register of Shipping)</li> <li>• Class NK (Nippon Kaiji Kyokai)</li> </ul>	

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP

### Power supply unit

#### Overview



An ET 200iSP power supply unit consists of a TM-PS terminal module (A or B) and a PS power supply module which is plugged onto this. Terminal modules and power supply modules can be ordered separately.

The power supply modules are suitable for both individual operation (standard) and redundant operation. Depending on the operating mode, they must be combined with the terminal modules as follows:

- Standard: 1 × PS on TM-PS-A UC
- Redundancy: 1 × PS on TM-PS-A UC (left) plus 1 × PS on TM-PS-B UC (right)

Power supply modules are available for supplies of 24 V DC and 120/230 V AC.

The operating state of the power supply modules is indicated by two LEDs on the IM 152 interface module (one for each module).

#### Ordering data

PS 24 V DC power supply module for ET 200iSP

Article No.

6ES7138-7EA01-0AA0

PS 120/230 V AC power supply module for ET 200iSP

Article No.

6ES7138-7EC00-0AA0

Article No.

TM-PS-A UC terminal module

For standard operation

Article No.

6ES7193-7DA20-0AA0

TM-PS-B UC terminal module

Additional terminal module for redundant operation

Article No.

6ES7193-7DB20-0AA0

#### Technical specifications

Article number	6ES7138-7EA01-0AA0	6ES7138-7EC00-0AA0
	ET200iSP, POWER SUPPLY MODULE	ET200iSP, POWER SUPPLY MOD. AC120/230V
<b>Supply voltage</b>		
Rated value (DC)	24 V	
Rated value (AC)		230 V; 120/230 V AC
Reverse polarity protection	Yes	
<b>Line frequency</b>		
• permissible range, lower limit		47 Hz
• permissible range, upper limit		63 Hz
<b>Input current</b>		
from supply voltage L+, max.	4 A	
from supply voltage L1, max.		1.04 A; at rated voltage 230 VAC: 0.45A at rated voltage 120 VAC:0.75A
<b>Interrupts/diagnostics/ status information</b>		
Status indicator	Yes	Yes
Alarms	No	No
<b>Diagnoses</b>		
• Diagnostic information readable	Yes; via IM 152	Yes; via IM 152
<b>Diagnostics indication LED</b>		
• Group error SF (red)	No	No
<b>Potential separation</b>		
primary/secondary	Yes	Yes
between supply voltage and electronics	Yes	No

#### Power supply unit

Article number	<b>6ES7138-7EA01-0AA0</b> ET200iSP, POWER SUPPLY MODULE	<b>6ES7138-7EC00-0AA0</b> ET200iSP, POWER SUPPLY MOD. AC120/230V
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
<b>Use in hazardous areas</b>		
• Type of protection acc. to EN 50020 (CENELEC)	Ex de [ib]IIC T4	Ex de [ib]IIC T4
• Type of protection acc. to KEMA	04 ATEX 2263	09 ATEX 0156
<b>Dimensions</b>		
Width	60 mm	60 mm
Height	190 mm	190 mm
Depth	136.5 mm	136.5 mm
<b>Weights</b>		
Weight, approx.	2 700 g	2 700 g
Article number	<b>6ES7193-7DA20-0AA0</b> ET200iSP, TERM.-MOD. TM-PS-A UC	<b>6ES7193-7DB20-0AA0</b> ET200iSP, TERM.-MOD. TM-PS-B UC
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
<b>Use in hazardous areas</b>		
• Test number KEMA	04 ATEX 2242	04 ATEX 2242
<b>Dimensions</b>		
Width	60 mm	60 mm
Height	190 mm	190 mm
Depth	52 mm	52 mm
<b>Weights</b>		
Weight, approx.	230 g	230 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP

### Interface module

#### Overview



The IM 152 interface module connects the ET 200iSP to the PROFIBUS DP with intrinsically-safe RS 485-iS transmission technology with transmission rates of up to 1.5 Mbps. A redundant connection is also possible. In this case the ET 200iSP is connected via two interface modules to two redundant PROFIBUS DP segments of a fault-tolerant automation system.

The IM 152 is plugged onto a special terminal module (to be ordered separately). The following terminal modules are available:

- TM-IM/IM terminal module for two interface modules (for redundant PROFIBUS DP connection)
- TM-IM/EM60 terminal module for one interface module and one watchdog, reserve or electronic module (except 2 DQ relay)
  - with blue screw-type or spring-loaded terminals for hazardous environments
  - with black screw-type terminals for non-hazardous environments

#### Tasks of the IM 152 interface module

- Connection of ET 200iSP to the intrinsically-safe PROFIBUS DP
- Autonomous communication with the host automation system
- Preparation of data for the fitted electronic modules
- Saving of parameters of the electronic modules
- Time stamping of digital process signals with an accuracy of 20 ms

The maximum address space of the interface module is 244 bytes for inputs, and 244 bytes for outputs.

Ordering data	Article No.	Article No.
<b>ET 200iSP interface module IM 152-1</b>	6ES7152-1AA00-0AB0	
<b>ET 200iSP terminal module TM-IM/EM60</b> For an IM 152 and a watchdog, reserve or electronics module (except 2 DO relay), including terminating module		
• For hazardous environments		
- TM-IM/EM60S (blue screw-type terminals)	6ES7193-7AA00-0AA0	
- TM-IM/EM60C (blue spring-loaded terminals)	6ES7193-7AA10-0AA0	
• For non-hazardous environments		
- TM-IM/EM60S (black screw-type terminals)	6ES7193-7AA20-0AA0	
<b>ET 200iSP terminal module TM-IM/IM</b> For two IM 152 modules (redundant operation), including terminating module	6ES7193-7AB00-0AA0	
<b>Accessories</b>		
<b>PROFIBUS connector with selectable terminating resistor</b> For connection of IM 152 to PROFIBUS DP with RS 485-iS transmission technology	6ES7972-0DA60-0XA0	
		<b>RS 485-iS coupler</b> Isolating transformer for connection of PROFIBUS DP segments with RS 485 and RS 485-iS transmission technologies
		6ES7972-0AC80-0XA0
		<b>Labeling sheet</b> DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronics modules and 20 strips each for IM 152
		• Petrol • Yellow
		6ES7193-7BH00-0AA0 6ES7193-7BB00-0AA0
		<b>Labels, inscribed</b> For slot numbering, label size H x W (in mm): 5 x 7
		• 204 labels, for slots 1 to 20
		• 204 labels, for slots 1 to 40
		• 136 labels, inscription in plain text
		8WA8361-0AB 8WA8361-0AC 8WA8348-0XA
		<b>Labels, blank</b> 136 labels for slot numbering, label size H x W (in mm): 5 x 7
		8WA8348-2AY
		<b>S7-300 mounting rails</b>
		• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box
		6ES7390-1AF85-0AA0
		• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box
		6ES7390-1AJ85-0AA0

#### Technical specifications

Article number	<b>6ES7152-1AA00-0AB0</b> ET200iSP, IM152-1 INTERFACE MODULE
<b>General information</b>	
• Isochronous mode	No
<b>Input current</b>	
from supply voltage L+, max.	30 mA
<b>Time stamping</b>	
Description	for each digital input, digital input module, total ET 200iS
Accuracy	20 ms
Number of stampable digital inputs, max.	64; for accuracy class 20 ms
Time format	RFC 1119 Internet (ISP)
Time resolution	1 ms
Time interval for transmitting the message buffer if a message is present	1 000 ms
Time stamp on signal change	rising / falling edge as signal entering or exiting
<b>Interfaces</b>	
Transmission rate, max.	1.5 Mbit/s
<b>Protocols</b>	
PROFIBUS DP	Yes
<b>PROFIBUS DP Services</b>	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes; Slave to slave as publisher

Article number	<b>6ES7152-1AA00-0AB0</b> ET200iSP, IM152-1 INTERFACE MODULE
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes
<b>Alarms</b>	
• acyclic function, interrupts	Yes
• acyclic function, parameters	Yes
<b>Diagnostics indication LED</b>	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
<b>Potential separation</b>	
between supply voltage and electronics	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G Ex ib IIC T4 and I M2 Ex ib I
• Type of protection acc. to KEMA	04 ATEX 1243
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	245 g

Article number	<b>6ES7193-7AA00-0AA0</b> ET200iSP, TERM.-MOD. TM-IM/EM60S, SCREW	<b>6ES7193-7AA10-0AA0</b> ET200iSP, TERM.-MOD. TM-IM/EM60C ,SPRING	<b>6ES7193-7AB00-0AA0</b> ET200iSP, TERM.-MOD. TM-IM/IM F. TWO IM
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
<b>Use in hazardous areas</b>			
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242
<b>Dimensions</b>			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	235 g	235 g	195 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP

### Digital electronic modules

#### Overview



#### Digital input modules

- 8-channel digital input module DI NAMUR EEx i, for evaluation of NAMUR sensors, connected and non-connected contacts, as well as for use as counter or frequency meter  
Parameterizable connections:
  - NAMUR sensor on/off
  - NAMUR changeover contact
  - Single contact connected (mechanical NO contact)
  - Changeover contact connected (mechanical changeover contact)
  - Single contact non-connected (mechanical NO contact with single contact)
  - Changeover contact non-connected (mechanical changeover contact)
  - Counting function: optional use of 2 channels for recording counter pulses or for frequency measurement
  - Short-circuit and wire break monitoring

#### Digital output modules

- 4-channel digital output modules DO EEx i, 23.1 V DC/20 mA, 17.4 V DC/27 mA, 17.4 V DC/40 mA or 25.5 V DC/22 mA, with external actuator switch-off via High or Low signal (H/L switch-off)
  - Load-free switching of outputs via external intrinsically-safe signal
  - Power boosting through parallel connection of two outputs for one actuator with 4 DO 17.4 V DC/27 mA or 4 DO 17.4 V DC/40 mA
  - Short-circuit and wire break monitoring
- 2-channel digital output module DO Relay EEx e, e.g. for switching solenoid valves, DC contactors or signaling lamps
  - Can be plugged onto TM-RM/RM terminal module
  - Output current up to 2 A with 60 V UC for each of the two relay outputs
  - Installation up to Ex zone 1
  - Intrinsically-safe and non-intrinsically-safe signals can be mixed in a station

#### Extra functions

##### Actuator shutdown function of the 4 DO EEx i modules

The 4 DO EEx i modules are equipped with a shutdown function. This permits implementation of an external switch-off independent of the automation system (controller).

As soon as the intrinsically-safe switch-off signal (High or Low) is present at the actuator switch-off input of the electronics module, its outputs are deactivated.

You can also combine several DO modules into a switch-off group. The intrinsically-safe power supply for the switch-off device is either via the watchdog module or a separate intrinsically-safe source.

#### Ordering data

#### Article No.

##### Digital input modules

##### Digital input modules EEx i

##### 8 DI NAMUR

For evaluation of NAMUR sensors, connected/non-connected contacts, as well as for recording counter pulses or measuring frequencies

- 8 × NAMUR (NAMUR sensor on/off, NAMUR changeover contact) or connected/non-connected inputs (single/changeover contact)
- 2 channels optionally usable as counters (max. 5 kHz) or frequency meters (1 Hz ... 5 kHz)
- Time tagging 20 ms, rising or falling edge
- Wire break monitoring
- Short-circuit monitoring
- Sensor power supply monitoring
- Flutter monitoring

**6ES7131-7RF00-0AB0**

#### Article No.

##### Digital output modules

##### Digital output modules EEx i with H-switch-off

(external actuator switch-off via H-signal); for switching of solenoid valves, DC relays, signal lamps, actuators

##### 4 DO DC 23.1 V/20 mA

- 4 channels with 20 mA each
- Short-circuit monitoring
- Wire break monitoring
- Configurable connection of substitute value in the event of CPU failure
- Load-free switching of outputs via external intrinsically-safe signal

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##### 4 DO DC 17.4 V/27 mA

- 4 channels with 27 mA each or 2 outputs connected in parallel with 54 mA each
- Short-circuit monitoring
- Wire break monitoring
- Configurable connection of substitute value in the event of CPU failure
- Load-free switching of outputs via external intrinsically-safe signal

**6ES7132-7RD11-0AB0**



Ordering data	Article No.	Terminal modules	Article No.
<b>4 DO DC 17.4 V/40 mA</b> <ul style="list-style-type: none"> <li>4 channels with 40 mA each or</li> <li>2 outputs connected in parallel with 80 mA each</li> <li>Short-circuit monitoring</li> <li>Wire break monitoring</li> <li>Configurable connection of substitute value in the event of CPU failure</li> <li>Load-free switching of outputs via external intrinsically-safe signal</li> </ul>	<b>6ES7132-7RD22-0AB0</b>	<b>ET 200iSP terminal module TM-EM/EM60</b> For two modules (reserve module, watchdog module and all electronics modules except 2 DO Relay can be plugged in) <ul style="list-style-type: none"> <li>For hazardous environments               <ul style="list-style-type: none"> <li>TM-EM/EM60S (blue screw-type terminals)</li> </ul> </li> <li>For non-hazardous environments               <ul style="list-style-type: none"> <li>TM-EM/EM60C (blue spring-loaded terminals)</li> <li>TM-EM/EM60S (black screw-type terminals)</li> </ul> </li> </ul>	<b>6ES7193-7CA00-0AA0</b> <b>6ES7193-7CA10-0AA0</b> <b>6ES7193-7CA20-0AA0</b>
Digital output modules EEx i with L-switch-off (external actuator switch-off via L-signal); for switching of solenoid valves, DC relays, signal lamps, actuators		<b>ET 200iSP terminal module TM-RM/RM 60</b> For two modules (electronics module 2 DO Relay and reserve module can be plugged-in) <ul style="list-style-type: none"> <li>TM-RM/RM60S (screw-type terminals)</li> </ul>	<b>6ES7193-7CB00-0AA0</b>
<b>4 DO DC 23.1 V/20 mA</b> <ul style="list-style-type: none"> <li>4 channels with 20 mA each</li> <li>Short-circuit monitoring</li> <li>Wire break monitoring</li> <li>Configurable connection of substitute value in the event of CPU failure</li> <li>Load-free switching of outputs via external intrinsically-safe signal</li> </ul>	<b>6ES7132-7GD00-0AB0</b>	<b>Accessories</b> <b>Reserve module</b> For any electronics module	<b>6ES7138-7AA00-0AA0</b>
<b>4 DO DC 17.4 V/27 mA</b> <ul style="list-style-type: none"> <li>4 channels with 27 mA each or</li> <li>2 outputs connected in parallel with 54 mA each</li> <li>Short-circuit monitoring</li> <li>Wire break monitoring</li> <li>Configurable connection of substitute value in the event of CPU failure</li> <li>Load-free switching of outputs via external intrinsically-safe signal</li> </ul>	<b>6ES7132-7GD10-0AB0</b>	<b>Labeling sheet</b> DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronics modules and 20 strips each for IM 151 <ul style="list-style-type: none"> <li>Petrol</li> <li>Yellow</li> </ul>	<b>6ES7193-7BH00-0AA0</b> <b>6ES7193-7BB00-0AA0</b>
<b>4 DO DC 17.4 V/40 mA</b> <ul style="list-style-type: none"> <li>4 channels with 40 mA each or</li> <li>2 outputs connected in parallel with 80 mA each</li> <li>Short-circuit monitoring</li> <li>Wire break monitoring</li> <li>Configurable connection of substitute value in the event of CPU failure</li> <li>Load-free switching of outputs via external intrinsically-safe signal</li> </ul>	<b>6ES7132-7GD21-0AB0</b>	<b>Labels, inscribed</b> For slot numbering, label size H x W (in mm): 5 x 7 <ul style="list-style-type: none"> <li>204 labels, for slots 1 to 20</li> <li>204 labels, for slots 1 to 40</li> </ul>	<b>8WA8361-0AB</b> <b>8WA8361-0AC</b>
<b>4 DO DC 25.5 V/22 mA<sup>1)</sup></b> <ul style="list-style-type: none"> <li>4 channels with 22 mA each</li> <li>Short-circuit monitoring</li> <li>Wire break monitoring</li> <li>Configurable connection of substitute value in the event of CPU failure</li> <li>Load-free switching of outputs via external intrinsically-safe signal</li> </ul>	<b>6ES7132-7GD30-0AB0</b>	<b>Labels, blank</b> 136 labels for slot numbering, label size H x W (in mm): 5 x 7	<b>8WA8348-2AY</b>
Digital output modules EEx e For switching of solenoid valves, DC contactors or indicator lights		<b>S7-300 DIN rails</b> <ul style="list-style-type: none"> <li>585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box</li> <li>885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box</li> </ul>	<b>6ES7390-1AF85-0AA0</b> <b>6ES7390-1AJ85-0AA0</b>
<b>2 DO Relay, 60 V UC, 2 A</b> <ul style="list-style-type: none"> <li>Can be plugged onto TM-RM/RM terminal module</li> <li>Output current up to 2 A with 60 V UC for each of the two relay outputs</li> <li>Installation up to Ex zone 1</li> <li>Configurable connection of substitute value in the event of CPU failure</li> </ul>	<b>6ES7132-7HB00-0AB0</b>		

<sup>1)</sup> Can be used with SIMATIC PCS 7 V7.1+SP2 or higher

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP**Digital electronic modules****Technical specifications**

Article number	<b>6ES7131-7RF00-0AB0</b> ET200iSP, EL. MOD., 8DI, NAMUR
<b>Input current</b>	
Current consumption, typ.	80 mA
from supply voltage L+, max.	90 mA
<b>Digital inputs</b>	
Number of digital inputs	8
Number of NAMUR inputs	8
<b>Encoder</b>	
Number of connectable encoders, max.	8
<b>Connectable encoders</b>	
• NAMUR encoder	Yes
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
<b>Diagnostic messages</b>	
• Diagnostic information readable	Yes
• Short-circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR CO contact/sensor to DIN 19234
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes

Article number	<b>6ES7131-7RF00-0AB0</b> ET200iSP, EL. MOD., 8DI, NAMUR
<b>Integrated Functions</b>	
Frequency measurement	Yes; (Gate time) 50 ms; 200 ms; 1 s
• Number of frequency meters	2
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
• between the channels	No
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1248
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	255 g

#### Technical specifications

Article number	<b>6ES7132-7RD01-0AB0</b> ET200iSP, EL. MOD., 4DO, 23.1 V DC, 20MA	<b>6ES7132-7RD11-0AB0</b> ET200iSP, EL. MOD., 4DO, 17.4 V DC, 27MA	<b>6ES7132-7RD22-0AB0</b> ET200iSP, EL. MOD., 4DO, 17.4 V DC, 40MA
<b>Input current</b>			
Current consumption, typ.	290 mA	260 mA	380 mA
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA	400 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	
<b>Digital outputs</b>			
Number of digital outputs	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown
Short-circuit protection	Yes	Yes	Yes
No-load voltage U <sub>ao</sub> (DC)	23.1 V	17.4 V	17.4 V
Internal resistor R <sub>i</sub>	275 Ω	150 Ω	167 Ω
<b>Trend key points E</b>			
• Voltage U <sub>e</sub> (DC)	17.6 V	13.3 V	10.7 V
• Current I <sub>e</sub>	20 mA	27 mA	40 mA; 80 mA when outputs connected in parallel
<b>Output current</b>			
• for signal "1" rated value	0.02 A	0.027 A	0.04 A
<b>Output delay with resistive load</b>			
• "0" to "1", max.	2 ms	2 ms	2 ms
• "1" to "0", max.	1.5 ms	1.5 ms	1.5 ms
<b>Parallel switching of two outputs</b>			
• for uprating	No; for Ex reasons not possible; nor for predecessor	Yes	Yes
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz
<b>Cable length</b>			
• shielded, max.	500 m	500 m	500 m
• unshielded, max.	500 m	500 m	500 m
<b>Interrupts/diagnostics/status information</b>			
Status indicator	Yes	Yes	Yes
Alarms		No	
Diagnostics function	Yes	Yes	
<b>Alarms</b>			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostic messages</b>			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break	Yes; R > 10 kohms, I < 100 μA	Yes	Yes; R > 10 kohms, I < 100 μA
• Short-circuit	Yes; R < 800 ohms (one output), R < 40 ohms (outputs connected in parallel)	Yes	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel
<b>Ex(i) characteristics</b>			
<b>Maximum values of output circuits (per channel)</b>			
• U <sub>o</sub> (output no-load voltage), max.			19.4 V
• I <sub>o</sub> (short-circuit current), max.			118 mA
• P <sub>o</sub> (power of load), max.			572 mW
• C <sub>o</sub> (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB
• L <sub>o</sub> (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP

### Digital electronic modules

#### Technical specifications

Article number	<b>6ES7132-7RD01-0AB0</b> ET200iSP, EL. MOD., 4DO, 23.1 V DC, 20MA	<b>6ES7132-7RD11-0AB0</b> ET200iSP, EL. MOD., 4DO, 17.4 V DC, 27MA	<b>6ES7132-7RD22-0AB0</b> ET200iSP, EL. MOD., 4DO, 17.4 V DC, 40MA
<b>Potential separation</b>			
<b>Potential separation digital outputs</b>			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
• Between the channels and load voltage L+	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
CE mark			Yes
<b>Highest safety class achievable in safety mode</b>			
• SIL acc. to IEC 61508	No		No
<b>Use in hazardous areas</b>			
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249
<b>Dimensions</b>			
Width	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm
<b>Weights</b>			
Weight, approx.	255 g	255 g	255 g

Article number	<b>6ES7132-7GD00-0AB0</b> ET200iSP, EL. MOD., 4DO, 23.1 V DC, 20MA	<b>6ES7132-7GD10-0AB0</b> ET200iSP, EL. MOD., 4DO, 17.4 V DC, 27MA	<b>6ES7132-7GD21-0AB0</b> ET200iSP, EL. MOD., 4DO, 17.4 V DC, 40MA	<b>6ES7132-7GD30-0AB0</b> ET200iSP, EL. MOD., 4DO, 25.5 V DC, 22MA
<b>Input current</b>				
Current consumption, typ.	290 mA	260 mA	380 mA	380 mA
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA; with actuator supply	400 mA	400 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA		
<b>Digital outputs</b>				
Number of digital outputs	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown
Short-circuit protection	Yes	Yes	Yes	Yes
No-load voltage U <sub>ao</sub> (DC)	23.1 V	17.4 V	17.4 V	25.5 V
Internal resistor R <sub>i</sub>	275 Ω	150 Ω	167 Ω	260 Ω
<b>Trend key points E</b>				
• Voltage U <sub>e</sub> (DC)	17.6 V	13.3 V	10.7 V	19.8 V
• Current I <sub>e</sub>	20 mA	27 mA; 54 mA when outputs connected in parallel	40 mA	22 mA
<b>Output current</b>				
• for signal "1" rated value	0.02 A	0.027 A	0.04 A	0.022 A
<b>Output delay with resistive load</b>				
• "0" to "1", max.	2 ms	2 ms	2 ms	2 ms
• "1" to "0", max.	1.5 ms	1.5 ms	1.5 ms	1.5 ms
<b>Parallel switching of two outputs</b>				
• for uprating	No; for Ex reasons not possible; nor for predecessor	Yes	Yes	No
<b>Switching frequency</b>				
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz	2 Hz
<b>Cable length</b>				
• shielded, max.	500 m	500 m	500 m	500 m
• unshielded, max.	500 m	500 m	500 m	500 m

### Technical specifications

Article number	<b>6ES7132-7GD00-0AB0</b> ET200iSP, EL. MOD., 4DO, 23.1 V DC, 20MA	<b>6ES7132-7GD10-0AB0</b> ET200iSP, EL. MOD., 4DO, 17.4 V DC, 27MA	<b>6ES7132-7GD21-0AB0</b> ET200iSP, EL. MOD., 4DO, 17.4 V DC, 40MA	<b>6ES7132-7GD30-0AB0</b> ET200iSP, EL. MOD., 4DO, 25.5 V DC, 22MA
<b>Interrupts/diagnostics/ status information</b>				
Status indicator	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostic messages</b>				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire-break	Yes; R > 10 kohms, I < 100 µA	Yes; R > 10 kohms, I < 100 µA	Yes; R > 10 kohms, I < 100 µA	Yes; R > 10 kohms, I < 100 µA
• Short-circuit	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)	Yes; R < 800 ohms (one output), R < 40 ohms (outputs connected in parallel)	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)	Yes; R < 80 ohms
<b>Diagnostics indication LED</b>				
• Group error SF (red)	Yes	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel	Yes; Per channel
<b>Ex(i) characteristics</b>				
<b>Maximum values of output circuits (per channel)</b>				
• U <sub>o</sub> (output no-load voltage), max.			19.4 V	27.9 V
• I <sub>o</sub> (short-circuit current), max.			118 mA	110 mA
• P <sub>o</sub> (power of load), max.			572 mW	764 mW
• C <sub>o</sub> (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB	81 nF; For IIC, 651 nF for IIB
• L <sub>o</sub> (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB	1.7 mH; For IIC, 11.5 mH for IIB
<b>Potential separation</b>				
<b>Potential separation digital outputs</b>				
• between the channels	No	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
• Between the channels and load voltage L+	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
<b>Highest safety class achievable in safety mode</b>				
• SIL acc. to IEC 61508	No	No	No	No
<b>Use in hazardous areas</b>				
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II 2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I	II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I
• Type of protection acc. to KEMA	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249
<b>Dimensions</b>				
Width	30 mm	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm	136.5 mm
<b>Weights</b>				
Weight, approx.	255 g	255 g	255 g	255 g

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP**Digital electronic modules****Technical specifications**

Article number	<b>6ES7132-7HB00-0AB0</b> ET200iSP, RELAY MOD., 2DO, 60 V UC, 2A
<b>Input current</b>	
Current consumption, typ.	100 mA
from load voltage L+ (without load), max.	120 mA
<b>Digital outputs</b>	
Number of digital outputs	2
Short-circuit protection	No
<b>Output current</b>	
• for signal "1" rated value	2 A
<b>Output delay with resistive load</b>	
• "0" to "1", max.	8 ms
• "1" to "0", max.	3 ms
<b>Parallel switching of two outputs</b>	
• for uprating	No
• for redundant control of a load	No
<b>Switching frequency</b>	
• with resistive load, max.	0.5 Hz; See data in manual
• with inductive load, max.	0.2 Hz; See data in manual
<b>Relay outputs</b>	
<b>Switching capacity of contacts</b>	
- with resistive load, up to 60 °C, max.	2 A; See data in manual
- Thermal continuous current, max.	2 A; See data in manual
<b>Cable length</b>	
• shielded, max.	500 m
• unshielded, max.	500 m
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Alarms	No
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnostic messages</b>	
• Diagnostic information readable	Yes
• Wire-break	No; Cannot be determined in contact power circuit
• Short-circuit	No; Cannot be determined in contact power circuit

Article number	<b>6ES7132-7HB00-0AB0</b> ET200iSP, RELAY MOD., 2DO, 60 V UC, 2A
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes; Per channel
<b>Ex(i) characteristics</b>	
<b>Maximum values of output circuits (per channel)</b>	
• U <sub>o</sub> (output no-load voltage), max.	60 V
• U <sub>m</sub> (fault voltage), max.	250 V
<b>Potential separation</b>	
<b>Potential separation digital outputs</b>	
• between the channels	Yes
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes; Channels and power bus
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Highest safety class achievable in safety mode</b>	
• SIL acc. to IEC 61508	No
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G and I M2 Ex eibmb IIC T4; Ex eibmb I
• Type of protection acc. to KEMA	07 ATEX 0180
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	255 g

Article number	<b>6ES7193-7CA00-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/EM60S F. EM	<b>6ES7193-7CA10-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/EM60C F. EM	<b>6ES7193-7CA20-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/EM60S F. EM
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
<b>Use in hazardous areas</b>			
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system	see ET 200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	
<b>Dimensions</b>			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	275 g	275 g	235 g

## Overview



## Analog input modules

- 4-channel analog input module AI 2 WIRE HART EEx i for current measurement in the range 4 to 20 mA, suitable for connection of 2-wire transmitters (with/without HART functionality)
  - Resolution 12 bit + sign
  - Max. load of transmitter 750  $\Omega$
  - Short-circuit and wire break monitoring
- 4-channel analog input module AI 4 WIRE HART EEx i for current measurement in the range 0/4 to 20 mA, suitable for connection of 4-wire transmitters (with/without HART functionality)
  - Resolution 12 bit + sign
  - Max. load of transmitter 750  $\Omega$
  - Wire break monitoring

- 4-channel analog input module AI RTD EEx i for resistance measurement and for temperature measurement by Pt100/Ni100 resistance thermometer
  - Resolution 15 bit + sign
  - 2, 3, or 4-wire connection possible
  - Resistance measurements 600  $\Omega$  absolute and 1 000  $\Omega$  absolute
  - Wire break monitoring
- 4-channel analog input module AI TC EEx i for thermoelectric EMF measurements and for temperature measurement by thermocouple, type B, E, N, J, K, L, S, R, T, U
  - Resolution 15 bit + sign
  - Internal temperature compensation possible using TC sensor module (included in scope of delivery of module)
  - External temperature compensation by means of a temperature value acquired at an analog module of the same ET 200iSP station
  - Wire break monitoring

## Analog output modules

- 4-channel analog output module AO I HART EEx i for output of current signals in the range 0/4 to 20 mA to field devices (with/without HART functionality)
  - Resolution 14 bit
  - Parameterizable substitute value in case of CPU failure
  - Short-circuit and wire break monitoring

## Extra functions

## Temperature compensation

A TC sensor module for internal temperature compensation is provided with the 4 AI TC module, and is fitted on the corresponding terminals of the associated terminal module.

External temperature compensation is possible via a Pt100 on a 4 AI RTD module.

## Ordering data

## Article No.

## Article No.

## Analog input modules

## Analog input modules EEx i

## 4 AI 2 WIRE HART

For measuring currents with 2-wire transmitters with/without HART functionality

- 4 x 4 ... 20 mA, HART, 2-wire transmitter
- Transmitter load: max. 750  $\Omega$
- Resolution 12 bit + sign
- Short-circuit monitoring
- Wire break monitoring

6ES7134-7TD00-0AB0

## 4 AI 4 WIRE HART

For measuring currents with 4-wire transmitters with/without HART functionality

- 4 x 0/4 ... 20 mA, HART, 4-wire transmitter
- Transmitter load: max. 750  $\Omega$
- Resolution 12 bit + sign
- Wire break monitoring

6ES7134-7TD50-0AB0

## 4 AI RTD

For measuring resistances as well as for temperature measurements with resistance thermometers

- 4 x RTD, resistance thermometer Pt100/Ni100
- 2, 3, 4-wire
- Resolution 15 bit + sign
- Short-circuit monitoring
- Wire break monitoring

6ES7134-7SD51-0AB0

## 4 AI TC

For thermoelectric EMF measurements as well as for temperature measurements with thermocouples

- 4 x TC (thermocouples)
- Type B [PtRh-PtRh]
- Type N [NiCrSi-NiSi]
- Type E [NiCr-CuNi]
- Type R [PtRh-Pt]
- Type S [PtPh-Pt]
- Type J [Fe-CuNi]
- Type L [Fe-CuNi]
- Type T [Cu-CuNi]
- Type K [NiCr-Ni]
- Type U [Cu-CuNi]
- Resolution 15 bit + sign
- Internal compensation of reference junction temperature possible using TC sensor module (included in scope of supply of module)
- External temperature compensation via Pt100, connected to RTD module of same ET 200iSP station
- Wire break monitoring

6ES7134-7SD00-0AB0

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP

### Analog electronic modules

Ordering data	Article No.	Accessories	Article No.
<b>Analog output modules</b>		<b>Reserve module</b>	<b>6ES7138-7AA00-0AA0</b>
Analog output modules EEx i		For any electronic module	
<b>4 AO I HART</b>	<b>6ES7135-7TD00-0AB0</b>	<b>Labeling sheet</b>	
For output of currents to field devices with/without HART functionality		DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• 4 × 0/4 ... 20 mA, HART (max. load 750 Ω)		• Petrol	<b>6ES7193-7BH00-0AA0</b>
• Resolution 14-bit		• Yellow	<b>6ES7193-7BB00-0AA0</b>
• Short-circuit monitoring		<b>Labels, inscribed</b>	
• Wire break monitoring		For slot numbering, label size H × W (in mm): 5 × 7	
• Parameterizable substitute value in case of CPU failure		• 204 labels, for slots 1 to 20	<b>8WA8361-0AB</b>
		• 204 labels, for slots 1 to 40	<b>8WA8361-0AC</b>
<b>Terminal modules</b>		<b>Labels, blank</b>	
<b>ET 200iSP terminal module TM-EM/EM60</b>		136 labels for slot numbering, label size H × W (in mm): 5 × 7	<b>8WA8348-2AY</b>
For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in)		<b>S7-300 mounting rails</b>	
• For hazardous environments	<b>6ES7193-7CA00-0AA0</b>	• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	<b>6ES7390-1AF85-0AA0</b>
- TM-EM/EM60S (blue screw-type terminals)		• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	<b>6ES7390-1AJ85-0AA0</b>
- TM-EM/EM60C (blue spring-loaded terminals)	<b>6ES7193-7CA10-0AA0</b>		
• For non-hazardous environments			
- TM-EM/EM60S (black screw-type terminals)	<b>6ES7193-7CA20-0AA0</b>		

### Technical specifications

Article number	<b>6ES7134-7SD00-0AB0</b>	<b>6ES7134-7SD51-0AB0</b>	<b>6ES7134-7TD00-0AB0</b>	<b>6ES7134-7TD50-0AB0</b>
	ET200iSP, EL-MOD., 4 AI TC	ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
<b>Input current</b>				
Current consumption, typ.	17 mA	19 mA	280 mA	27 mA
from supply voltage L+, max.	30 mA	22 mA	320 mA	30 mA
<b>Output voltage</b>				
<b>Power supply to the transmitters</b>			Yes	
• short-circuit proof			23 mA; per channel	
• Supply current, max.				
<b>Analog inputs</b>				
Number of analog inputs	4	4	4	4
permissible input current for current input (destruction limit), max.			90 mA	50 mA
Cycle time (all channels) max.	320 ms; 66 ms basic conversion time x 4 channels with interference frequency suppression 60 Hz, 80 ms basic conversion time x 4 channels with interference frequency suppression 50 Hz	320 ms; 66 ms basic conversion time x 4 channels with interference frequency suppression 60 Hz, 80 ms basic conversion time x 4 channels with interference frequency suppression 50 Hz	120 ms; 30 ms basic conversion time x4 channels with 60 Hz, 50 Hz interference frequency suppression	120 ms; 30 ms basic conversion time x4 channels with 60 Hz, 50 Hz interference frequency suppression
Technical unit for temperature measurement adjustable	Yes	Yes	Yes	Yes
<b>Input ranges (rated values), voltages</b>				
• -80 mV to +80 mV	Yes			
<b>Input ranges (rated values), currents</b>				
• 4 mA to 20 mA			Yes	Yes



#### Technical specifications

Article number	6ES7134-7SD00-0AB0 ET200iSP, EL-MOD., 4 AI TC	6ES7134-7SD51-0AB0 ET200iSP, EL-MOD., 4 AI RTD, PT100/Ni100	6ES7134-7TD00-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	6ES7134-7TD50-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
<b>Input ranges (rated values), thermocouples</b>				
• Type B	Yes			
• Type C	Yes			
• Type E	Yes			
• Type J	Yes			
• Type K	Yes			
• Type L	Yes			
• Type N	Yes			
• Type R	Yes			
• Type S	Yes			
• Type T	Yes			
• Type U	Yes			
<b>Input ranges (rated values), resistance thermometer</b>				
• Ni 100		Yes		
• Pt 100		Yes		
<b>Input ranges (rated values), resistors</b>				
• 0 to 600 ohms		Yes; also 1 000 ohms		
<b>Thermocouple (TC)</b>				
<b>Temperature compensation</b>				
- internal temperature compensation	Yes; via supplied TC sensor module			
- external temperature compensation with compensations socket	Yes; via temperature value, acquired by an analog module of the same ET 200iSP station			
<b>Characteristic linearization</b>				
• parameterizable	Yes	Yes		
- for thermocouples	Yes			
- for resistance thermometer		Yes		
<b>Cable length</b>				
• shielded, max.	50 m	500 m	500 m	500 m
<b>Analog value generation for the inputs</b>				
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)
<b>Integration and conversion time/resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	13 bit	12 bit; + sign
• Integration time, parameterizable	Yes	Yes	No	Yes
• Basic conversion time, including integration time (ms)	80 ms at 50 Hz; 66 ms at 60 Hz	80 ms at 50 Hz; 66 ms at 60 Hz		
<b>Smoothing of measured values</b>				
• parameterizable	Yes; in 4 stages	Yes; in 4 stages	Yes; in 4 stages	Yes; in 4 stages
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
• for current measurement as 2-wire transducer			Yes	
- Burden of 2-wire transmitter, max.			750 Ω	
• for current measurement as 4-wire transducer				Yes
• for resistance measurement with two-wire connection		Yes		
• for resistance measurement with three-wire connection		Yes		
• for resistance measurement with four-wire connection		Yes		

**I/O systems**

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

**Analog electronic modules****Technical specifications**

Article number	<b>6ES7134-7SD00-0AB0</b> ET200iSP, EL-MOD., 4 AI TC	<b>6ES7134-7SD51-0AB0</b> ET200iSP, EL-MOD., 4 AI RTD, PT100/Ni100	<b>6ES7134-7TD00-0AB0</b> ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	<b>6ES7134-7TD50-0AB0</b> ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
<b>Errors/accuracies</b>				
Linearity error (relative to input range), (+/-)	0.015 %	0.015 %	0.015 %	0.015 %
Temperature error (relative to input range), (+/-)	0.02 %/K	0.02 %/K	0.005 %/K	0.005 %/K
Crosstalk between the inputs, min.	-50 dB	-50 dB	-50 dB	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.01 %	0.01 %	0.01 %	0.01 %
<b>Operational error limit in overall temperature range</b>				
<ul style="list-style-type: none"> <li>Voltage, relative to input range, (+/-)</li> <li>Current, relative to input range, (+/-)</li> <li>Resistance thermometer, relative to input range, (+/-)</li> </ul>	0.15 %	0.15 %; Applies to r resistances standard $\pm 0.8$ K, climatic $\pm 0.3$ K	0.15 %	0.15 %
<b>Basic error limit (operational limit at 25 °C)</b>				
<ul style="list-style-type: none"> <li>Voltage, relative to input range, (+/-)</li> <li>Current, relative to input range, (+/-)</li> <li>Resistance thermometer, relative to input range, (+/-)</li> </ul>	0.1 %	0.1 %; Applies to resistances standard $\pm 0.5$ K, climatic $\pm 0.2$ K	0.1 %	0.1 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>				
<ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>Common mode interference, min.</li> </ul>	70 dB 90 dB	70 dB 90 dB	70 dB	70 dB
<b>Interrupts/diagnostics/status information</b>				
<b>Alarms</b>				
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> <li>Limit value alarm</li> </ul>	Yes; Parameterizable Yes; Parameterizable	Yes Yes	Yes; Parameterizable Yes; Parameterizable	Yes; Parameterizable Yes; Parameterizable
<b>Diagnoses</b>				
<ul style="list-style-type: none"> <li>Diagnostic information readable</li> <li>Wire-break</li> <li>Short-circuit</li> <li>Group error</li> </ul>	Yes	Yes Yes Yes Yes	Yes Yes Yes	Yes Yes
<b>Diagnostics indication LED</b>				
<ul style="list-style-type: none"> <li>Group error SF (red)</li> </ul>	Yes	Yes	Yes	Yes
<b>Potential separation</b>				
<b>Potential separation analog inputs</b>				
<ul style="list-style-type: none"> <li>between the channels</li> <li>between the channels and backplane bus</li> <li>Between the channels and load voltage L+</li> </ul>	Yes; Functional Yes	No Yes Yes; Channels and power bus	No Yes	No Yes
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
<b>Highest safety class achievable in safety mode</b>				
<ul style="list-style-type: none"> <li>Performance level according to ISO 13849-1</li> <li>SIL acc. to IEC 61508</li> </ul>	none No	none No	none No	none No

#### Technical specifications

Article number	6ES7134-7SD00-0AB0	6ES7134-7SD51-0AB0	6ES7134-7TD00-0AB0	6ES7134-7TD50-0AB0
	ET200iSP, EL-MOD., 4 AI TC	ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
<b>Use in hazardous areas</b>				
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1246	04 ATEX 1247	04 ATEX 1244	04 ATEX 1245
<b>Dimensions</b>				
Width	30 mm	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm	136.5 mm
<b>Weights</b>				
Weight, approx.	230 g	230 g	230 g	230 g
Article number	<b>6ES7135-7TD00-0AB0</b>		Article number	<b>6ES7135-7TD00-0AB0</b>
	ET200iSP, EL-MOD., 4 AO, 4-20MA, HART			ET200iSP, EL-MOD., 4 AO, 4-20MA, HART
<b>Input current</b>			<b>Operational error limit in overall temperature range</b>	
Current consumption, typ.	295 mA		• Current, relative to output range, (+/-)	0.15 %
from load voltage L+ (without load), max.	330 mA		<b>Basic error limit (operational limit at 25 °C)</b>	
<b>Analog outputs</b>			• Current, relative to output range, (+/-)	0.1 %
Number of analog outputs	4		<b>Interrupts/diagnostics/status information</b>	
Cycle time (all channels) max.	3.6 ms		Substitute values connectable	Yes
<b>Output ranges, current</b>			<b>Alarms</b>	
• 0 to 20 mA	Yes		• Diagnostic alarm	Yes
• 4 mA to 20 mA	Yes		<b>Diagnoses</b>	
<b>Connection of actuators</b>			• Diagnostic information readable	Yes
• for current output two-wire connection	Yes		• Wire-break	Yes
<b>Load impedance (in rated range of output)</b>			• Short-circuit	Yes
• with current outputs, max.	750 Ω		<b>Diagnostics indication LED</b>	
<b>Cable length</b>			• Group error SF (red)	Yes
• shielded, max.	500 m		<b>Potential separation</b>	
<b>Analog value generation for the outputs</b>			<b>Potential separation analog outputs</b>	
<b>Integration and conversion time/resolution per channel</b>			• between the channels	No
• Resolution with overrange (bit including sign), max.	14 bit		• between the channels and backplane bus	Yes
<b>Settling time</b>			<b>Standards, approvals, certificates</b>	
• for resistive load	4 ms		CE mark	Yes
• for capacitive load	40 ms		<b>Use in hazardous areas</b>	
• for inductive load	40 ms		• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
<b>Errors/accuracies</b>			• Type of protection acc. to KEMA	04 ATEX 1250
Linearity error (relative to output range), (+/-)	0.015 %		<b>Dimensions</b>	
Temperature error (relative to output range), (+/-)	0.005 %/K		Width	30 mm
Crosstalk between the outputs, min.	-50 dB		Height	129 mm
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.01 %		Depth	136.5 mm
			<b>Weights</b>	
			Weight, approx.	265 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP

### Safety-related electronic modules

#### Overview



The electronic modules of the SIMATIC ET 200iSP distributed I/O-system equipped with safety functions can be used together with the safety-related automation systems (controllers) for the implementation of safety applications. The input modules record the process signals, evaluate them, and prepare them for additional processing by the automation system. The output modules convert the safety-related signals output by the automation systems so that they are suitable for controlling the connected actuators.

#### F digital input modules

- 8 F-DI Ex NAMUR
  - Safety-related digital input module for evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/non-connected mechanical contacts in hazardous and non-hazardous areas
  - SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)
  - 8 short-circuit-proof sensor supplies (8 V DC) for 1 channel each
  - Inputs and sensor supplies electrically isolated from power bus and backplane bus
  - Diagnostics evaluation (deactivated for non-connected mechanical contacts)
  - Internal diagnostics buffer
  - Programmable diagnostics interrupt
  - Supports time stamping
  - Channel-selective passivation
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors and channel status/fault

#### F digital output modules

- 4 F-DO Ex DC 17.4 V/40 mA
  - Safety-related digital output module for controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lamps
  - SIL3/Cat.3/PLe with 4 outputs, switching to P/P potential
  - Electrical isolation from power bus and backplane bus
  - Rated load voltage 17.4 V DC
  - Max. output current 40 mA
  - Performance enhancement through parallel connection of two digital outputs for one actuator
  - Short-circuit, overload and wire-break monitoring
  - Configurable diagnostics
  - Internal diagnostics buffer
  - Programmable diagnostics interrupt
  - Channel-selective passivation
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors and channel status/fault

#### F analog input modules

- 4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA)
  - Safety-related digital input module for evaluating the signals from current sensors in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices
  - SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation)
  - Measuring ranges: 0 ... 20 mA or 4 ... 20 mA
  - Resolution 15 bit + sign
  - HART communication in measuring range 4 ... 20 mA
  - 4 short-circuit-proof sensor supplies (min. 12 V DC; max. 26 V DC) for 1 channel each
  - Inputs and sensor supplies electrically isolated from backplane bus
  - Configurable diagnostics
  - Programmable diagnostics interrupt
  - Internal diagnostics buffer
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors, channel faults and HART status per channel

Ordering data	Article No.	Ordering data	Article No.
<b>Safety-related electronics modules</b>		<b>Terminal modules</b>	
<u>F digital input modules</u>		<b>ET 200iSP terminal module TM-EM/EM60</b>	
<b>8 F-DI Ex NAMUR</b> For evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/non-connected mechanical contacts in hazardous and non-hazardous areas • SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)	<b>6ES7138-7FN00-0AB0</b>	For two modules (reserve module, watchdog module and all electronics modules except 2 DO Relay can be plugged in) • For hazardous environments - TM-EM/EM60S (blue screw-type terminals) - TM-EM/EM60C (blue spring-loaded terminals) • For non-hazardous environments - TM-EM/EM60S (black screw-type terminals)	<b>6ES7193-7CA00-0AA0</b> <b>6ES7193-7CA10-0AA0</b> <b>6ES7193-7CA20-0AA0</b>
<u>F digital output modules</u>		<b>Accessories</b>	
<b>4 F-DO Ex 17.4 V DC/40 mA</b> For controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lamps • SIL3/Cat.3/PLe with 4 outputs, switching to P/P potential	<b>6ES7138-7FD00-0AB0</b>	<b>Reserve module</b> For any electronics module	<b>6ES7138-7AA00-0AA0</b>
<u>F analog input modules</u>		<b>Labeling sheet</b> DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronics modules and 20 strips each for IM 151 • Petrol • Yellow	<b>6ES7193-7BH00-0AA0</b> <b>6ES7193-7BB00-0AA0</b>
<b>4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA)</b> For evaluating the signals from current sensors in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices • SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation) • Resolution 15 bit + sign • HART communication in measuring range 4 ... 20 mA	<b>6ES7138-7FA00-0AB0</b>	<b>Labels, inscribed</b> For slot numbering, label size H x W (in mm): 5 x 7 • 204 labels, for slots 1 to 20 • 204 labels, for slots 1 to 40	<b>8WA8361-0AB</b> <b>8WA8361-0AC</b>
		<b>Labels, blank</b> 136 labels for slot numbering, label size H x W (in mm): 5 x 7	<b>8WA8348-2AY</b>
		<b>S7-300 mounting rails</b> • 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box • 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	<b>6ES7390-1AF85-0AA0</b> <b>6ES7390-1AJ85-0AA0</b>

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP**Safety-related electronic modules****Technical specifications**

Article number	<b>6ES7138-7FN00-0AB0</b> ET200iSP, 8F-DI NAMUR EX, FAILSAFE
<b>Input current</b>	
Current consumption, typ. from supply voltage L+, max.	145 mA 150 mA; int. Powerbus
<b>Encoder supply</b>	
Number of outputs	8
Type of output voltage	8 V DC
<b>Digital inputs</b>	
Number of digital inputs	8
Number of NAMUR inputs	8
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	1.2 mA
• for signal "1", min.	2.1 mA
• for signal "1", typ.	9.5 mA
<b>Encoder</b>	
Number of connectable encoders, max.	8
<b>Connectable encoders</b>	
• NAMUR encoder	Yes
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• Wire-break	Yes; NAMUR encoders or single contact with 10 kOhm parallel resistor
• Short-circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR changeover contact/ sensor to DIN 19234
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
• between the channels	No
• between the channels and backplane bus	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0056
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	288 g

Article number	<b>6ES7138-7FD00-0AB0</b> ET200iSP, 4F-DO 40MA EX, FAILSAFE
<b>Input current</b>	
Current consumption, typ. from load voltage L+ (without load), max.	340 mA 510 mA; int. Powerbus
<b>Digital outputs</b>	
Number of digital outputs	4
Short-circuit protection	Yes
Controlling a digital input	No
No-load voltage U <sub>ao</sub> (DC)	17.4 V
Internal resistor R <sub>i</sub>	167 Ω
<b>Load resistance range</b>	
• lower limit	270 Ω
• upper limit	18 kΩ
<b>Trend key points E</b>	
• Voltage U <sub>e</sub> (DC)	10.7 V
• Current I <sub>e</sub>	40 mA
<b>Output voltage</b>	
• for signal "1", max.	17.4 V
<b>Output current</b>	
• for signal "0" residual current, max.	10 μA
<b>Parallel switching of two outputs</b>	
• for uprating	Yes
• for redundant control of a load	No
<b>Switching frequency</b>	
• with resistive load, max.	30 Hz
• with inductive load, max.	2 Hz
<b>Cable length</b>	
• shielded, max.	500 m
• unshielded, max.	500 m
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• Wire-break	Yes
• Short-circuit	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
<b>Potential separation</b>	
<b>Potential separation digital outputs</b>	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes

### Technical specifications

Article number	<b>6ES7138-7FD00-0AB0</b> ET200iSP, 4F-DO 40MA EX, FAILSAFE
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ja Ga][ja IIIC Da] IIC T4 GB and I M2 Ex ib[ja Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0057
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	285 g
Article number	<b>6ES7138-7FA00-0AB0</b> ET200iSP, 4F-AI HART EX, FAILSAFE
<b>Input current</b>	
Current consumption, typ. from supply voltage L+, max.	315 mA 490 mA; int. Powerbus
<b>Output voltage</b>	
<b>Power supply to the transmitters</b>	
• short-circuit proof	Yes
• Supply current, max.	25 mA; Plus 4 mA per channel
<b>Analog inputs</b>	
Number of analog inputs	4
Cycle time (all channels) max.	See data in manual
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Cable length</b>	
• shielded, max.	500 m
<b>Analog value generation for the inputs</b>	
Measurement principle	integrating (Sigma-Delta)
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
<b>Smoothing of measured values</b>	
• parameterizable	Yes; in 4 stages
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	750 Ω

Article number	<b>6ES7138-7FA00-0AB0</b> ET200iSP, 4F-AI HART EX, FAILSAFE
<b>Errors/accuracies</b>	
Linearity error (relative to input range), (+/-)	0.015 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.015 %
<b>Operational error limit in overall temperature range</b>	
• Current, relative to input range, (+/-)	0.35 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to input range, (+/-)	0.1 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode interference, min.	50 dB
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• Wire-break	Yes
• Short-circuit	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
<b>Potential separation</b>	
<b>Potential separation analog inputs</b>	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes; Power bus
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ja Ga][ja IIIC Da] IIC T4 GB and I M2 Ex ib[ja Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0058
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	299 g

## I/O systems

SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP

### Watchdog module

#### Overview



The watchdog module has two fundamental functions:

- Monitoring of the ET 200iSP remote I/O station for hardware failures (hardware lifebeat); external, applicative failure monitoring is also possible via an I/O address area of the module
- Intrinsically-safe power supply for external actuator switch-off

The watchdog module must be plugged onto a terminal module (order separately). The following terminal modules are suitable for this:

- TM-IM/EM60 terminal modules for one interface module and one watchdog, reserve or electronics module (for versions, see Interface module section)
- TM-EM/EM60 terminal modules with two slots for watchdog module, reserve module or electronics modules (except 2 DO relay):
  - with blue screw-type or spring-loaded terminals for hazardous environments
  - with black screw-type terminals for non-hazardous environments

The first slot directly next to the interface module is provided for the watchdog module.

#### Ordering data

#### Article No.

##### Watchdog module

**Watchdog module**  
For failure monitoring and for the intrinsically-safe power supply of an external actuator switch-off

**6ES7138-7BB00-0AB0**

##### Terminal modules

##### ET 200iSP terminal module TM-EM/EM60

For two modules (reserve module, watchdog module and all electronics modules except 2 DO Relay can be plugged in)

- For hazardous environments
  - TM-EM/EM60S (blue screw-type terminals)
  - TM-EM/EM60C (blue spring-loaded terminals)
- For non-hazardous environments
  - TM-EM/EM60S (black screw-type terminals)

**6ES7193-7CA00-0AA0**

**6ES7193-7CA10-0AA0**

**6ES7193-7CA20-0AA0**

##### Accessories

##### Labeling sheet

DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronics modules and 20 strips each for IM 151

- Petrol
- Yellow

**6ES7193-7BH00-0AA0**

**6ES7193-7BB00-0AA0**

##### Labels, inscribed

for slot numbering, label size H x W (in mm): 5 x 7

- 204 labels, for slots 1 to 20
- 204 labels, for slots 1 to 40

**8WA8361-0AB**

**8WA8361-0AC**

##### Labels, blank

136 labels for slot numbering, label size H x W (in mm): 5 x 7

**8WA8348-2AY**

#### Technical specifications

Article number	<b>6ES7138-7BB00-0AB0</b> ET 200iSP, WATCHDOG MOD.
<b>Digital inputs</b>	
Number of digital inputs	0
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm



## Overview

**Tasks of the RS 485-iS coupler**

- Conversion of the electrical PROFIBUS DP RS 485 transmission technology into the intrinsically-safe RS 485-iS transmission technology with a transmission rate of 1.5 Mbps
- Required to connect intrinsically-safe PROFIBUS DP stations, e.g. ET 200iSP or devices from other vendors with Ex i DP connection
- Acts as a safety barrier
- Additional use as a repeater in the hazardous area
- Passive bus station (no configuration necessary)
- Certified according to ATEX 100a

## Ordering data

**RS 485-iS coupler**  
Isolating transformer for connection of PROFIBUS DP segments with RS 485 and RS 485-iS transmission systems

**Article No.**  
**6ES7972-0AC80-0XA0**

**Accessories**

**PROFIBUS connector with selectable terminating resistor**  
For connection of IM 152 to PROFIBUS DP with RS 485-iS transmission technology

**Article No.**  
**6ES7972-0DA60-0XA0**

**S7-300 DIN rails**

Lengths:  
• 160 mm  
• 482 mm  
• 530 mm  
• 830 mm  
• 2 000 mm

**Article No.**  
**6ES7390-1AB60-0AA0**  
**6ES7390-1AE80-0AA0**  
**6ES7390-1AF30-0AA0**  
**6ES7390-1AJ30-0AA0**  
**6ES7390-1BC00-0AA0**

**Article No.**

**PROFIBUS FastConnect Standard Cable, violet**  
Standard type with special design for fast mounting, 2-wire, shielded, cut-to-length

**Article No.**  
**6XV1830-0EH10**

Specify length in m  
Max. delivery unit 1 000 m,  
minimum order quantity 20 m

Preferred lengths

- 20 m
- 50 m
- 100 m
- 200 m
- 500 m
- 1 000 m

**Article No.**  
**6XV1830-0EN20**  
**6XV1830-0EN50**  
**6XV1830-0ET10**  
**6XV1830-0ET20**  
**6XV1830-0ET50**  
**6XV1830-0EU10**

**PROFIBUS FastConnect Standard Cable IS GP, blue**  
Cable type for use in potentially explosive atmospheres, with special design for fast mounting, 2-wire, shielded, cut-to-length

**Article No.**  
**6XV1831-2A**

Specify length in m  
Max. delivery unit 1 000 m,  
minimum order quantity 20 m

## Technical specifications

**Technical specifications - RS 485-iS coupler****Dimensions and weight**

Dimensions W x H x D (mm)	80 x 125 x 130
Weight	Approx. 500 g

**Technical data - General**

Degree of protection	IP20
Ambient temperature	- 20 ... + 60 °C

**I/O systems**SIMATIC ET 200 systems for the control cabinet  
SIMATIC ET 200iSP**RS 485-iS coupler****Technical specifications****Technical specifications - RS 485-iS coupler****Standards and approvals**

• PROFIBUS	IEC 61784-1:2002 Ed1 CP 3/1
• EU directive	94/9/EG (ATEX 100a)
• CENELEC	II 3 (2) G EEx nA[ib] IIC T4
• UL and CSA	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Division 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
• FM	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Division 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
• IEC	IEC61131-2, Part 2
• CE	Conforming with 89/336/EWG Conforming with 73/23/EWG
• Ship-building certification	Classification companies • ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRD (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)

**Module-Specific Specifications**

Transmission rate on PROFIBUS DP, PROFIBUS RS 485-iS	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbps 1.5 Mbps
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Bus-Protocol	PROFIBUS DP
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**Voltages, Currents, Potentials**

Rated supply voltage of RS 485-iS coupler	24 V DC (20.4 ... 28.8 V)
• Polarity reversal protection	Yes
• Voltage drop bypass	Min. 5 ms

Electrical isolation of 24 V power supply	
• to PROFIBUS DP	Yes
- tested with	500 V DC
• to PROFIBUS RS 485-iS	Yes
- tested with	AC 500 V

Current consumption RS 485-iS coupler (24 V DC), max.	150 mA
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Power loss of the module, typically	3 Watts
-------------------------------------	---------

**Status, alarms, diagnostics**

Status display	no
Alarms	None
Diagnostic functions	Yes
• Bus monitoring PROFIBUS DP (primary)	Yellow LED "DP1"
• Bus monitoring PROFIBUS RS 485-iS (secondary)	Yellow LED "DP2"
• Monitoring 24 V power supply	Green LED "ON"

**Technical safety notice**

$V_{DC}$	$\pm 4.2$ V
$I_{SC}$	$\pm 93$ mA
$P_0$	0.1 Watts
$V_{max}$	$\pm 4.2$ V
$L_I$	0
$C_i$	0
$U_m$	AC 250 V
$T_a$	-25 ... +60 °C

**RS 485-IS segment**

permitted cable length on a single line	RS 485-iS	DP Ex i
• 9.6 to 187.5 Kbps	1 000 m	200 m
• 500 kbit/s	400 m	200 m
• 1.5 Mbps	200 m	200 m
Number of PROFIBUS DP nodes that can be connected, max.	31	16
PROFIBUS RS 485-iS bus terminator switch	integrated, can be added	

Ordering data	Article No.
<b>Stainless steel enclosure IP65 for SIMATIC ET 200iSP</b>	<b>6DL2804-</b> ■ ■ ■ ■ ■
<b>I/O enclosure</b>	
Surface casing in stainless steel, max. IP66, with mounting plate and equipotential bonding rail, empty enclosure for installation of ET 200iSP components <sup>1)</sup>	<b>0</b>
I/O device consisting of surface casing with installed ET 200iSP components <sup>2)</sup>	<b>1</b>
I/O device consisting of surface casing with installed ET 200iSP and pneumatic components <sup>2)</sup>	<b>2</b>
<b>Device group</b>	
Device group II, up to zone 1 (including zone 2)	<b>A</b>
Device group II, up to zone 21 (including zone 22)	<b>D</b>
<b>Enclosure dimensions W x H x D (in mm)</b>	
650 x 450 x 230, for 15 ET 200iSP modules in non-redundant configuration	<b>D</b>
950 x 450 x 230, for 25 ET 200iSP modules in non-redundant configuration	<b>E</b>
800 x 800 x 300, for 2 rows with max. 30 ET 200iSP modules	<b>K</b>
800 x 1000 x 300, for 2 rows with max. 30 ET 200iSP modules	<b>M</b>
1000 x 1000 x 300, for 2 rows with max. 42 ET 200iSP modules	<b>U</b>
1000 x 1200 x 300, for 2 rows with max. 42 ET 200iSP modules	<b>V</b>
<b>Cable entries/number</b>	
M16 cable entries for signals, 3 rows, 39 or 66 units <sup>3)</sup> , 2 x M32 for supply voltage, 4 x M20 for bus cables	<b>3</b>
M20 cable entries for signals, 3 rows, 36 or 57 units <sup>3)</sup> , 2 x M32 for supply voltage, 4 x M20 for bus cables	<b>4</b>
M16 cable entries for signals, 5 rows, 65 or 110 units <sup>3)</sup> , 2 x M32 for supply voltage, 4 x M20 for bus cables	<b>5</b>
M20 cable entries for signals, 3 rows, 60 or 95 units <sup>3)</sup> , 2 x M32 for supply voltage, 4 x M20 for bus cables	<b>6</b>
Icotek cable entry strip IP65, for up to 45 or 90 signals <sup>3)</sup> , 2 x M32 for supply voltage, 4 x M20 for bus cables <sup>4)</sup>	<b>7</b>
<b>Cable entries/material</b>	
Cable entry in <b>plastic, black</b>	<b>0</b>
Ambient operating temperatures: • Surface casing -40...+70 °C • I/O device -40 ... +xx °C <sup>5)6)</sup>	
Cable entry in <b>metal (nickel-plated brass)</b>	<b>1</b>
Ambient operating temperatures: • Surface casing -40...+70 °C • I/O device -40 ... +xx °C <sup>5)6)</sup>	
Cable entry in <b>plastic, blue</b>	<b>2</b>
Ambient operating temperatures: • Surface casing -40...+70 °C • I/O device -40 ... +xx °C <sup>5)6)</sup>	
<b>Icotek cable entry</b> in plastic, gray HN-24 frame	<b>3</b>
Ambient operating temperatures: • Surface casing -40...+70 °C • I/O device -40 ... +xx °C <sup>5)6)</sup>	

- 1) The supplied certificate is only valid for the empty enclosure.  
 2) The included certificate is valid for the supplied enclosure including the installed components.  
 3) Number of cable entries/signals depends on enclosure dimensions  
 4) Installing these components reduces the degree of protection for the enclosure to IP65  
 5) Maximum temperature depends on installed components.  
 6) Minus temperatures down to -40 °C when heater installed.  
 This takes up 2 slots for ET 200iSP modules.

**Note:**

Depending on the cables used, other types and sizes of cable entries can be fitted (on request).

## I/O systems

### SIMATIC ET 200 systems without control cabinet

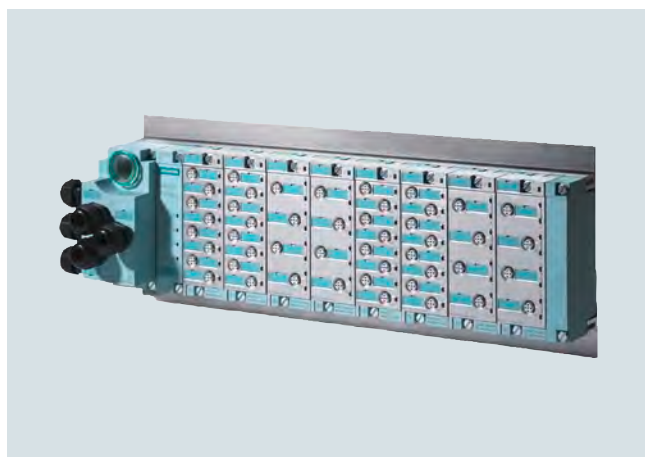
#### SIMATIC ET 200pro

#### Overview



SIMATIC ET 200pro video

[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6187716010001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6187716010001)



- SIMATIC ET 200pro distributed I/O system with IP65/67 degree of protection for cabinet-free use at the machine
- Small, multifunctional complete solution: Digital inputs/outputs, fail-safe modules, motor starters up to 5.5 kW, etc.
- Communication over PROFIBUS or PROFINET
- Mixed arrangement of fail-safe and standard modules in the same station
- Freely selectable connection technique: direct, ECOFAST or M12 7/8"
- Power module for easy implementation of load groups
- Module replacement during operation (hot swapping)
- Easy installation as well as permanent wiring
- Transmission rate for PROFIBUS DP up to 12 Mbps
- Extensive diagnostics: module-specific or channel-specific
- Intelligent motor starters for starting and protection of motors and loads up to 5.5 kW
  - Versions: direct and reversing starters - Standard and High Feature
- Safety motor starters
- Fail-safe modules with safety-related signal processing according to PROFIsafe
- Frequency converters
- RFID communications modules
- Pneumatic interface modules
- IO-Link master

#### Technical specifications

General technical specifications	
Electronic modules	<ul style="list-style-type: none"> <li>• Digital inputs/outputs</li> <li>• Analog inputs</li> <li>• Analog outputs</li> </ul>
Connections	M12 and M8 round connector with standard assignment for actuator/sensor
Transmission rate, max.	12 Mbps (PROFIBUS DP), 100 Mbps (PROFINET IO)
Supply voltage	24 V DC
Current consumption of ET 200pro (internal and sensor supply, non-switched voltage), up to 55 °C, max.	≤ 5 A
Load current for ET 200pro per incoming supply (IM, PM, switched voltage), up to 55 °C, max.	10 A
For overall configuration with looping through (multiple ET 200pros), up to 55 °C, max.	16 A (with terminal module, directly)
Degree of protection	IP65/66/IP67 for interface, digital and analog modules
Material	Thermoplastic (reinforced with glass fiber)
Ambient conditions	
Temperature	From -25 °C/0 °C to +55 °C
Relative humidity	From 5 to 100%
Air pressure	From 795 to 1080 hPa
Mechanical stress	
• Vibration	Vibration test according to IEC 60068, Part 2-6 (sinusoidal) <ul style="list-style-type: none"> <li>• Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules</li> <li>• 2 g motor starters</li> </ul>
• Shock	Shock test according to IEC 680068 Part 2-27, half-sine, 30 g, 18 ms duration for interface, digital and analog modules <ul style="list-style-type: none"> <li>• 15 g, 11 ms duration for motor starters</li> </ul>
Approvals	UL, CSA or cULus

## Overview



Interface modules for handling communication between the ET 200pro and the higher-level master over PROFIBUS DP.

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>IM154-1 interface module</b> For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP.	6ES7154-1AA01-0AB0	<b>PROFIBUS ECOFAST hybrid cable GP, pre-assembled</b> With 2 ECOFAST connectors, trailing-type cable with 2 x Cu 0.64 mm <sup>2</sup> and 4 x Cu 1.5 mm <sup>2</sup> , in various lengths:	
<b>IM154-2 DP High Feature interface module</b> For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP; supports PROFI-safe.	6ES7154-2AA01-0AB0	1.5 m	6XV1860-3PH15
<b>Accessories</b>		3.0 m	6XV1860-3PH30
<b>CM IM DP ECOFAST connection module</b> For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections.	6ES7194-4AA00-0AA0	5.0 m	6XV1860-3PH50
<b>CM IM DP direct connection module</b> For connecting PROFIBUS DP and the 24 V power supply directly to PROFIBUS interface modules, up to six M20 cable glands.	6ES7194-4AC00-0AA0	10 m	6XV1860-3PN10
<b>CM IM DP M12, 7/8" connection module</b> For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 x M12 and 2 x 7/8".	6ES7194-4AD00-0AA0	15 m	6XV1860-3PN15
<b>Accessories for CM IM DP ECOFAST</b>		20 m	6XV1860-3PN20
<b>PROFIBUS ECOFAST hybrid cable, pre-assembled</b> With 2 ECOFAST connectors, trailing-type cable with 2 x Cu 0.64 mm <sup>2</sup> and 4 x Cu 1.5 mm <sup>2</sup> , in various lengths:		<b>PROFIBUS ECOFAST hybrid cable, non-assembled</b> Trailing-type cable with 2 x Cu 0.64 mm <sup>2</sup> and 4 x Cu 1.5 mm <sup>2</sup> , sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-7AH10
1.5 m	6XV1830-7BH15	<b>PROFIBUS ECOFAST hybrid connector 180</b> ECOFAST Cu, 2 x Cu, 4 x 1.5 mm <sup>2</sup> , HANBRID connector	
3.0 m	6XV1830-7BH30	• With male insert, 5-pack	6GK1905-0CA00
5.0 m	6XV1830-7BH50	• With female insert, 5-pack	6GK1905-0CB00
10 m	6XV1830-7BN10	<b>PROFIBUS ECOFAST hybrid connector angular</b> ECOFAST Cu, 2 x Cu, 4 x 1.5 mm <sup>2</sup> , HANBRID connector	
15 m	6XV1830-7BN15	• With male insert, 5-pack	6GK1905-0CC00
20 m	6XV1830-7BN20	• With female insert, 5-pack	6GK1905-0CD00
		<b>Accessories for CM IM DP direct</b>	
		<b>PROFIBUS trailing cable</b>	6XV1830-3EH10
		Max. acceleration 4 m/s <sup>2</sup> , at least 3 million bending cycles, bending radius at least 60 mm, 2-wire shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro**Interface modules > IM 154-1 and IM 154-2**

Ordering data	Article No.	Article No.
<b>PROFIBUS FC Food bus cable</b> With PE sheath for use in the food and beverages industry, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1830-0GH10</b>	<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro.
<b>PROFIBUS FC Robust bus cable</b> With PUR sheath for use in environments subject to harsh chemicals and extreme mechanical stress, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1830-0JH10</b>	<b>Sealing cap 7/8"</b> For protection of unused 7/8" connections with ET 200pro; 10 units per pack.
<b>Power line</b> 5-wire, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1830-8AH10</b>	<b>General accessories</b>
<b>Accessories for CM IM DP M12, 7/8"</b>		<b>ET 200pro rack</b>
<b>PROFIBUS M12 connecting cable</b> Pre-assembled with two M12 connectors, 5-pin, in various lengths:		<ul style="list-style-type: none"> <li>Narrow, for interface, electronics and power modules <ul style="list-style-type: none"> <li>- 500 mm</li> <li>- 1 000 mm</li> <li>- 2 000 mm, can be cut to length</li> </ul> </li> <li>Compact, for interface, electronics and power modules <ul style="list-style-type: none"> <li>- 500 mm</li> <li>- 1 000 mm</li> <li>- 2 000 mm, can be cut to length</li> </ul> </li> <li>Wide, for interface, electronics, power modules and motor starters <ul style="list-style-type: none"> <li>- 500 mm</li> <li>- 1 000 mm</li> <li>- 2 000 mm, can be cut to length</li> </ul> </li> <li>Wide, for I/O modules and motor starters <ul style="list-style-type: none"> <li>- 500 mm</li> <li>- 1 000 mm</li> <li>- 2 000 mm</li> </ul> </li> </ul>
1.5 m	<b>6XV1830-3DH15</b>	<b>6ES7194-4GA00-0AA0</b>
2.0 m	<b>6XV1830-3DH20</b>	<b>6ES7194-4GA60-0AA0</b>
3.0 m	<b>6XV1830-3DH30</b>	<b>6ES7194-4GA20-0AA0</b>
5.0 m	<b>6XV1830-3DH50</b>	
10 m	<b>6XV1830-3DN10</b>	<b>6ES7194-4GC70-0AA0</b>
15 m	<b>6XV1830-3DN15</b>	<b>6ES7194-4GC60-0AA0</b>
		<b>6ES7194-4GC20-0AA0</b>
<b>7/8" connecting cable to power supply</b> 5-wire, 5 x 1.5 mm <sup>2</sup> , trailing type, pre-assembled with two 7/8" connectors, 5-pin, in various lengths:		<b>Spare fuse</b> 12.5 A fast-blow, for interface and power modules, 10 units per pack.
1.5 m	<b>6XV1822-5BH15</b>	<b>6ES7194-4HB00-0AA0</b>
2.0 m	<b>6XV1822-5BH20</b>	
3.0 m	<b>6XV1822-5BH30</b>	<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.
5.0 m	<b>6XV1822-5BH50</b>	<b>6XV1830-0EH10</b>
10 m	<b>6XV1822-5BN10</b>	
15 m	<b>6XV1822-5BN15</b>	<b>PROFIBUS hybrid standard cable GP</b> Standard PROFIBUS hybrid cable with 2 energy cables (1.5 mm <sup>2</sup> ) for supplying data and energy for ET 200pro.
<b>M12 connection plug</b> For ET 200eco, with axial cable outlet.		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication).
<ul style="list-style-type: none"> <li>With male insert, 5-pack</li> <li>With female insert, 5-pack</li> </ul>	<b>6GK1905-0EA00</b> <b>6GK1905-0EB00</b>	<b>6ES7998-8XC01-8YE0</b>
<b>PROFIBUS M12 bus termination connector</b> With male insert.	<b>6GK1905-0EC00</b>	<b>SIMATIC Manual Collection update service for 1 year</b> Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates.
<b>7/8" connection plug</b> For ET 200eco, with axial cable outlet.		
<ul style="list-style-type: none"> <li>With male insert, 5-pack</li> <li>With female insert, 5-pack</li> </ul>	<b>6GK1905-0FA00</b> <b>6GK1905-0FB00</b>	

**Technical specifications**

Article number	<b>6ES7154-1AA01-0AB0</b> ET 200pro, IM 154-1 DP	<b>6ES7154-2AA01-0AB0</b> ET 200pro, IM154-2 DP HF
<b>General information</b>		
Product type designation	IM 154-1 DP	IM 154-2 DP HF
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; over exchangeable fuses	Yes; over exchangeable fuses
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Input current</b>		
from supply voltage 1L+, max.	200 mA	200 mA
<b>Power loss</b>		
Power loss, typ.	5 W	5 W
<b>Address area</b>		
<b>Addressing volume</b>		
• Inputs	244 byte	244 byte
• Outputs	244 byte	244 byte
<b>Interfaces</b>		
Interfaces/bus type	PROFIBUS DP	PROFIBUS DP
<b>Interface types</b>		
<b>RS 485</b>		
• Transmission rate, max.	12 Mbit/s	12 Mbit/s
• automatic detection of transmission rate	Yes	Yes
<b>PROFIBUS DP</b>		
<b>Services</b>		
- SYNC capability	Yes	Yes
- FREEZE capability	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes	Yes
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostics indication LED</b>		
• For load voltage monitoring	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
<b>Parameter</b>		
DPV1 operation	possible	possible
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
Hot swapping of modules	possible	possible
<b>Potential separation</b>		
between supply voltage and electronics	Yes	Yes

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules &gt; IM 154-1 and IM 154-2

**Technical specifications**

Article number	<b>6ES7154-1AA01-0AB0</b> ET 200pro, IM 154-1 DP	<b>6ES7154-2AA01-0AB0</b> ET 200pro, IM154-2 DP HF
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
<b>Ambient temperature during storage/transportation</b>		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Dimensions</b>		
Width	90 mm	90 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
<b>Weights</b>		
Weight, approx.	375 g	375 g



## Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

## Ordering data

**IM 154-3 PN High Feature interface module**

For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFI-safe.

Connection module 6ES7194-4AK00-0AA0 must be ordered separately.

**IM 154-4 PN High Feature interface module**

For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFI-safe.

Order terminal module 6ES7194-4A .00-0AA0 separately.

**Accessories****Connection modules for IM 154-3 PN High Feature**

- **Connection module CM IM PN M12, 7/8" S** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"

**Connection modules for IM 154-4 PN High Feature**

- **Connection module CM IM PN M12, 7/8"** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"
- **Connection module CM IM PN 2xRJ45** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector
- **Connection module CM IM PN 2xSCRJ FO** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector

## Article No.

6ES7154-3AB00-0AB0

6ES7154-4AB10-0AB0

6ES7194-4AK00-0AA0

6ES7194-4AJ00-0AA0

6ES7194-4AF00-0AA0

6ES7194-4AG00-0AA0

## Article No.

**M12 sealing cap**

For protection of unused M12 connections with ET 200pro.

**IE M12 connecting cables**

Pre-assembled with two M12 connectors, up to 85 m, in various lengths:

0.3 m

0.5 m

1.0 m

1.5 m

2.0 m

3.0 m

5.0 m

10 m

15 m

Other special lengths with 90° or 180° cable outlet.

**7/8" sealing caps**

1 pack = 10 units

**7/8" connecting cable to power supply**

5-wire, 5 x 1.5 mm<sup>2</sup>, trailing type, pre-assembled with two 7/8" connectors, 5-pin, up to 50 m, in various lengths:

1.5 m

2.0 m

3.0 m

5.0 m

10 m

15 m

Other special lengths with 90° or 180° cable outlet.

3RX9802-0AA00

6XV1870-8AE30

6XV1870-8AE50

6XV1870-8AH10

6XV1870-8AH15

6XV1870-8AH20

6XV1870-8AH30

6XV1870-8AH50

6XV1870-8AN10

6XV1870-8AN15

See <http://support.automation.siemens.com/WW/view/en/26999294>

6ES7194-3JA00-0AA0

6XV1822-5BH15

6XV1822-5BH20

6XV1822-5BH30

6XV1822-5BH50

6XV1822-5BN10

6XV1822-5BN15

See <http://support.automation.siemens.com/WW/view/en/26999294>

**I/O systems**

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

**Interface modules > IM 154-3 PN and IM 154-4 PN**

Ordering data	Article No.	Article No.
<b>Power line</b> 5-wire, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1830-8AH10</b>	
<b>7/8" connection plug</b> For ET 200eco, with axial cable outlet. • With male insert, 5-pack • With female insert, 5-pack	<b>6GK1905-0FA00</b> <b>6GK1905-0FB00</b>	
<b>Industrial Ethernet FastConnect installation cables</b> • <b>IE FC TP standard cable GP 2 x 2</b> : Sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m. • <b>IE FC TP trailing cable 2 x 2</b> : sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m. • <b>IE FC TP trailing cable GP 2 x 2</b> : sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m. • <b>IE TP torsion cable GP 2 x 2</b> : sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m. • <b>IE FC TP marine cable 2 x 2</b> : sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	<b>6XV1840-2AH10</b>  <b>6XV1840-3AH10</b>  <b>6XV1870-2D</b>  <b>6XV1870-2F</b>  <b>6XV1840-4AH10</b>	
<b>IE RJ45 Plug PRO</b> RJ45 plug connector in IP65/67 degree of protection for on-site assembly, plastic housing, insulation displacement connection system, for SCALANCE X-200 IRT PRO and ET 200pro: 1 pack = 1 unit.	<b>6GK1901-1BB10-6AA0</b>	
<b>IE SC RJ POF Plug PRO</b> SC RJ plug for POF fibers in IP65/67 degree of protection, for on-site assembly, plastic housing, for SCALANCE X-200 IRT PRO and ET 200pro 1 pack = 1 unit	<b>6GK1900-0MB00-6AA0</b>	
<b>IE SC RJ PCF Plug PRO</b> SC RJ plug for PCF fibers in IP65/67 degree of protection, for on-site assembly, plastic housing, for SCALANCE X-200 IRT PRO 1 pack = 1 unit.	<b>6GK1900-0NB00-6AA0</b>	
<b>Power Plug PRO</b> 5-pin power plug for 2 x 24 V power supply in IP65/67 degree of protection, for on-site assembly, plastic housing, for SCALANCE X-200 IRT and ET 200 pro 1 pack = 1 unit.	<b>6GK1907-0AB11-6AA0</b>	
		<b>IE panel feed-through</b> Control cabinet feed-through for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20) • 1 pack = 5 units <b>6GK1901-0DM20-2AA5</b>
		<b>Push-pull connection plug</b> For 1L+/ 2L+, unassembled <b>6GK1907-0AB11-6AA0</b>
		<b>Cover caps for push-pull RJ45 female connectors</b> 5 items per pack <b>6ES7194-4JD50-0AA0</b>
		<b>Cover caps for push-pull female connectors power (1L+, 2L+)</b> 5 units <b>6ES7194-4JA50-0AA0</b>
		<b>General accessories</b>
		<b>ET 200pro rack</b> • Narrow, for interface, electronics and power modules - 500 mm - 1 000 mm - 2 000 mm, can be cut to length • Compact, for interface, electronics and power modules - 500 mm - 1 000 mm - 2 000 mm, can be cut to length • Wide, for interface, electronics, power modules and motor starters - 500 mm - 1 000 mm - 2 000 mm, can be cut to length • Wide, for I/O modules and motor starters - 500 mm - 1 000 mm - 2 000 mm
		<b>Spare fuse</b> 12.5 A fast-blow, for interface and power modules, 10 units per pack. <b>6ES7194-4GB00-0AA0</b> <b>6ES7194-4GB60-0AA0</b> <b>6ES7194-4GB20-0AA0</b>
		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC <b>6ES7194-4GC70-0AA0</b> <b>6ES7194-4GC60-0AA0</b> <b>6ES7194-4GC20-0AA0</b>
		<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates <b>6ES7194-4GD00-0AA0</b> <b>6ES7194-4GD10-0AA0</b> <b>6ES7194-4GD20-0AA0</b>
		<b>SIMATIC Manual Collection</b> <b>6ES7998-8XC01-8YE0</b>
		<b>SIMATIC Manual Collection update service for 1 year</b> <b>6ES7998-8XC01-8YE2</b>

### Technical specifications

Article number	<b>6ES7154-3AB00-0AB0</b>	<b>6ES7154-4AB10-0AB0</b>
	ET 200pro, IM 154-3 PN HF	ET 200pro, IM 154-4 PN HF
<b>General information</b>		
Product type designation	IM 154-3 PN HF	IM 154-4 PN HF
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Input current</b>		
from supply voltage 1L+, max.	300 mA	400 mA; Dependent on terminal module, typ. maximum value for FO connection method, full load on RWB and 20.4 V input voltage
<b>Power loss</b>		
Power loss, typ.	5 W	6 W; dependent on terminal module, typ. maximum value for CU connection method, full load on RWB, for FO the value is approx. 0.7 W higher
<b>Address area</b>		
<b>Addressing volume</b>		
• Inputs	256 byte	256 byte
• Outputs	256 byte	256 byte
<b>Interfaces</b>		
Interfaces/bus type	PROFINET IO	PROFINET IO
<b>M12 port</b>		
• Autonegotiation	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
<b>Protocols</b>		
<b>Protocols (Ethernet)</b>		
• SNMP	Yes	Yes
• LLDP	Yes	
• ping	Yes	Yes
• ARP	Yes	Yes
<b>Redundancy mode</b>		
<b>Media redundancy</b>		
- MRP	Yes	Yes
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostics indication LED</b>		
• MAINT LED	Yes	Yes
• LINK LED	Yes	Yes
• RX/TX LED	Yes	Yes
• For load voltage monitoring	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
<b>Parameter</b>		
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
Hot swapping of modules	possible	possible

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules &gt; IM 154-3 PN and IM 154-4 PN

**Technical specifications**

Article number	<b>6ES7154-3AB00-0AB0</b> ET 200pro, IM 154-3 PN HF	<b>6ES7154-4AB10-0AB0</b> ET 200pro, IM 154-4 PN HF
<b>Potential separation</b>		
between backplane bus and electronics	No	No
between supply voltage and electronics	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
<b>Ambient temperature during storage/transportation</b>		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Dimensions</b>		
Width	90 mm	135 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
<b>Weights</b>		
Weight, approx.	375 g	490 g

## Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
  - Standard modules with module-specific diagnostics
  - High Feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8 DI and 8 DO module by selecting CM IO 4 x M12 or CM IO 8 x M12
- IO connection modules are available in metal and plastic versions

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>8 DI digital input module</b> 24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AA0	<b>Accessories</b>	
<b>8 DI High Feature digital input module</b> 24 V DC, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AB0	<b>CM IO 4 x M12 connection module</b> 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	6ES7194-4CA00-0AA0
<b>16 DI digital input module</b> 24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES794-4CB50-0AA0 must be ordered separately	6ES7141-4BH00-0AA0	<b>CM IO 4 x M12 inverse connection module</b> 4 M12 sockets for connection of digital actuators to ET 200pro (4 DQ and 4 DQ HF); 2 x M12 single assignment, 2 x M12 double assignment	6ES7194-4CA50-0AA0
<b>4 DQ digital output module</b> 24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AA0	<b>CM IO 4 x M12 P connection module</b> 4 M12 sockets for connecting digital sensors/actuators to ET 200pro; plastic version	6ES7194-4CA10-0AA0
<b>4 DQ High Feature digital output module</b> 24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AB0	<b>CM IO 8 x M12 connection module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB00-0AA0
<b>8 DQ digital output module</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BF00-0AA0	<b>CM IO 8 x M12 P connection module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro; plastic version	6ES7194-4CB10-0AA0
<b>4 DI/4 DQ digital input and output module</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF50-0AA0	<b>CM IO 8 x M12D connection module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB50-0AA0
<b>Digital input and output module 4 DIQ / 4 DQ</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF00-0AA0	<b>CM IO 8 x M8 connection module</b> 8 sockets M8 for connection of digital sensors or actuators to ET 200pro	6ES7194-4EB00-0AA0
		<b>CM IO 2 x M12 connection module</b> 2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DQ, 24 V DC/0.5 A	6ES7194-4FB00-0AA0
		<b>CM IO 1 x M23 connection module</b> 1 M23 socket; for use with: EM 8 DI, 24 V DC and 8 DQ, 24 V DC/0.5 A	6ES7194-4FA00-0AA0

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro**I/O modules > Digital expansion modules**

Ordering data	Article No.	Article No.
<b>Module identification labels</b> For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	<b>6ES7194-4HA00-0AA0</b>	<b>M12 Y cable</b> For double connection of I/O by means of a single cable on ET 200, 5-pin
<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro	<b>3RX9802-0AA00</b>	<b>M8 sealing cap</b> For IP67 modules
<b>M12 Y circular connector</b> For double connection of sensors via a single cable, 5-pin; cannot be used for F-DI 4/8	<b>6ES7194-1KA01-0XA0</b>	<b>6ES7194-6KA00-0XA0</b>
		<b>3RK1901-1PN00</b>

**Technical specifications**

Article number	<b>6ES7141-4BF00-0AA0</b> ET 200pro, EM 8DI 24V DC	<b>6ES7141-4BF00-0AB0</b> ET 200pro, EM 8DI 24V DC HF	<b>6ES7141-4BH00-0AA0</b> ET 200pro, EM 16DI DC 24V
<b>General information</b>			
<b>Product function</b>			
• Isochronous mode	No	No	No
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Input current</b>			
from supply voltage 1L+, max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	20 mA	20 mA
<b>Encoder supply</b>			
Number of outputs	8	8	8
Short-circuit protection	Yes; per module, electronic	Yes; per channel, electronic	Yes; per module, electronic
<b>Output current</b>			
• up to 55 °C, max.	1 A	1 A	1 A
<b>Digital inputs</b>			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	No	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	Yes	
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b>			
- up to 55 °C, max.	8	8	16
<b>Input voltage</b>			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	+11 to +30V	+11 to +30V
<b>Input current</b>			
• for signal "1", typ.	7 mA	7 mA	4 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- parameterizable	No	Yes	No
<b>Cable length</b>			
• unshielded, max.	30 m	30 m	30 m
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
<b>Interrupts/diagnostics/status information</b>			
Diagnostics function	Yes	Yes; channel by channel, parameterizable	Yes

**Technical specifications**

Article number	<b>6ES7141-4BF00-0AA0</b> ET 200pro, EM 8DI 24V DC	<b>6ES7141-4BF00-0AB0</b> ET 200pro, EM 8DI 24V DC HF	<b>6ES7141-4BH00-0AA0</b> ET 200pro, EM 16DI DC 24V
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
• Hardware interrupt		Yes	
<b>Diagnoses</b>			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; Monitoring, I < 0.3 mA; per channel	
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; channel by channel	Yes; Sensor supply to M; module by module
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes; Per channel	Yes; Per channel	Yes; Per channel
<b>Potential separation</b>			
between backplane bus and all other circuit components	Yes	Yes	Yes
<b>Potential separation digital inputs</b>			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
<b>Dimensions</b>			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
<b>Weights</b>			
Weight, approx.	140 g	140 g	140 g
Article number	<b>6ES7142-4BD00-0AA0</b> ET 200pro, EM 4DO 24V DC/2.0A	<b>6ES7142-4BD00-0AB0</b> ET 200pro, EM 4DO 24VDC/2.0A HF	<b>6ES7142-4BF00-0AA0</b> ET 200pro, EM 8DO DC24V/0.5A
<b>Supply voltage</b>			
<b>Load voltage 2L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; against destruction; load increasing
<b>Input current</b>			
from load voltage 2L+ (without load), max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA	30 mA
<b>Digital outputs</b>			
Number of digital outputs	4	4	8
Short-circuit protection	Yes	Yes	Yes
Controlling a digital input	Yes	Yes	Yes; Isolation between 1L+ and 2L+ is no longer provided, as 1M and 2M are jumpered
<b>Switching capacity of the outputs</b>			
• on lamp load, max.	10 W	10 W	5 W
<b>Load resistance range</b>			
• lower limit	12 Ω	12 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
<b>Output current</b>			
• for signal "1" rated value	2 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
<b>Parallel switching of two outputs</b>			
• for uprating	No	No	No
• for redundant control of a load	Yes	Yes	Yes
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
<b>Total current of the outputs (per group)</b>			
<b>all mounting positions</b>			
- up to 55 °C, max.	4 A	4 A	4 A

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

**I/O modules > Digital expansion modules****Technical specifications**

Article number	<b>6ES7142-4BD00-0AA0</b> ET 200pro, EM 4DO 24V DC/2.0A	<b>6ES7142-4BD00-0AB0</b> ET 200pro, EM 4DO 24VDC/2.0A HF	<b>6ES7142-4BF00-0AA0</b> ET 200pro, EM 8DO DC24V/0.5A
<b>Cable length</b>			
• shielded, max.	30 m	30 m	30 m
• unshielded, max.	30 m	30 m	30 m
<b>Interrupts/diagnostics/ status information</b>			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable		Yes	
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnoses</b>			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; channel by channel	
• Short-circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; channel by channel	Yes; Short-circuit of outputs to ground; module by module
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes
• Channel fault indicator F (red)		Yes	
<b>Potential separation</b>			
between backplane bus and all other circuit components	Yes	Yes	Yes
<b>Potential separation digital outputs</b>			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes
<b>Highest safety class achievable for safety-related tripping of standard modules</b>			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2
<b>Dimensions</b>			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
<b>Weights</b>			
Weight, approx.	140 g	140 g	140 g
Article number	<b>6ES7143-4BF50-0AA0</b> ET 200pro, EM 4DI / 4DO DC 24V, 0.5A	<b>6ES7143-4BF00-0AA0</b> ET 200pro, EM 4 DIO / 4 DO DC 24V, 0.5A	
<b>Supply voltage</b>			
Rated value (DC)		24 V	
Reverse polarity protection		Yes; Against destruction; encoder power supply outputs applied with reversed polarity	
<b>Load voltage 2L+</b>			
• Rated value (DC)	24 V	24 V	
• Short-circuit protection	Yes	Yes	
• Reverse polarity protection	Yes	Yes; against destruction; load increasing	
<b>Input current</b>			
from supply voltage 1L+, max.		20 mA	
from load voltage 2L+ (without load), max.	20 mA	20 mA	
from backplane bus 3.3 V DC, max.	20 mA	30 mA	
<b>Encoder supply</b>			
Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	
<b>Output current</b>			
• up to 55 °C, max.	1 A	1 A	



**Technical specifications**

Article number	<b>6ES7143-4BF50-0AA0</b> ET 200pro, EM 4DI / 4DO DC 24V, 0.5A	<b>6ES7143-4BF00-0AA0</b> ET 200pro, EM 4 DIO / 4 DO DC 24V, 0.5A
<b>Digital inputs</b>		
Number of digital inputs	4	4; 4 DI0s can be parameterized
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
<b>Number of simultaneously controllable inputs</b>		
<b>all mounting positions</b>		
- up to 55 °C, max.		4
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal "1", typ.	7 mA	7 mA
<b>Cable length</b>		
• unshielded, max.	30 m	30 m
<b>Digital outputs</b>		
Number of digital outputs	4	8; 4 DO fixed, 4 DIO parameterizable
• in groups of		4; 2 load groups for 4 outputs each
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	Typ. (2L+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	5 W
<b>Load resistance range</b>		
• lower limit	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ
<b>Output current</b>		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
<b>Parallel switching of two outputs</b>		
• for uprating	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
<b>Total current of the outputs (per group)</b>		
<b>all mounting positions</b>		
- up to 55 °C, max.	2 A	2 A
<b>Cable length</b>		
• unshielded, max.	30 m	30 m
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnoses</b>		
• Diagnostic information readable	Yes	Yes
• Short-circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; Short-circuit of outputs to ground; module by module

**I/O systems**

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SIMATIC ET 200pro

**I/O modules > Digital expansion modules****Technical specifications**

Article number	<b>6ES7143-4BF50-0AA0</b> ET 200pro, EM 4DI / 4DO DC 24V, 0.5A	<b>6ES7143-4BF00-0AA0</b> ET 200pro, EM 4 DIO / 4 DO DC 24V, 0.5A
<b>Diagnostics indication LED</b>		
• Group error SF (red)		Yes
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
<b>Potential separation</b>		
between backplane bus and all other circuit components	Yes	Yes
<b>Potential separation digital inputs</b>		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
<b>Potential separation digital outputs</b>		
• between the channels	No	
• between the channels and backplane bus	Yes	Yes
<b>Standards, approvals, certificates</b>		
Suitable for safety-related tripping of standard modules		Yes
<b>Highest safety class achievable for safety-related tripping of standard modules</b>		
• Performance level according to ISO 13849-1		PL d
• Category according to ISO 13849-1		Cat. 3
• SILCL according to IEC 62061		SILCL 2
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
<b>Weights</b>		
Weight, approx.	140 g	140 g

### Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostics functionality, limit values and substitute values

### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>4AI U analog input module</b> High Feature, $\pm 10$ V; $\pm 5$ V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7144-4FF01-0AB0	<b>4AO U analog output module</b> High Feature, $\pm 10$ V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7145-4FF00-0AB0
<b>4AI I analog input module</b> High Feature, $\pm 20$ mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7144-4GF01-0AB0	<b>4AO I analog output module</b> High Feature, $\pm 20$ mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7145-4GF00-0AB0
<b>4AI RTD analog input module</b> High Feature; resistances: 150, 300, 600 and 3000 Ohm; resistance thermometer: Pt100, 200, 500, 1000, Ni100, 120, 200, 500 and 1000; channel-specific diagnostics, incl. bus module. Connection module must be ordered separately	6ES7144-4JF00-0AB0	<b>Accessories</b>	
<b>Analog input module 4AI TC</b> High Feature; thermocouples: Type B, E, J, K, L, N, R, S, T; voltage measurement $\pm 80$ mV; channel diagnostics, including bus module. Connection module must be ordered separately	6ES7144-4PF00-0AB0	<b>CM IO 4 x M12 connection module</b> 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	6ES7194-4CA00-0AA0
		<b>M12 compensation connectors</b> With integral Pt100 for reference point compensation when connecting thermocouples	6ES7194-4AB00-0AA0
		<b>Module identification labels</b> For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	6ES7194-4HA00-0AA0
		<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro	3RX9802-0AA00

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**I/O modules > Analog expansion modules****Technical specifications**

Article number	<b>6ES7144-4FF01-0AB0</b> ET 200pro, EM 4AI-U HF	<b>6ES7144-4GF01-0AB0</b> ET 200pro, EM 4AI-I HF	<b>6ES7144-4JF00-0AB0</b> ET 200pro, EM 4 AI-RTD HF	<b>6ES7144-4PF00-0AB0</b> ET 200pro, EM 4 AI-TC HF
<b>Supply voltage</b>				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction	Yes; against destruction	Yes; against destruction
<b>Input current</b>				
from supply voltage 1L+, max.	40 mA; Typical	40 mA; Typical	27 mA; Typical	34 mA; Typical
from backplane bus 3.3 V DC, max.	12 mA; Typical	12 mA; Typical	10 mA; Typical	20 mA; Typical
<b>Encoder supply</b>				
Number of outputs	4	4		
Short-circuit protection	Yes; per module, electronic to frame	Yes; per module, electronic to frame		
<b>Output current</b>				
• up to 55 °C, max.	1 A	1 A		
<b>Analog inputs</b>				
Number of analog inputs	4	4	4	4
permissible input voltage for voltage input (destruction limit), max.	35 V			20 V
permissible input current for current input (destruction limit), max.		40 mA		
Constant measurement current for resistance-type transmitter, typ.			1.25 mA; 1.25 / 0.5 mA depending on measuring range	
Cycle time (all channels) max.	5 ms	10 ms	83 ms; 83 ms at 50 Hz; 69 ms at 60 Hz	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable			Yes; Degrees Celsius/degrees Fahrenheit	Yes; °C/°F/K
<b>Input ranges (rated values), voltages</b>				
• 0 to +10 V	Yes			
• 1 V to 5 V	Yes			
• -10 V to +10 V	Yes			
• -5 V to +5 V	Yes			
• -80 mV to +80 mV				Yes
<b>Input ranges (rated values), currents</b>				
• 0 to 20 mA		Yes		
• -20 mA to +20 mA		Yes		
• 4 mA to 20 mA		Yes		
<b>Input ranges (rated values), thermocouples</b>				
• Type B				Yes
• Type E				Yes
• Type J				Yes
• Type K				Yes
• Type L				Yes
• Type N				Yes
• Type R				Yes
• Type S				Yes
• Type T				Yes
<b>Input ranges (rated values), resistance thermometer</b>				
• Cu 10			No	
• Ni 100			Yes	
• Ni 1000			Yes	
• Ni 120			Yes	
• Ni 200			Yes	
• Ni 500			Yes	
• Pt 100			Yes	
• Pt 1000			Yes	
• Pt 200			Yes	
• Pt 500			Yes	

**Technical specifications**

Article number	<b>6ES7144-4FF01-0AB0</b> ET 200pro, EM 4AI-U HF	<b>6ES7144-4GF01-0AB0</b> ET 200pro, EM 4AI-I HF	<b>6ES7144-4JF00-0AB0</b> ET 200pro, EM 4 AI-RTD HF	<b>6ES7144-4PF00-0AB0</b> ET 200pro, EM 4 AI-TC HF
<b>Input ranges (rated values), resistors</b>				
• 0 to 150 ohms			Yes	
• 0 to 300 ohms			Yes	
• 0 to 600 ohms			Yes	
• 0 to 3000 ohms			Yes	
<b>Thermocouple (TC)</b>				
<b>Temperature compensation</b>				
- internal temperature compensation				Yes
- external temperature compensation with compensations socket				Yes
<b>Characteristic linearization</b>				
• parameterizable			Yes	
- for resistance thermometer			Ptxxx, Nixxx	
<b>Cable length</b>				
• shielded, max.	30 m	30 m	30 m	30 m
<b>Analog value generation for the inputs</b>				
Measurement principle	integrating	integrating	integrating	integrating
<b>Integration and conversion time/resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	15 bit; 15 bit + sign at ±10 V, at ±5 V; 15 bit at 0 V to 10 V, at 1 V to 5 V	15 bit; 15 bit + sign at ±10 V, at ±5 V; 15 bit at 0 V to 10 V, at 1 V to 5 V	15 bit; at 150, 300, 600 and 3 000 ohms; otherwise 15 bits + sign	15 bit; + sign
• Integration time (ms)	0,3 / 16,7 / 20 / 60	0,3 / 16,7 / 20 / 60		
• Interference voltage suppression for interference frequency f1 in Hz	16,67 / 50 / 60 / 3 600	16,67 / 50 / 60 / 3 600		
• Conversion time (per channel)	1.1 ms	1.1 ms	20.625 ms; 20.625 ms at 50 Hz; 17.25 ms at 60 Hz	4.7/19/22/102 ms
<b>Smoothing of measured values</b>				
• parameterizable	Yes	Yes	Yes	Yes
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
• for voltage measurement	Yes			Yes
• for current measurement as 2-wire transducer		Yes		
• for current measurement as 4-wire transducer		Yes		
• for resistance measurement with two-wire connection			Yes; Line resistances are also measured	
• for resistance measurement with three-wire connection			Yes	
• for resistance measurement with four-wire connection			Yes	
<b>Errors/accuracies</b>				
Linearity error (relative to input range), (+/-)	0.0075 %	0.0075 %	0.05 %	0.01 %
Temperature error (relative to input range), (+/-)	0.00075 %/K	0.00075 %/K	0.002 %/K	0.0004 %/K; Positive temperature
Crosstalk between the inputs, min.	-70 dB	-70 dB	-50 dB	-90 dB; max.
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.004 %	0.004 %	0.015 %	0.01 %
<b>Operational error limit in overall temperature range</b>				
• Voltage, relative to input range, (+/-)	0.1 %			0.12 %; Positive temperature
• Current, relative to input range, (+/-)		0.1 %		
• Resistance thermometer, relative to input range, (+/-)			0.175 %	

**I/O systems**

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SIMATIC ET 200pro

**I/O modules > Analog expansion modules****Technical specifications**

Article number	<b>6ES7144-4FF01-0AB0</b> ET 200pro, EM 4AI-U HF	<b>6ES7144-4GF01-0AB0</b> ET 200pro, EM 4AI-I HF	<b>6ES7144-4JF00-0AB0</b> ET 200pro, EM 4 AI-RTD HF	<b>6ES7144-4PF00-0AB0</b> ET 200pro, EM 4 AI-TC HF
<b>Basic error limit (operational limit at 25 °C)</b>				
• Voltage, relative to input range, (+/-)	0.075 %			0.1 %
• Current, relative to input range, (+/-)		0.075 %		
• Resistance thermometer, relative to input range, (+/-)			0.125 %	
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>				
• Series mode interference (peak value of interference < rated value of input range), min.			50 dB	42 dB
• Common mode interference (USS < 2.5 V), min.			70 dB; Interference voltage < 5 V	85 dB; Interference voltage < 10 V
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 0.5 \%)</math>, <math>f_1 =</math> interference frequency</b>				
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB	60 dB		
• Common mode interference (USS < 2.5 V), min.	80 dB; Interference voltage < 10 V	80 dB; Interference voltage < 5 V		
<b>Interrupts/diagnostics/status information</b>				
Diagnostics function	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; (limit value alarm), can be parameterized for channel 0	Yes; (limit value alarm), can be parameterized for channel 0	No	No
<b>Diagnoses</b>				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire-break	Yes; at 1 to 5 V	Yes; at 4 to 20 mA	Yes	Yes
• Short-circuit	Yes; at 1 to 5 V	Yes; at 4 to 20 mA		
• Overflow/underflow			Yes	Yes
<b>Diagnostics indication LED</b>				
• Group error SF (red)	Yes	Yes	Yes	Yes
<b>Potential separation</b>				
<b>Potential separation analog inputs</b>				
• between the channels	No	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9				Yes; Based on AMS 2750 E
<b>Dimensions</b>				
Width	45 mm	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm	130 mm
Depth	35 mm	35 mm	35 mm	35 mm
<b>Weights</b>				
Weight, approx.	150 g	150 g	150 g	150 g

**Technical specifications**

Article number	<b>6ES7145-4FF00-0AB0</b> ET 200pro, EM 4AO-U HF	<b>6ES7145-4GF00-0AB0</b> ET 200pro, EM 4 AO-I HF
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Input current</b>		
from supply voltage 1L+, max.	65 mA	110 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA
<b>Actuator supply</b>		
Number of outputs	4	4
Short-circuit protection	Yes; per module	Yes; per module
<b>Output current</b>		
• up to 55 °C, max.	1 A	1 A
<b>Analog outputs</b>		
Number of analog outputs	4	4
Voltage output, short-circuit protection	Yes; per channel, electronic to chassis	Yes; per module, electronic to frame
Voltage output, short-circuit current, max.	50 mA	
Current output, no-load voltage, max.		16 V
Cycle time (all channels) max.	3 ms	3 ms
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
<b>Output ranges, current</b>		
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes
<b>Connection of actuators</b>		
• for voltage output two-wire connection	Yes	
• for voltage output four-wire connection	Yes	
• for current output two-wire connection		Yes
• for current output four-wire connection		Yes
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 000 Ω	
• with voltage outputs, capacitive load, max.	1 μF	
• with current outputs, max.		600 Ω
• with current outputs, inductive load, max.		1 mH
<b>Cable length</b>		
• shielded, max.	30 m	30 m
<b>Analog value generation for the outputs</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	15 bit; at -10 to +10 V; 14 bit at 1 to 5 V; 15 bit at 0 to 10 V	15 bit; at ±20 mA; 14 bit at 0 to 20 mA; 15 bit at 4 to 20 mA
• Conversion time (per channel)	0.7 ms	0.7 ms
<b>Settling time</b>		
• for resistive load	0.1 ms	0.1 ms
• for capacitive load	6 ms	
• for inductive load		1 ms

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro**I/O modules > Analog expansion modules****Technical specifications**

Article number	<b>6ES7145-4FF00-0AB0</b> ET 200pro, EM 4AO-U HF	<b>6ES7145-4GF00-0AB0</b> ET 200pro, EM 4 AO-I HF
<b>Errors/accuracies</b>		
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %	0.1 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %
<b>Operational error limit in overall temperature range</b>		
• Voltage, relative to output range, (+/-)	0.2 %	
• Current, relative to output range, (+/-)		0.2 %
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to output range, (+/-)	0.15 %	
• Current, relative to output range, (+/-)		0.15 %
<b>Interrupts/diagnostics/status information</b>		
Diagnostics function		Yes
Substitute values connectable	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No
<b>Diagnoses</b>		
• Diagnostic information readable	Yes	Yes
• Wire-break	No	Yes; per channel, not in zero range
• Short-circuit	Yes; per channel, not in zero range	No
<b>Diagnostics indication LED</b>		
• Group error SF (red)	Yes	Yes
<b>Potential separation</b>		
<b>Potential separation analog outputs</b>		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
<b>Weights</b>		
Weight, approx.	150 g	150 g



**Overview**

- 45 mm wide 4 IO-LINK HF electronic module
- 4 IO-Link ports according to IO-Link specification V1.1
- Port Class B
- The IO-Link parameters are configured using the Port Configuration Tool (S7-PCT), version V3.4 and higher

**Ordering data****Article No.**

<b>4 IO-Link HF electronic module</b>	<b>6ES7147-4JD00-0AB0</b>
4 IO-Link ports according to IO-Link specification V1.1, port Class B; High Feature, channel-specific diagnostics, including bus module. Connection module must be ordered separately	
<b>Accessories</b>	
<b>CM IO-Link 4 x M12 P connection module</b>	<b>6ES7194-4CA20-0AA0</b>
4 M12 sockets for connecting IO-Link devices to ET 200pro electronic module 4 IO-Link HF	
<b>Module identification labels</b>	<b>6ES7194-4HA00-0AA0</b>
For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	
<b>M12 sealing cap</b>	<b>3RX9802-0AA00</b>
For protection of unused M12 connections with ET 200pro	

**Technical specifications**

Article number	<b>6ES7147-4JD00-0AB0</b> ET200pro, EM 4 IO-Link HF
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction; load increasing
<b>Input current</b>	
from supply voltage 1L+, max.	40 mA
from load voltage 2L+ (without load), max.	20 mA
from backplane bus 3.3 V DC, max.	20 mA
<b>Encoder supply</b>	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
<b>Output current</b>	
• up to 55 °C, max.	2 A

Article number	<b>6ES7147-4JD00-0AB0</b> ET200pro, EM 4 IO-Link HF
<b>IO-Link</b>	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Size of process data, input per port	32 byte
Size of process data, input per module	32 byte
Size of process data, output per port	32 byte
Size of process data, output per module	32 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	Possible with function block IO_LINK_MASTER
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
<b>Operating modes</b>	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
<b>Connection of IO-Link devices</b>	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: for X1 and X2 max. 2 A in total, for X3 and X4 max. 2 A in total
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; One green LED for channel status Qn (SIO mode) and port status IO-Ln (IO-Link mode)
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes; combined with the IO-Link port status
<b>Potential separation</b>	
between the load voltages	Yes
between backplane bus and all other circuit components	Yes
<b>Potential separation channels</b>	
• between the channels	No
<b>Standards, approvals, certificates</b>	
Suitable for safety-related tripping of standard modules	No
<b>Dimensions</b>	
Width	45 mm
Height	130 mm
Depth	35 mm
<b>Weights</b>	
Weight, approx.	150 g

## I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Fail-safe expansion modules > Fail-safe digital expansion modules

### Overview



Fail-safe digital inputs/outputs with IP65/66/67 degree of protection for application on the machine level without control cabinet.

#### Fail-safe digital inputs

- For fail-safe reading of sensor information (1 or 2 channels)
- Provide integral discrepancy evaluation for 2-out-of-2 signals
- Internal sensor supplies (incl. test function) available

#### Fail-safe digital outputs

- Fail-safe 2-channel activation (switching to P/M potential) of actuators
- Actuators can be driven by up to 2 A

All modules are certified up to SIL 3 (IEC 61508) and feature detailed diagnostics.

The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with IM151-7 F-CPU, CPU31xF-2 DP, CPU31xF-2 PN/DP and CPU416F-2.

### Ordering data

### Article No.

#### Fail-safe digital input module 8/16 F-DI PROFIsafe

6ES7148-4FA00-0AB0

24 V DC, including bus module.  
Connection module must be ordered separately

#### Fail-safe digital input/output module 4/8 F-DI, 4 F-DO 2 A

6ES7148-4FC00-0AB0

24 V DC, including bus module.  
Connection module must be ordered separately

#### Fail-safe electronic module F-Switch PROFIsafe

6ES7148-4FS00-0AB0

Three fail-safe switching to PP potential outputs for safe switching of the rear panel busbar (2L+, F0, F1);  
two fail-safe digital inputs, 45 mm; usable up to SIL3 (IEC 61508)

#### Accessories

##### Connection module

6ES7194-4DA00-0AA0

For the fail-safe electronic module F-Switch PROFIsafe

##### Connection module

6ES7194-4DC00-0AA0

For the fail-safe electronic module 4/8 F-DI/4 F-DO, 24 V DC/2 A

##### Connection module

6ES7194-4DD00-0AA0

For the fail-safe electronic module 8/16 F-DI, 24 V DC

#### PROFIBUS DP interface module IM154-2

6ES7154-2AA01-0AB0

Including termination module

#### PROFINET interface module IM154-4 PN

6ES7154-4AB10-0AB0

Including termination module

#### M12 sealing cap

3RX9802-0AA00

For protection of unused M12 connections with ET 200pro

## Technical specifications

Article number	<b>6ES7148-4FA00-0AB0</b>		Article number	<b>6ES7148-4FA00-0AB0</b>	
	ET200PRO, EI-Mod., 8/16 F-DI 24V DC			ET200PRO, EI-Mod., 8/16 F-DI 24V DC	
<b>Supply voltage</b>			<b>Standards, approvals, certificates</b>		
Rated value (DC)	24 V		<b>Highest safety class achievable in safety mode</b>		
Reverse polarity protection	Yes		• Performance level according to ISO 13849-1	e	
<b>Digital inputs</b>			<b>Dimensions</b>		
Number of digital inputs	16		Width	90 mm	
<b>Input current</b>			Height	130 mm	
• for signal *1*, typ.	3.7 mA		Depth	65 mm	
Article number	<b>6ES7148-4FC00-0AB0</b>	<b>6ES7148-4FS00-0AB0</b>			
	ET200PRO, EI-Mod., 4/8 F-DI/4 F-DO 24VDC/2A	ET200PRO, EI-Mod., F-Switch PROFIsafe			
<b>Supply voltage</b>					
Rated value (DC)	24 V	24 V			
<b>Digital inputs</b>					
Number of digital inputs	8	2			
<b>Input current</b>					
• for signal *1*, typ.	3.7 mA	3.5 mA			
<b>Digital outputs</b>					
Number of digital outputs	4	3			
Short-circuit protection	Yes	Yes			
<b>Output current</b>					
• for signal *1* rated value	2 A				
<b>Dimensions</b>					
Width	90 mm	45 mm			
Height	130 mm	130 mm			
Depth	65 mm	65 mm			

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules &gt; PM-E power module

**Overview**

PM-E 24 V DC power module

**Ordering data****PM-E 24 V DC power module**

For backfeed and group formation of the 24 V DC load voltage for electronic modules within an ET 200pro station.

**Accessories****CM PM-E ECOFAST connection module**

For backfeed of 24 V load voltage, 1 ECOFAST Cu connection

**CM PM-E direct connection module**

For backfeed of 24 V load voltage, up to 2 M20 screwed cable glands

**CM PM-E 7/8" connection module**

For backfeed of 24 V load voltage, 1 x 7/8"

**CM PM-E PP connection module**

For supplying 24 V load voltage, 2 x push-pull, with spare fuse

**Spare fuse**

12.5 A quick-response, for interface and power modules, 10 items per package unit

**Article No.****6ES7148-4CA00-0AA0****6ES7194-4BA00-0AA0****6ES7194-4BC00-0AA0****6ES7194-4BD00-0AA0****6ES7194-4BE00-0AA0****6ES7194-4HB00-0AA0****Article No.****PROFIBUS ECOFAST hybrid cable, copper**

Trailing-type cable (PUR sheath), with two shielded Cu wires for PROFIBUS DP plus four Cu wires of 1.5 mm<sup>2</sup>, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m

Preassembled with ECOFAST male and female connector, fixed length

- 1.5 m
- 3 m
- 5 m
- 10 m
- 15 m
- 20 m

**6XV1830-7AH10**

**6XV1830-7BH15**  
**6XV1830-7BH30**  
**6XV1830-7BH50**  
**6XV1830-7BN10**  
**6XV1830-7BN15**  
**6XV1830-7BN20**

**PROFIBUS ECOFAST hybrid cable, GP**

Trailing-type cable with 4 x copper cores and 2 x copper cores, shielded, with UL approval

Preassembled with ECOFAST male and female connector

- 1.5 m
- 3 m
- 5 m
- 10 m
- 15 m
- 20 m

**6XV1860-3PH15**  
**6XV1860-3PH30**  
**6XV1860-3PH50**  
**6XV1860-3PN10**  
**6XV1860-3PN15**  
**6XV1860-3PN20**

10

Ordering data	Article No.	Ordering data	Article No.
<b>ECOFAST connection plug, for user assembly</b> Female connector; ordering unit 5 items	<b>6GK1905-0CB00</b>	<b>Accessories for CM PM-E 7/8"</b>	
<b>PROFIBUS ECOFAST hybrid plug, angled</b> With 2 x shielded copper cores and 4 x 1.5 mm <sup>2</sup> copper cores; 5 items; with assembly instructions; female insert	<b>6GK1905-0CD00</b>	<b>7/8" connecting cable to power supply</b> 5-wire, 5 x 1.5 mm <sup>2</sup> , trailing type, preassembled with two 7/8" connectors, 5-pin • 1.5 m long • 2.0 m long • 3.0 m long • 5.0 m long • 10 m long • 15 m long	<b>6XV1822-5BH15</b> <b>6XV1822-5BH20</b> <b>6XV1822-5BH30</b> <b>6XV1822-5BH50</b> <b>6XV1822-5BN10</b> <b>6XV1822-5BN15</b>
<b>Push-pull connection plug</b> For 1L+/ 2L+, unassembled	<b>6GK1907-0AB11-6AA0</b>	<b>7/8" connection plug</b> With axial cable outlet • with female insert, 5 per pack	<b>6GK1905-0FB00</b>
<b>Cover caps for push-pull female connectors</b> 5 units	<b>6ES7194-4JA50-0AA0</b>		
<b>Accessories for CM PM-E direct</b>			
<b>Power line</b> 5-wire, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	<b>6XV1830-8AH10</b>		

### Technical specifications

Article number	<b>6ES7148-4CA00-0AA0</b> ET 200pro, PM-E 24V DC
<b>Supply voltage</b>	
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• Short-circuit protection	Yes; via an exchangeable fuse in the power module
• Reverse polarity protection	Yes; against destruction
<b>Input current</b>	
from load voltage 2L+, max.	3 mA
<b>Current carrying capacity</b>	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
<b>Power loss</b>	
Power loss, typ.	0.1 W
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• missing load voltage	Yes
<b>Diagnostics indication LED</b>	
• For load voltage monitoring	Yes
• Group error SF (red)	Yes

Article number	<b>6ES7148-4CA00-0AA0</b> ET 200pro, PM-E 24V DC
<b>Parameter</b>	
missing load voltage	Potential group of the power module
<b>Potential separation</b>	
between load voltage and backplane bus	Yes
<b>Dimensions</b>	
Width	45 mm
Height	130 mm
Depth	35 mm
<b>Weights</b>	
Weight, approx.	140 g

**I/O systems**

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

**I/O modules > PM-O power module output****Overview**

PM-O 2 x 24 V DC power module with CM PM-O PP

PM-O 2x 24 V DC power module

**Ordering data****Article No.****PM-O 2 x 24 V DC power module****6ES7148-4CA60-0AA0**

For drawing the 24 V load voltage 2L+ and electronic/encoder supply voltage 1L+ within an ET 200pro station.

**Accessories****CM PM-O PP connection module****6ES7194-4BH00-0AA0**

For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector

**Article No.****Push-pull cable connector****6GK1907-0AB11-6AA0**

For 1L+/ 2L+, unassembled

**Cover caps for Push-Pull female connectors****6ES7194-4JA50-0AA0**

5 units

**Technical specifications**

Article number	<b>6ES7148-4CA60-0AA0</b> ET200PRO, PM-O DC 2x24V
<b>Supply voltage</b>	
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
<b>Input current</b>	
from load voltage 2L+, max.	3 mA
<b>Current carrying capacity</b>	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
<b>Power loss</b>	
Power loss, typ.	1.1 W
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• missing load voltage	No
<b>Diagnostics indication LED</b>	
• For load voltage monitoring	No; Signalled in IM or in PM
• Group error SF (red)	Yes

Article number	<b>6ES7148-4CA60-0AA0</b> ET200PRO, PM-O DC 2x24V
<b>Parameter</b>	
Diagnostics short-circuit	Diagnosis short circuit implemented after M for 1L+
<b>Potential separation</b>	
between load voltage and backplane bus	Yes
<b>Dimensions</b>	
Width	45 mm
Height	130 mm
Depth	35 mm
<b>Weights</b>	
Weight, approx.	150 g

## Overview



- Interface for holding an original FESTO CPV 10 or CPV 14 compact performance valve terminal
- For using ET 200pro in applications with flexible pneumatics
- Highly flexible pneumatics due to a variety of valve functions and choice of flow rates

## Ordering data

## EM 148-P pneumatic interface

DO 16 x P/CPV 10 for direct accommodation of FESTO valve terminal CPV 10 16 DO x P

DO 16 x P/CPV 14 for direct accommodation of FESTO valve terminal CPV 14 16 DO x P

## Article No.

6ES7148-4EA00-0AA0

6ES7148-4EB00-0AA0

## Article No.

FESTO CPV 10 valve terminal

FESTO CPV 14 valve terminal

available from FESTO

available from FESTO

FESTO AG & Co  
Ruiterstr. 82  
D-73732 Esslingen

More addresses  
on the Internet at:  
<http://www.festo.de>

## Technical specifications

Article number	6ES7148-4EA00-0AA0	6ES7148-4EB00-0AA0
	ET200PRO, 16DO,Pneumatic Interface CPV10	ET200PRO, 16DO,Pneumatic Interface CPV14
<b>Supply voltage</b>		
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V	24 V
• Short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes
<b>Input current</b>		
from load voltage 2L+, max.	300 mA; Including valves	370 mA; Including valves
from backplane bus 3.3 V DC, max.	25 mA	25 mA
<b>Power loss</b>		
Power loss, typ.	2.6 W	3.7 W
<b>Address area</b>		
<b>Address space per module</b>		
• Address space per module, max.	2 byte	2 byte
<b>Digital outputs</b>		
Number of digital outputs	16	16
<b>Load resistance range</b>		
• lower limit	500 Ω	500 Ω
• upper limit	2 500 Ω	2 500 Ω
<b>Output current</b>		
• for signal "1" rated value	12 mA	16 mA
<b>Switching frequency</b>		
• with inductive load, max.	25 Hz	20 Hz
<b>Total current of the outputs (per group)</b>		
<b>all mounting positions</b>		
- up to 55 °C, max.	250 mA; only up to 50 °C, limited by valves	330 mA; only up to 50 °C, limited by valves

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

**I/O modules > ET 200pro pneumatic interface****Technical specifications**

Article number	<b>6ES7148-4EA00-0AA0</b>	<b>6ES7148-4EB00-0AA0</b>
	ET200PRO, 16DO,Pneumatic Interface CPV10	ET200PRO, 16DO,Pneumatic Interface CPV14
<b>Interrupts/diagnostics/ status information</b>		
Diagnostics function	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnoses</b>		
• Diagnostic information readable	Yes	Yes
<b>Diagnostics indication LED</b>		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
<b>Pneumatics</b>		
Number of connectable valves, max.	16	16
permissible working pressure, min.	3 bar	3 bar
permissible working pressure, max.	8 bar	8 bar
Rated flow rate	400 l/min	800 l/min
<b>Parameter</b>		
Remark	Diagnosis load voltage 2L+	Diagnosis load voltage 2L+
Response to CPU/master STOP	No	
<b>Standards, approvals, certificates</b>		
Suitable for safety-related tripping of standard modules	Yes	Yes
<b>Highest safety class achievable for safety-related tripping of standard modules</b>		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2
<b>Dimensions</b>		
Width	90 mm	120 mm
Height	130 mm	152 mm
Depth	47 mm	47 mm



## Overview



The SIMATIC RF170C is a communications module for connecting the SIMATIC identification systems to the ET 200pro distributed I/O system. The readers of all RFID systems as well as the MV400 optical readers and MV300 optical handheld readers can be operated on the RF170C. In addition, the RF170C provides a universal RS232/RS422 interface for connecting devices using the Freeprot protocol.

Thanks to the high degree of protection and ruggedness, ET 200pro is particularly suitable for machine-level use. The modular structure with PROFIBUS and PROFINET connection systems allows it to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

## Ordering data

**SIMATIC RF170C communications module**

For connecting to the ET 200pro distributed I/O system

## Article No.

6GT2002-0HD01

**Accessories****Connection block for SIMATIC RF170C**

For connecting 2 readers or other RS422/RS232 devices via an M12 connector

6GT2002-1HD01

**Reader cable for SIMATIC RF200 / RF300 / RF600 / MV440**

Or MOBY D extension cable and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, trailable

2 m, straight plug

6GT2891-4FH20

5 m, straight plug

6GT2891-4FH50

10 m, straight plug

6GT2891-4FN10

20 m, straight plug

6GT2891-4FN20

50 m, straight plug

6GT2891-4FN50

2 m, plug angled at reader

6GT2891-4JH20

5 m, plug angled at reader

6GT2891-4JH50

10 m, plug angled at reader

6GT2891-4JN10

## Article No.

**Connecting cable for SIMATIC RF1000**

Prefabricated RS232, between RF1040R or RF1070R and a communications module; black, length 2 m

6GT2891-4UH20

**Reader cable for MV300 handheld readers**

Coiled cable with usable length of 1.6 m to 4 m for MV320, PUR material

6GT2191-0BH50

**Plug for connection of other RS422/RS232 devices**

8-pole M12 plug, male, screw connections for wires up to 0.5 mm<sup>2</sup>. Order quantity 1 pack with 5 units

6GT2090-0BE00

**M12 sealing caps for unused reader connections**

Minimum order quantity 10 units, price per 100 units

3RX9802-0AA00

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

**I/O modules > RF170C****Technical specifications**

Article number	<b>6GT2002-0HD01</b>
product type designation	RF170C communications module
suitability for operation	ET 200pro distributed I/O together with RF200/300/1000, MV300/400/500, MOBY D/E//U and RS-232 devices
<b>transfer rate</b>	
transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
<b>interfaces</b>	
design of the interface for point-to-point connection	RS422/RS232 via connection block
number of readers connectable	2
type of electrical connection	
• of the backplane bus	ET 200pro backplane bus
• of the PROFIBUS interface	(according to the head module)
• of Industrial Ethernet interface	(according to the head module)
• for supply voltage	ET 200pro backplane bus
design of the interface to the reader for communication	Internal plug to the connection block
<b>mechanical data</b>	
material	Thermoplastic (Valox 467, fiberglass reinforced)
color	IP Basic 714
tightening torque of the screw for securing the equipment maximum	1.5 N·m
<b>supply voltage, current consumption, power loss</b>	
supply voltage	
• at DC rated value	24 V
• at DC	20 ... 30 V
consumed current at DC at 24 V	
• without connected devices typical	0.13 A
• with connected devices maximum	1 A
<b>ambient conditions</b>	
ambient temperature	
• during operation	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
protection class IP	IP67
shock resistance	According to IEC 61131-2
shock acceleration	300 m/s <sup>2</sup>
vibrational acceleration	100 m/s <sup>2</sup>

Article number	<b>6GT2002-0HD01</b>
product type designation	RF170C communications module
<b>design, dimensions and weights</b>	
width	90 mm
height	130 mm
depth	35 mm
net weight	0.27 kg
fastening method	ET 200pro rack
wire length for RS 422 interface maximum	1 000 m
<b>product features, product functions, product components general</b>	
display version	(see connection block)
product function addressable	No
transponder file handler	
protocol is supported	
• S7 communication	Yes
<b>product functions management, configuration, engineering</b>	
type of parameterization	HSP
type of programming	FB 45, FB 55, ID profile, library with functions, (FC 45/55 with restricted functionality)
type of computer-switched communication	acyclic communication
<b>standards, specifications, approvals</b>	
certificate of suitability	CE, FCC, cULus
MTBF	77 y
<b>accessories</b>	
accessories	Connection block for RF170C

## Overview

**Power supply for ET200pro:**

- 3-phase, 24 V DC/8 A

The SIMATIC ET200pro PS power supply unit with IP67 degree of protection is used as the electronics/encoder supply and load voltage supply of the new SIMATIC ET 200pro distributed I/O system for use close to the machine without a cabinet. With a second connector for looping the input voltage.

**Product highlights**

- 3-phase, 24 V DC/8 A
- Wide-range input, input voltage 340 ... 550 V
- Up to 88% efficiency
- With signaling contact for "24 V OK" and "Overtemperature"
- Status indicator on the device by means of LED (green = "24 V OK")
- Temperature range from -25 °C to +55 °C

## Ordering data

**SIMATIC ET 200pro PS**

Stabilized power supply in distributed I/O system design, permitting the loop-through of energy to further modules; with degree of protection IP67; Input: 3 AC 400-480 V Output: 24 V DC/8 A

**Accessories****Power connector**

For connecting to the distributed I/O system

- For X1 (6 mm<sup>2</sup>)
- For X2 (4 mm<sup>2</sup>)

## Article No.

6ES7148-4PC00-0HA0

3RK1911-2BE30  
3RK1911-2BF10

## Article No.

**National Fire Protection Association compatible**

These devices are only approved for installation in industrial machinery according to the NFPA79 Electrical Standard for Industrial Machinery.

- for X1 SIMATIC ET200pro PS 61 88 201 1003.xx (AWG10)\*
- for X1 SITOP PSU300P 61 88 201 1000.xx / 61 88 201 1002.xx (AWG14)\*
- for X2 SIMATIC ET200pro PS 61 88 202 1010.xx (AWG10)\*  
supplied blanking cap for X2
- for X3 Phoenix-Contact SAC-5P-M12-M12FS  
supplied blanking cap for X3

**Sealing cap**

For 9-pole power sockets

- X2 (1 unit)
- X2 (10 units)

\* <http://www.harting.com/startseite>

3RK1902-0CK00

3RK1902-0CK00  
3RK1902-0CJ00

## Technical specifications

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
<b>Input</b>	
Input	3-phase AC
Rated voltage value $V_{in rated}$	400 ... 480 V
Voltage range AC	340 ... 550 V
• Note	320 ... 340 V for max. 1 min
Wide-range input	Yes
Overvoltage resistance	Implemented internally with varistors
Mains buffering	at $V_{in} = 400 V$
Mains buffering at $I_{out rated, min.}$	15 ms; at $V_{in} = 400 V$
Rated line frequency 1	50 Hz
Rated line frequency 2	60 Hz
Rated line range	45 ... 66 Hz

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
input current	
• at rated input voltage 400 V	0.5 A
Switch-on current limiting (+25 °C), max.	40 A
$I^2t, max.$	3.5 A <sup>2</sup> ·s
Built-in incoming fuse	T 4 A
Protection in the mains power input (IEC 898)	Required: Circuit breaker 3RV2011-1DA10 or 3RV2711-1DD10 (UL 489)
<b>Output</b>	
Output	Controlled, isolated DC voltage
Rated voltage $V_{out DC}$	24 V
• output voltage at output 1 at DC rated value	24 V

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro**Power supplies > 3-phase, DC 24 V (ET200pro PS, IP67)****Technical specifications**

Article number	<b>6ES7148-4PC00-0HA0</b>
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.5 %
Static load balancing, approx.	0.5 %
Residual ripple peak-peak, max.	200 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	250 mV
product function output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
Signaling	max. 30 V, 10 mA; Power-Good (High-Pegel 1L+ for V <sub>out</sub> in range 21.3 ... 29 V); Overtemperature warning at least 30 s before switch-off (high level 1L+ when the max. internal temperature is exceeded)
On/off behavior	Overshoot of V <sub>out</sub> < 2 %
Startup delay, max.	1.5 s
Voltage rise, typ.	40 ms
Rated current value I <sub>out rated</sub>	8 A
Current range	0 ... 8 A
supplied active power typical	192 W
short-term overload current	
• on short-circuiting during the start-up typical	50 A
• at short-circuit during operation typical	50 A
duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
Parallel switching for enhanced performance	No
<b>Efficiency</b>	
Efficiency at V <sub>out rated</sub> , I <sub>out rated</sub> , approx.	88 %
Power loss at V <sub>out rated</sub> , I <sub>out rated</sub> , approx.	25 W
<b>Closed-loop control</b>	
Dynamic mains compensation (V <sub>in rated</sub> ± 15 %), max.	0.5 %
Dynamic load smoothing (I <sub>out</sub> : 50/100/50 %), U <sub>out</sub> ± typ. setting time maximum	1 %
	2 ms
<b>Protection and monitoring</b>	
Output overvoltage protection	< 33 V
Current limitation, typ.	9.4 A
property of the output short-circuit proof	Yes
Short-circuit protection	Electronic shutdown, automatic restart
enduring short circuit current RMS value	
• maximum	10 A
Overload/short-circuit indicator	-

Article number	<b>6ES7148-4PC00-0HA0</b>
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
<b>Safety</b>	
Primary/secondary isolation galvanic isolation	Yes
Protection class	Protective extra low output voltage V <sub>out</sub> according to EN 60950-1 and EN 50178
leakage current	Class I
• maximum	3.5 mA
• typical	0.4 mA
Degree of protection (EN 60529)	IP67, enclosure type 5 indoor
<b>Approvals</b>	
CE mark	Yes
UL/cUL (CSA) approval	UL-Listed (UL 508) according to NFPA compatibility (National Fire Protection Association), see operating instructions
Explosion protection certificate of suitability NEC Class 2	-
FM approval	No
CB approval	-
certificate of suitability EAC approval	Yes
Marine approval	Yes
<b>EMC</b>	
Emitted interference	EN 55022 Class A
Supply harmonics limitation	-
Noise immunity	EN 61000-6-2
<b>environmental conditions</b>	
ambient temperature	
• during operation	-25 ... +55 °C
- Note	with natural convection
• during transport	-40 ... +70 °C
• during storage	-40 ... +70 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>	
Connection technology	screw-type terminals
Connections	
• Supply input	L1, L2, L3, PE: Plug connector HAN Q4/2 (counterpart see "Electrical accessories")
• Output	L+, M: 2 x 1.5 mm <sup>2</sup> each (4-pole cable for +/- with open, labeled ends, 4 x 1.5 mm <sup>2</sup> )
• Auxiliary	Alarm signals: M12 plug-in connector 5-pin
width of the enclosure	310 mm
height of the enclosure	135 mm
depth of the enclosure	90 mm
Weight, approx.	2.8 kg
product feature of the enclosure housing can be lined up	No
Installation	Can be mounted onto ET200pro mounting rail
electrical accessories	Power connector (Input: 3RK1911-2BE30 (6 mm <sup>2</sup> )) (Output: 3RK1911-2BF10 (4 mm <sup>2</sup> ))
MTBF at 40 °C	196 354 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

**Overview****ET 200pro motor starters in I/O system ET 200pro**

SIMATIC ET 200pro is the modular I/O system with high degree of protection IP65/66/67 for local, cabinet-free use. The ET 200pro motor starters with the high degree of protection IP65 are an integral part of ET 200pro.



ET 200pro motor starter: Isolator module, Standard starter and High Feature starter mounted on a wide module rack

**ET 200pro motor starters** (see pages 10/404 and 10/405)

- Only two variants up to 5.5 kW
- All settings can be parameterized by bus
- Comprehensive diagnostic signals
- Support for PROFlenergy
- Overload can be acknowledged by remote reset
- Current unbalance monitoring
- Stall protection
- EMERGENCY START function on overload
- Current value transmission by bus
- Current limit monitoring
- Full support of acyclic services
- Direct-on-line or reversing starters
- Power bus connection can be plugged in using Han Q4/2 plug-in connectors
- Motor feeder with Han Q8/0 connector
- Conductor cross-section up to 6 x 4 mm<sup>2</sup>
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High Feature versions (with 4 DI on-board)
- Electromechanical switching and electronic switching
- Electronic starter for direct activation or with integrated soft starter function
- Supplied with 400 V AC brake contact as an option
- Temperature sensor can be connected (Thermoclick or PTC type A)
- Provision of the motor current in PROFlenergy format to higher-level systems, motor current shutdown in dead times using PROFlenergy

**More information**

Homepage, see [www.siemens.com/ET200pro](http://www.siemens.com/ET200pro)

Industry Mall, see [www.siemens.com/product?ET200pro](http://www.siemens.com/product?ET200pro)

Further components in the ET 200pro distributed I/O system

- Interface modules, Zentralbaugruppen, Peripheriemodule, ET 200pro PS see from page 10/366
- SIMATIC ET 200pro FC-2 frequency converter see page 10/416

**ET 200pro isolator modules** (see page 10/406)

The isolator module with switch disconnecter function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

**Safety applications**

Safety Solution local (see page 10/409)

With the Safety local modules

- Safety local isolator module and
- 400 V disconnecting module with an appropriate connection, safety level PL e (according to ISO 13849-1) can be reached.

Safety Solution PROFIsafe (see page 10/410)

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module with an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can also be reached.

**Functionality**

With the ET 200pro motor starters, any three-phase loads can be protected and switched.

The ET 200pro motor starters are available with mechanical and also electronic contacts.

The ET 200pro electromechanical starters are offered as direct-on-line starters (DSe) and reversing starters (RSe) as **Standard** and **High Feature** versions. There are device versions with or without control for externally fed brakes with 400 V AC.

Compared with the Standard motor starters, the **High Feature, mechanical** motor starter also has:

- Four digital inputs
- Advanced parameterization options

The ET 200pro electronic starters are offered as direct-on-line starters (sDSSSte/sDSte) and reversing starters (sRSSSte/sRSte) in the High Feature version.

Compared with the High Feature mechanical motor starters, the **High Feature, electronic** motor starter also has:

- Soft starting and smooth ramp-down function
- Deactivated soft start function as an electronic starter for applications with a high switching frequency
- Advanced parameterization options

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

### ET 200pro motor starters > General data

As a result of the protection concept with solid-state overload evaluation and the use of SIRIUS switching devices, size S00, additional advantages are realized on the Standard and High Feature motor starters – advantages that soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Configuration is made easier by the fine modular structure with ET 200pro. When using ET 200pro motor starters, the parts list per load feeder is reduced to two main items: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveying systems and in machine-tool building.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are also optimized by the low level of variance (two units up to 5.5 kW).
- With four locally acting inputs available on the High Feature motor starter it is possible to realize autonomous special functions that work independently of the bus and the higher level control system, e.g. as a quick stop on gate valve controls or limit position disconnectors. In parallel with this, the states of these inputs are signaled to the control system.

#### Article No. scheme

Product versions		Article number				
<b>Motor starters</b>		<b>3RK1304 - 5</b> <input type="checkbox"/> S <input type="checkbox"/> 0 - <input type="checkbox"/> A A <input type="checkbox"/>				
Setting range	0.15 ... 2.0 A 1.5 ... 12 A	<b>K</b>				
		<b>L</b>				
Product function	Direct-on-line starters DSe		<b>4</b>	<b>4</b>		Standard
	Reversing starters RSe		<b>4</b>	<b>5</b>		Standard
	Direct-on-line starters DSe		<b>4</b>	<b>2</b>		High Feature
	Reversing starters RSe		<b>4</b>	<b>3</b>		High Feature
	Direct-on-line starters sDStSe/sDStSe		<b>7</b>	<b>2</b>		High Feature
	Reversing starters sDStSe/sDStSe		<b>7</b>	<b>3</b>		High Feature
Inputs/outputs	Without brake output					<b>0</b>
	With brake output					<b>3</b> 400 V AC, with High Feature + 4 inputs
Example		<b>3RK1304 - 5 K S 4 0 - 4 A A 0</b>				

Product versions		Article number				
<b>Modules</b>		<b>3RK1304 - 0 H S 0 0 -</b> <input type="checkbox"/> A A <b>0</b>				
Product function	Isolator modules					<b>6</b>
	Isolator modules					<b>7</b> Safety modules local
	400 V disconnecting module					<b>8</b> Safety modules local/PROFIsafe
Example		<b>3RK1304 - 0 H S 0 0 - 6 A A 0</b>				

#### Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Type	Standard motor starters		High Feature motor starters	
	DSe, RSe		DSe, RSe	sDSSSte, sDSte, sRSSSte, sRSte
<b>Technology designation<sup>1)</sup></b>				
<b>Device functions (firmware features)</b>				
Parameterizable rated operational current		✓		
Integrated short-circuit protection		✓		
Parameterizable current limit values		--	✓ 2 limit values	
Parameterizable response in case of current limit violation		--	✓	
Zero current monitoring		✓		
Parameterizable response in case of zero current violation		✓		
Parameterizable current unbalance limit	%	-- Fixed limit value (30 x I <sub>e</sub> )	✓ 30 ... 60 x I <sub>e</sub>	
Parameterizable response in case of unbalance limit violation		✓		
Motor blocking monitoring		--	✓	
Parameterizable blocking current limit	%	--	✓ 150 ... 1 000 x I <sub>e</sub>	
Parameterizable blocking time limit	s	--	✓ 1 ... 5	
Current value transmission		✓		
Group warning diagnostics		--	✓ Parameterizable	
Group diagnostics		✓ Parameterizable		
<b>EMERGENCY START</b>				
<b>Digital inputs</b>				
• Parameterizable input signal		--	✓ 4 inputs	
• Parameterizable input level		--	✓ Latching/non-latching	
• Parameterizable input signal delay	ms	--	✓ NC/NO contacts	
• Parameterizable input signal extension	ms	--	✓ 10 ... 80	
• Parameterizable input control actions		--	✓ 0 ... 200	
			✓ 12 different actions	
<b>Brake output (400 V AC)</b>				
		✓ Order option		
Parameterizable brake enabling delay	s	✓ -2.5 ... +2.5		
Parameterizable holding time of the brake during stopping	s	✓ 0 ... 25		
Parameterizable start up type		--		✓
Parameterizable ramp-down time		--		✓
Parameterizable starting voltage		--		✓
Parameterizable stopping voltage		--		✓
Local device interface		✓		
Firmware update		✓ By specialists		
<b>Thermal motor model</b>				
		✓		
Parameterizable trip class		-- CLASS 10 fixed	✓ CLASS 5, 10, 15, 20	
Parameterizable response in case of overload of thermal motor model		--	✓ 3 possible states	
Advance warning limit for motor heating	%	--	✓ Parameterizable 0 ... 95	
Advance warning limit time-related trip reserve	s	--	✓ Parameterizable 0 ... 500	
Parameterizable recovery time	min	--	✓ 1 ... 30	
Parameterizable protection against voltage failure		-- Permanently integrated	✓	
<b>Reversing start function</b>				
		✓ Order option		
Parameterizable interlock time for reversing starters		-- 150 ms fixed	✓ 0 ... 60 s	
<b>Integrated logbook functions</b>				
		✓ 3 device logbooks		
<b>Integrated statistics data memory</b>				
		✓		
Parameterizable response in case of CPU/master stop		✓		
<b>PROFenergy profile support</b>				
• Disconnection of the motor current during idle times		✓		
• Measured motor current values		✓		
<b>Device indications</b>				
• Group fault		SF LED (red)		
• Switching state		STATE LED (red, yellow, green)		
• Device status		DEVICE LED (red, yellow, green)		
• Digital inputs		--	IN 1 ... IN 4, LED	

✓ Function available

-- Function not available

- 1) DS .... Direct-on-line starters  
 RS .... Reversing starters  
 DSS .. Direct-on-line soft starters  
 RSS .. Reversing soft starters  
 e ..... Electronic motor protection  
 te ..... Full motor protection (thermal + electronic)  
 s ..... Electronic switching with semiconductor.

## I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro motor starters > General data

### Benefits

ET 200pro motor starters provide the following advantages:

- High flexibility thanks to a modular and compact design
- Little variance among all motor starter versions (two units up to 5.5 kW)
- Extensive parameterization using STEP 7 HW Config
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs for on-site control functions (High Feature)
- Cabinet-free design thanks to high degree of protection IP65

### Application

The SIMATIC ET 200pro motor starters are ideal for the use of several spatially concentrated distributed drive solutions in which several motors, or digital or analog sensors and actuators are addressed from a distributed station. They are perfectly suited for protecting and switching any AC loads.

#### **Application areas**

The SIMATIC ET 200pro motor starters are suitable for numerous sectors of industry, e.g. machinery and plant engineering or conveying applications.

#### ***Use of ET 200pro motor starters in conjunction with IE3/IE4 motors***

##### Note:

For the use of ET 200pro motor starters in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, [see Application Manual](#).



### Technical specifications

More information			
Manual, see <a href="https://support.industry.siemens.com/cs/ww/en/view/22332388">https://support.industry.siemens.com/cs/ww/en/view/22332388</a>		Notes on security: System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation. For more information on the subject of Industrial Security, see <a href="http://www.siemens.com/industrialsecurity">www.siemens.com/industrialsecurity</a> .	
Type		Standard motor starters Mechanically switching without inputs	High Feature motor starters Mechanically switching with inputs Mechanically switching with inputs and soft starter function
Technology designation <sup>1)</sup>		DSe, RSe	DSe, RSe sDSSSte, sDSte, sRSSSte, sRSte
Mechanics and environment			
Motor starters or modules that can be connected to ET 200pro With width of 110 mm		max. 8	
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters	mm	110 x 230 x 150	110 x 230 x 160
Permissible ambient temperature • During operation • During storage	°C °C	-25 ... +55, from +40 with derating -40 ... +70	
Permissible mounting position		Vertical, horizontal	
Vibration resistance acc. to IEC 60068, Part 2-6	g	2	
Shock resistance acc. to IEC 60068, Part 2-27	g/ms	Half-sine 15/11	
Degree of protection		IP65	
Pollution degree		3, IEC 60664 (IEC 61131)	
Electrical specifications			
Power consumption at 24 V DC • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	mA mA	Approx. 40 Approx. 200	
Rated operational current $I_g$ for power bus	A	25	
Rated operational voltage $U_g$ • Approval according to EN 60947-1, Appendix N • Approval according to CSA and UL	V AC V AC V AC	400 (50/60 Hz) Up to 400 (50/60 Hz) Up to 600 (50/60 Hz)	
Approval • DIN VDE 0106, Part 101 • CSA and UL approval	V V	Up to 400 Up to 600	
Conductor cross-sections • Incoming power supply	mm <sup>2</sup>	Max. 6 x 4	
Touch protection		Finger-safe	
Rated impulse withstand voltage $U_{imp}$	kV	6	
Rated insulation voltage $U_i$	V	400	
Rated operational current $I_g$ for starters • AC-1 / 2 / 3 at 40 °C - At 400 V - At 500 V • AC-4 at 40 °C - At 400 V	A A A	0.15 ... 2.0/1.5 ... 12.0 0.15 ... 2.0/1.5 ... 9.0 0.15 ... 2.0/1.5 ... 4.0	
Rated short-circuit breaking capacity	kA	100 at 400 V	
Type of coordination acc. to IEC 60947-4-1		1	
Power of three-phase motors at 400 V	kW	Max. 5.5	
Utilization categories		AC-1, AC-2, AC-3, AC-4	
Protective separation between main and auxiliary circuits	V	400, acc. to EN 60947-1, Appendix N	
Endurance of contactor • Mechanical • Electrical	Operating cycles Operating cycles	30 million Up to 10 million; depending on the current loading (see manual)	
Permissible switching frequency		Depending on the current loading, motor starting time, and relative ON period (see manual)	
Operating times at 0.85 ... 1.1 x $U_g$ • Closing delay • Opening delay	ms ms	11 ... 50 5 ... 45	

<sup>1)</sup> DS ... Direct-on-line starters  
RS ... Reversing starters  
DSS .. Direct-on-line soft starters  
RSS .. Reversing soft starters  
e ..... Electronic motor protection  
te ..... Full motor protection (thermal + electronic)  
s ..... Electronic switching with semiconductor.

<sup>2)</sup> If the soft starter control function is deactivated, the permissible rated operational current is reduced to 9 A up to CLASS 10.  
<sup>3)</sup> With parameterization as electronic starter max. 4 kW.  
<sup>4)</sup> 8-hour operation.

## I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro motor starters > Standard motor starters **IE3/IE4 ready**

### Overview

The functionality, device functions, and technical specifications of the Standard motor starter are described in "ET 200pro motor starters, General data" (see page 10/399 onwards).

### Selection and ordering data

Version	Article No.
---------	-------------

#### Standard motor starters, mechanical Motor protection: thermal model



DSe Standard

##### DSe direct-on-line starters<sup>1)</sup>

- Without brake output
- With brake output 400 V AC

**3RK1304-5□S40-4AA0**  
**3RK1304-5□S40-4AA3**

##### RSe reversing starters<sup>1)</sup>

- Without brake output
- With brake output 400 V AC

**3RK1304-5□S40-5AA0**  
**3RK1304-5□S40-5AA3**

Setting range  
Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

**K**  
**L**

<sup>1)</sup> Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 10/415).

**Overview**

The functionality, device functions, and technical specifications of the High Feature motor starter are described in "ET 200pro motor starters, General data" (see page 10/399 onwards).

The High Feature motor starter differs from the Standard motor starter in having more parameters and four integrated, freely-parameterizable digital inputs.

**Selection and ordering data**

Version	Article No.
---------	-------------

**High Feature motor starters, mechanical**  
**Motor protection: thermal model**


RSe High Feature

**DSe direct-on-line starters<sup>1)</sup>**

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

**3RK1304-5□S40-2AA0**  
**3RK1304-5□S40-2AA3**
**RSe reversing starters<sup>1)</sup>**

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

**3RK1304-5□S40-3AA0**  
**3RK1304-5□S40-3AA3**

 Setting range  
 Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

 K  
 L

**High Feature motor starters<sup>2)</sup>, electronic**  
**Full motor protection, comprising thermal motor protection and**  
**thermistor motor protection**


sRSSt High Feature

**Direct-on-line starters sDSSt/sDSt<sup>1)2)</sup>**

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

**3RK1304-5□S70-2AA0**  
**3RK1304-5□S70-2AA3**
**Reversing starters sRSSt/sRSt<sup>1)2)</sup>**

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

**3RK1304-5□S70-3AA0**  
**3RK1304-5□S70-3AA3**

 Setting range  
 Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

 K  
 L

<sup>1)</sup> Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 10/415).

<sup>2)</sup> The solid-state motor starters can be used not only as solid-state motor starters with a high level of switching frequency but also as fully fledged soft starters for soft starting and stopping. The changeover from motor starter to soft starter takes place through reparameterization in HW Config. Depending on the setting, this results in the following current ranges:

- Parameterization as solid-state motor starter: 0.15 to 2 A and 1.5 to 9 A (4 kW)
- Parameterization as soft starter: 0.15 to 2 A and 1.5 to 12 A (5.5 kW).

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

ET 200pro motor starters > ET 200pro isolator modules **IE3/IE4 ready**

### Overview

The isolator module with integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters) and switch disconnecter function is used to safely disconnect the 400 V operating voltage during repair work in the plant.

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

The following properties apply to the isolator module:

- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free design thanks to high degree of protection IP65

The isolator module is available in addition in a safety version (see "Safety local isolator module" on page 10/407).

### Technical specifications

Type	Isolator modules	
<b>General data</b>		
<b>Mounting dimensions (W x H x D)</b>		
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170
<b>Permissible ambient temperature</b>		
• During operation	°C	-25 ... +55
• During storage	°C	-40 ... +70
<b>Permissible mounting position</b>		
		Any
<b>Vibration resistance acc. to IEC 60068 Part 2-6</b>		
	g	2
<b>Shock resistance acc. to IEC 60068 Part 2-27</b>		
	g/ms	Half-sine 15/11
<b>Power consumption</b>		
• From auxiliary circuit L+/M (U1)	mA	Approx. 20
• From auxiliary circuit A1/A2 (U2)		--
<b>Rated operational current <math>I_e</math> for power bus</b>		
	A	25
<b>Rated operational voltage <math>U_e</math></b>		
	V	400
<b>Approvals according to</b>		
• DIN VDE 0106, Part 101	V	Up to 500
• CSA and UL	V	Up to 600
<b>Conductor cross-sections</b>		
• Incoming power supply	mm <sup>2</sup>	Max. 6 x 4

Type	Isolator modules	
<b>Degree of protection</b>		
		IP65
<b>Touch protection</b>		
		Finger-safe
<b>Pollution degree</b>		
		3, IEC 60664 (IEC 61131)
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		
	kV	6
<b>Rated insulation voltage <math>U_i</math></b>		
	V	400
<b>Rated operational current <math>I_e</math> for starters</b>		
• AC-1 / 2 / 3 at 40 °C		
- At 400 V	A	25
- At 500 V	A	25
<b>Rated short-circuit breaking capacity</b>		
	kA	50 at 400 V
<b>Type of coordination acc. to IEC 60947-4-1</b>		
		2
<b>Protective separation between main and auxiliary circuits</b>		
	V	400, according to DIN VDE 0106, Part 101
<b>Device functions</b>		
• Group diagnostics		Yes, parameterizable
<b>Device indications</b>		
• Group fault		SF LED (red)

### Selection and ordering data

Version

Article No.

#### ET 200pro isolator modules, mechanical



3RK1304-0HS00-6AA0

#### Isolator modules<sup>1)</sup>

Rated operational current 25 A

3RK1304-0HS00-6AA0

<sup>1)</sup> Only functions when used together with the related 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see page 10/415).

**Overview****Safety Solution local**

With the Safety local modules

- Safety local isolator module and
  - 400 V disconnecting module
- with an appropriate connection, safety level PL e (according to ISO 13849-1) can be reached.



ET 200pro motor starter (Safety Solution local): Safety local isolator module, disconnecting module, Standard starter and High Feature starter mounted on a wide module rack

**Safety local isolator module**

The Safety local isolator module is a repair switch with integrated safety evaluation functions that can be parameterized using DIP switches.

It is used for

- Connection of a 1- or 2-channel EMERGENCY STOP circuit up to PL e (protective door or EMERGENCY STOP pushbuttons) and parameterizable start behavior
- For controlling the 400 V disconnecting module by means of a safety rail signal

**400 V disconnecting module**

The 400 V disconnecting module enables the safe disconnection of an operational voltage of 400 V up to PL e. For operation in a Safety Solution local application, it functions only in combination with the Safety local isolator module.

For operation in a Safety PROFIsafe application it functions only in combination with the F-Switch.

**Functionality**Safety local isolator module

The Safety local isolator module features the same functions as a standard isolator module with an additional local safety function.

The Safety local isolator module contains a 3TK2841 module and is equipped with M12 terminals for the connection of external safety components.

Terminals 1 and 2 can be used to connect either 1-channel or 2-channel EMERGENCY STOP circuits or protective door circuits (IN 1, IN 2).

For monitored starts, an external START switch can be connected to terminal 3.

The required safety functions can be set using two slide switches located under the left M12 opening.

In the event of an EMERGENCY STOP, the Safety local isolator module trips the downstream 400 V disconnecting module. This safely separates the 400 V circuit up to PL e.

In combination with the 400 V disconnecting module, the Safety local isolator module can be used for safety applications up to PL e.

400 V disconnecting module

The 400 V disconnecting module can be used together with the Safety local isolator module for local safety applications and together with the F-Switch for PROFIsafe safety applications.

It contains two contactors connected in series for safety-related disconnection of the main circuit.

The auxiliary circuit supply of the device is over a safety power rail in the backplane bus module.

The 400 V disconnecting module can be used in conjunction with the Safety local isolator module or with the F-Switch for safety applications up to PL e.

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro Safety motor starters Solutions local/PROFIsafe &gt; Safety modules local

**Technical specifications**

Type		Safety local isolator module	400 V disconnecting module
<b>General data</b>			
<b>Mounting dimensions (W x H x D)</b>			
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170	110 x 230 x 150
<b>Permissible ambient temperature</b>			
• During operation	°C	-25 ... +55	
• During storage	°C	-40 ... +70	
<b>Permissible mounting position</b>		Any	
<b>Vibration resistance acc. to IEC 60068, Part 2-6</b>		2 g	
<b>Shock resistance acc. to IEC 60068, Part 2-27</b>		Half-sine 15 g/11 ms	
<b>Power consumption</b>			
• From auxiliary circuit L+/M (U1)	mA	Approx. 20	
• From auxiliary circuit A1/A2 (U2)		--	
<b>Rated operational current <math>I_e</math> for power bus</b>	A	25	
<b>Rated operational voltage <math>U_e</math></b>	V	400 (50/60 Hz)	
<b>Approval DIN VDE 0106, Part 101</b>	V	Up to 500	
<b>CSA and UL approval</b>	V	Up to 600	
<b>Conductor cross-sections</b>			
Incoming power supply	mm <sup>2</sup>	Max. 6 x 4	
<b>Degree of protection</b>		IP65	
<b>Touch protection</b>		Finger-safe	
<b>Pollution degree</b>		3, IEC 60664 (IEC 61131)	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6	
<b>Rated insulation voltage <math>U_i</math></b>	V	400	
<b>Rated operational current <math>I_e</math> for starters</b>			
• AC-1 / 2 / 3 at 40 °C			
- At 400 V	A	16	25
- At 500 V	A	16	25
<b>Rated short-circuit breaking capacity</b>	kA	50 at 400 V	
<b>Type of coordination acc. to IEC 60947-4-1</b>		2	
<b>Protective separation between main and auxiliary circuits</b>	V	400, according to DIN VDE 0106, Part 101	
<b>Operating times at 0.85 ... 1.1 x <math>U_s</math></b>			
• Closing delay	ms	--	25 ... 100
• Opening delay	ms	--	7 ... 10
<b>Device functions</b>			
• Group diagnostics		Yes, parameterizable	
<b>Device indications</b>			
• Group fault		SF LED (red)	

### Selection and ordering data

Version	Article No.
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#### Safety modules local



3RK1304-0HS00-7AA0

#### Safety local isolator module<sup>1)2)</sup>

Rated operational current 16 A

**3RK1304-0HS00-7AA0**

3RK1304-0HS00-8AA0

#### 400 V disconnecting module<sup>3)4)</sup>

Rated operational current 25 A

**3RK1304-0HS00-8AA0**

- 1) The Safety local isolator module only functions when used together with the 400 V disconnecting module.
- 2) Only in combination with the special backplane bus module for the Safety Local isolator module (see "Accessories for ET 200pro motor starters", page 10/415).
- 3) The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.
- 4) The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 10/415).

**I/O systems**

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

ET 200pro Safety motor starters Solutions local/PROFIsafe > Safety modules PROFIsafe **IE3/IE4 ready**

**Overview****Safety Solution PROFIsafe**

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module

With an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can be reached.

**F-Switch PROFIsafe**

Fail-safe digital inputs/outputs in degrees of protection IP65 to IP67 for near-machine, cabinet-free use.

Fail-safe digital inputs

- For the fail-safe reading in of sensor information (1-/2-channel)
- Including integrated discrepancy evaluation for 2V2 signals
- Internal sensor supplies (incl. testing) available

Fail-safe digital outputs

- Three fail-safe switching to PP potential outputs for safe switching of the backplane busbars

The F-Switch is certified up to SIL 3/PL e and has detailed diagnostics.

It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

Note:

Safety characteristics, see <https://support.industry.siemens.com/cs/ww/en/view/109739348>

Functionality



The PROFIsafe F-Switch is a fail-safe solid-state module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane busbars. In combination with the 400 V disconnecting module, fail-safe disconnection of ET 200pro motor starters is possible in PROFIsafe applications up to SIL 3/PL e.

**400 V disconnecting module**

See "Safety modules local", Overview, page 10/407 and Technical specifications, page 10/408.

10

**Selection and ordering data**

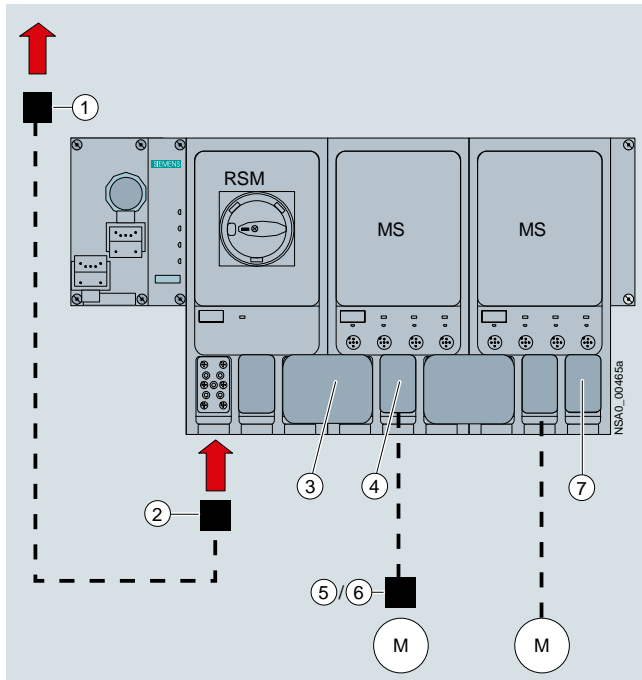
Version	Article No.
<b>Safety modules PROFIsafe</b>	
 <b>400 V disconnecting modules<sup>1)2)</sup></b> Rated operational current 25 A 3RK1304-0HS00-8AA0	<b>3RK1304-0HS00-8AA0</b>
 <b>F-Switch PROFIsafe</b> 24 V DC, including bus module <u>Note:</u> Connection module must be ordered separately 6ES7148-1FS00-0AB0	<b>6ES7148-4FS00-0AB0</b>
<b>Connection modules for F-Switch</b> 24 V DC 6ES7194-4DA00-0AA0	<b>6ES7194-4DA00-0AA0</b>

<sup>1)</sup> The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.

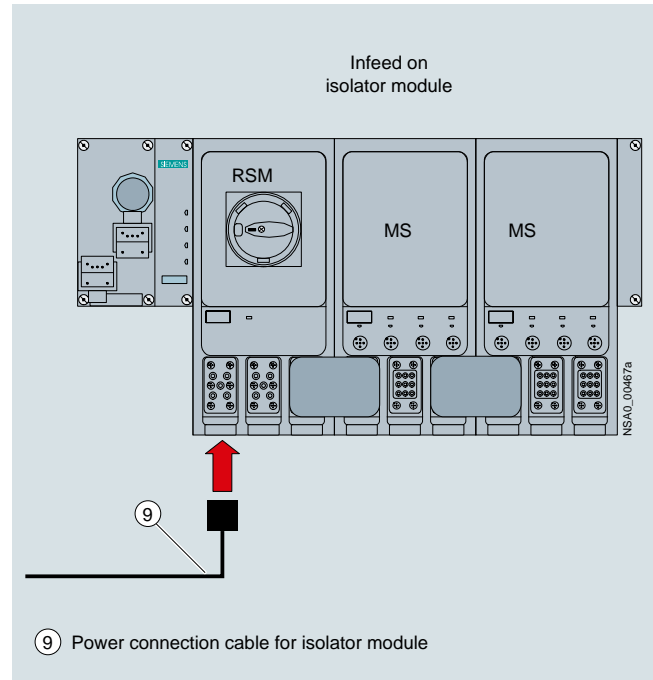
<sup>2)</sup> The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 10/415).



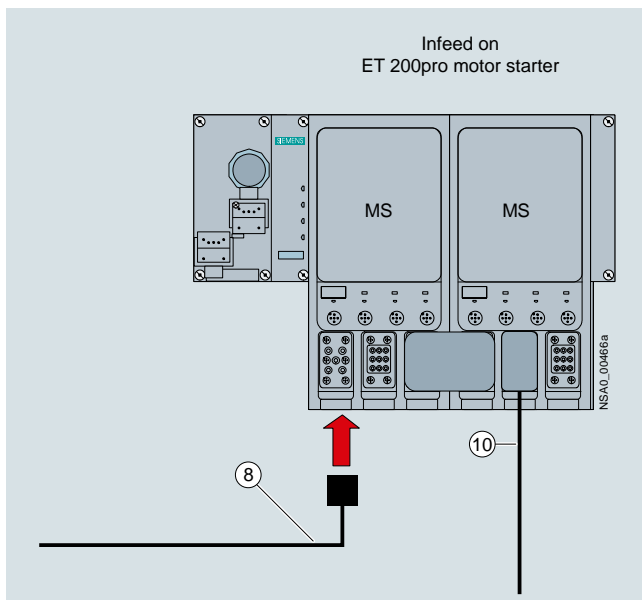
#### Overview



Basic design of an ET 200pro version with (from the left) connection module for IM, interface module for communication (IM), RSM isolator module, two ET 200pro motor starters (MS), and connections for energy



Infeed on the RSM isolator module



Infeed on the ET 200pro motor starter

#### Legend:

- ① Power feeder plug (see page 10/413)
- ② Power connection plug (see page 10/413)
- ③ Power jumper plug (see page 10/413)
- ④ Motor connection plug (see page 10/413)
- ⑤ Motor plug (see page 10/413)
- ⑥ Motor plug with EMC suppressor circuit (see page 10/413)
- ⑦ Power loop-through plug (see page 10/413)
- ⑧ Power connection cable (see page 10/413)
- ⑨ Power connection cable for isolator module (see page 10/413)
- ⑩ Motor cable (see page 10/414)

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

### Accessories for ET 200pro motor starters

#### Power bus

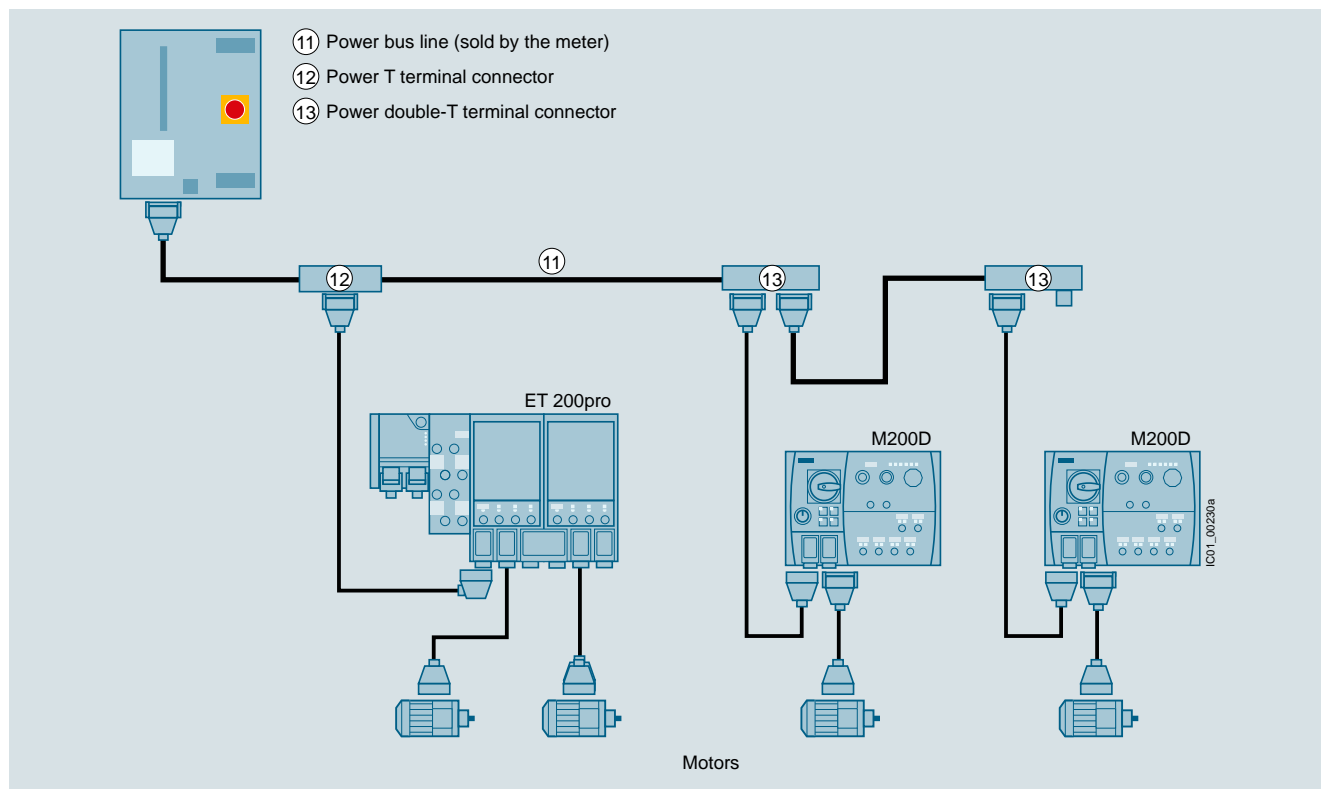
The power supply to the field devices (ET 200pro motor starters, M200D motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

#### Feeders

From the terminal connectors, spur lines with Han Q4/2 plugs lead to the field devices, from which the motors are supplied with power via motor connection cables.

#### Interruption-free thanks to power terminal connectors

In finger-safe connection technology the power T terminal connectors and power double-T terminal connectors connect the components of a feeder to the power bus. They ensure interruption-free operation, i.e. the power bus is not interrupted when the components are plugged in.



Power supply to the motors via the power bus with power T and double-T terminal connectors linked by power bus cables, spur lines to the field devices (motor starters), and power loop-through connections to the motors via motor connection cables

#### Motor control via PROFIBUS

The interface modules (IM) for PROFIBUS can be combined with three different connection modules for connecting PROFIBUS DP and the power supply:

- Direct connection with cable bushings
- ECOFAST connection with hybrid fieldbus cables (with two copper cores for data transmission with PROFIBUS DP, and four copper cores for the power supply), and ECOFAST connectors (HanBrid)<sup>1)</sup>
- M12, 7/8" connection
  - with M12 connecting cable and M12 plugs for data transmission with PROFIBUS DP
  - with 7/8" connecting cable and 7/8" plugs for the power supply<sup>2)</sup>

For the connection modules with the associated accessories, see "Accessories ET 200pro interface modules", page 10/367.

#### Motor control via PROFINET

For the connection modules with the associated accessories, see "Accessories for ET 200pro interface modules", page 10/371 onwards.

<sup>1)</sup> Hybrid fieldbus connections with HanBrid sockets designed as cabinet bushings transmit data and energy from the control cabinet (IP20) to the field (IP65). They are the interface for jointly routing PROFIBUS DP and the auxiliary voltages into the hybrid fieldbus cable (see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10314206?tree=CatalogTree>).

<sup>2)</sup> On the control cabinet bushings with two M12 sockets for the PROFIBUS M12 connecting cables (see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10314206?tree=CatalogTree>), the 24 V supply of the motor starters is implemented via separate 7/8" connecting cables.

### Selection and ordering data



Version	Article No.
<b>Incoming power supply</b>	
<p>① <b>Power feeder plugs</b> Connector set for incoming power supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for HAN Q4/2, incl. bushing</p> <ul style="list-style-type: none"> <li>• 5 male contacts, 2.5 mm<sup>2</sup></li> <li>• 5 male contacts, 4 mm<sup>2</sup></li> <li>• 5 male contacts, 6 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BS60</b> <b>3RK1911-2BS20</b> <b>3RK1911-2BS40</b></p>
<p>② <b>Power connection plugs</b> Connector set for incoming power supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, female insert for HAN Q4/2, including bushing</p> <ul style="list-style-type: none"> <li>• 5 female contacts, 2.5 mm<sup>2</sup></li> <li>• 5 female contacts, 4 mm<sup>2</sup></li> <li>• 5 female contacts, 6 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BE50</b> <b>3RK1911-2BE10</b> <b>3RK1911-2BE30</b></p>
<p>⑧ <b>Power connection cables, assembled at one end</b> Power connection cable for ET 200pro motor starters, open at one end, for HAN Q4/2, angular, 4 x 4 mm<sup>2</sup></p> <ul style="list-style-type: none"> <li>• Length 1.5 m</li> <li>• Length 5.0 m</li> </ul>	<p><b>3RK1911-0DB13</b> <b>3RK1911-0DB33</b></p>
<p>⑨ <b>Power connection cables for isolator module, assembled at one end</b> Power connection cable for ET 200pro isolator modules, open at one end, for HAN Q4/2, angular, insert turned at isolator module end, 4 x 4 mm<sup>2</sup></p> <ul style="list-style-type: none"> <li>• Length 1.5 m</li> <li>• Length 5.0 m</li> </ul>	<p><b>3RK1911-0DF13</b> <b>3RK1911-0DF33</b></p>
<b>Power loop-through on the field device</b>	
<p>③ <b>Power jumper plugs</b></p>	<p><b>3RK1922-2BQ00</b></p>
<p>⑦ <b>Power loop-through plugs</b> Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q4/2, including bushing</p> <ul style="list-style-type: none"> <li>• 4 male contacts, 2.5 mm<sup>2</sup></li> <li>• 4 male contacts, 4 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BF50</b> <b>3RK1911-2BF10</b></p>
<b>Motor cables</b>	
<p>④ <b>Motor connection plugs</b> Connector set for motor cable for connection to ET 200pro motor starters, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q8/0, incl. bushing</p> <ul style="list-style-type: none"> <li>• 8 male contacts, 1.5 mm<sup>2</sup></li> <li>• 6 male contacts, 2.5 mm<sup>2</sup></li> </ul>	<p><b>3RK1902-0CE00</b> <b>3RK1902-0CC00</b></p>
<p>⑤ <b>Motor plugs</b> Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e, incl. star jumper, including bushing</p> <ul style="list-style-type: none"> <li>• 7 female contacts, 1.5 mm<sup>2</sup></li> <li>• 7 female contacts, 2.5 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BM21</b> <b>3RK1911-2BM22</b></p>
<p>⑥ <b>Motor plugs with EMC suppressor circuit</b> Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e with EMC suppressor circuit, including star jumper, including bushing</p> <ul style="list-style-type: none"> <li>• 7 female contacts, 1.5 mm<sup>2</sup></li> <li>• 7 female contacts, 2.5 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BL21</b> <b>3RK1911-2BL22</b></p>





**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

**Accessories for ET 200pro motor starters**

Version	Article No.
<b>Motor cables (continued)</b>	
<p>⑩ <b>Motor cables, assembled at one end</b> Open at one end, HAN Q8, angular, length 5 m</p> <ul style="list-style-type: none"> <li>• For motor without brake, for ET 200pro, 4 x 1.5 mm<sup>2</sup></li> <li>• For motor with brake for ET 200pro, 6 x 1.5 mm<sup>2</sup></li> <li>• For motor without brake, with thermistor, for ET 200pro, 6 x 1.5 mm<sup>2</sup></li> <li>• For motor with brake and thermistor for ET 200pro, 8 x 1.5 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-0EB31</b> <b>3RK1911-0ED31</b> <b>3RK1911-0EF31</b> <b>3RK1911-0EG31</b></p>
<b>Power bus</b>	
<p>⑫ <b>Power T terminal connectors</b> For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments</p> <ul style="list-style-type: none"> <li>• 2.5 mm<sup>2</sup> / 4 mm<sup>2</sup></li> <li>• 4 mm<sup>2</sup> / 6 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BF01</b> <b>3RK1911-2BF02</b></p>
<p>⑬ <b>Power double-T terminal connectors</b> For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments, connection of two motor starters possible</p> <ul style="list-style-type: none"> <li>• 4 mm<sup>2</sup> / 6 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BG02</b></p>
<p><b>Sealing set (comprising 2 seals)</b> For power T/power double-T terminal connectors</p> <ul style="list-style-type: none"> <li>• For power cables with Ø 10 ... 13 mm</li> <li>• For power cables with Ø 13 ... 16 mm</li> <li>• For power cables with Ø 16 ... 19 mm</li> <li>• For power cables with Ø 19 ... 22 mm</li> <li>• Blanking plugs</li> </ul>	<p><b>3RK1911-5BA00</b> <b>3RK1911-5BA10</b> <b>3RK1911-5BA20</b> <b>3RK1911-5BA30</b> <b>3RK1911-5BA50</b></p>
<b>Further accessories for power connections</b>	
<p> 3RK1902-0CW00</p> <p><b>Crimping tool</b> for pins/sockets, 4 mm<sup>2</sup> and 6 mm<sup>2</sup></p>	<p><b>3RK1902-0CW00</b></p>
<p> 3RK1902-0CK00</p> <p><b>Dismantling tools</b></p> <ul style="list-style-type: none"> <li>• For male and female contacts for 9-pole HAN Q4/2 inserts</li> <li>• For male and female contacts for 9-pole HAN Q8 inserts</li> </ul>	<p><b>3RK1902-0AB00</b> <b>3RK1902-0AJ00</b></p>
<p><b>Sealing caps</b> For 9-pole power socket connectors</p> <ul style="list-style-type: none"> <li>• 1 unit per pack</li> <li>• 10 units per pack</li> </ul>	<p><b>3RK1902-0CK00</b> <b>3RK1902-0CJ00</b></p>

Version	Article No.
<b>Further accessories</b>	
<b>Module racks, wide<sup>1)</sup></b> <ul style="list-style-type: none"> <li>Length 500 mm</li> <li>Length 1 000 mm</li> <li>Length 2 000 mm</li> </ul>	<b>6ES7194-4GB00-0AA0</b> <b>6ES7194-4GB60-0AA0</b> <b>6ES7194-4GB20-0AA0</b>
<b>Module racks, wide, compact<sup>1)</sup></b> <ul style="list-style-type: none"> <li>Length 500 mm</li> <li>Length 1 000 mm</li> <li>Length 2 000 mm</li> </ul>	<b>6ES7194-4GD00-0AA0</b> <b>6ES7194-4GD10-0AA0</b> <b>6ES7194-4GD20-0AA0</b>
<b>Backplane bus modules 110 mm<sup>2)</sup></b>	<b>3RK1922-2BA00</b>
<b>Backplane bus module</b> For Safety local isolator modules	<b>3RK1922-2BA01</b>
<b>Handheld devices</b> For ET 200pro motor starters (or for ET 200S High Feature and M200D motor starters) for local operation  <b>Notes:</b> <ul style="list-style-type: none"> <li>The motor-starter-specific serial interface cables must be ordered separately.</li> <li>The RS 232 interface cable 3RK1922-2BP00 is used for the MS ET 200pro.</li> </ul>	<b>3RK1922-3BA00</b>
 3RK1922-3BA00	
<b>RS 232 interface cable</b> Serial data connection between ET 200pro (or M200D) motor starters and the RS 232 interface of a PC/PG/laptop (with the Motor Starter ES software) or the handheld device 3RK1922-3BA00	<b>3RK1922-2BP00</b>
<b>USB interface cable, 2.5 m</b> Serial data connection between ET 200pro (or M200D) motor starters and the USB interface of a PC/PG/laptop (with the Motor Starter ES software)	<b>6SL3555-0PA00-2AA0</b>
<b>M12 sealing caps</b> For sealing unused M12 input or output sockets (one set contains ten sealing caps)	<b>3RK1901-1KA00</b>
 3RK1901-1KA00	
<b>Motor suppression module</b> RC element for installation in motor terminal box <ul style="list-style-type: none"> <li>Type of construction square</li> </ul>	<b>3RK1911-6EA00</b>
 3RK1911-6EA00	
<ul style="list-style-type: none"> <li>Type of construction round</li> </ul>	<b>3RK1911-6EB00</b>
 3RK1911-6EB00	

<sup>1)</sup> The wide module rack can accommodate all ET 200pro motor starters and any optional modules (isolator module, Safety local isolator module and 400 V disconnecting module).

<sup>2)</sup> The backplane bus module is a prerequisite for operation of the ET 200pro motor starter and the optional module.

**Notes:**

- For motor control with PROFIBUS, [see page 10/367](#)
- For motor control with PROFINET, [see page 10/371](#)
- For Manual "SIMATIC ET 200pro Motor Starters", [see https://support.industry.siemens.com/cs/ww/en/view/22332388](https://support.industry.siemens.com/cs/ww/en/view/22332388)
- For more connection technology products, [see https://support.industry.siemens.com/cs/ww/en/view/65355810](https://support.industry.siemens.com/cs/ww/en/view/65355810)

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

### SIMATIC ET 200pro FC-2 frequency converter

#### Overview



SIMATIC ET 200pro FC-2 frequency converter

The SIMATIC ET 200pro FC-2 frequency converter has the design of a SIMATIC ET 200pro module. It supplements the SIMATIC ET 200pro system range with distributed, speed-controlled drives. It is suitable for the open-loop and closed-loop control of asynchronous (induction) motors in a wide range of industrial applications. It is predestined for conveyor technology applications using drives networked via PROFIBUS and PROFINET, in particular in distributed designs without control cabinet with high degree of protection (IP65), when combining several drives. The modular, service-friendly concept is ideally suited to manufacturing processes with high plant standstill costs.

#### Reasons for using distributed drive systems:

- Modular drive solutions – therefore standardized mechatronic elements that can be individually tested
- A control cabinet is not required, resulting in a smaller space requirement and lower cooling requirements
- Long motor cables between converter and motor are not required
  - Less power losses
  - Reduced noise radiation
  - Reduced costs for shielded cables
  - No additional filters
- Distributed configurations offer considerable benefits for conveyor systems with their extensive coverage (e.g. in the automotive and logistics industries)

#### Siemens family of distributed drives

Siemens offers an innovative portfolio of frequency converters to optimally implement distributed drive solutions. The strengths of the individual members of the drive family permit simple adaptation to the widest range of application demands:

- Identical connection systems
- Standard commissioning and engineering tools for the family of distributed drives:
  - SINAMICS G110M frequency converters
  - SINAMICS G110D frequency converters
  - SINAMICS G115D frequency converters
  - SINAMICS G120D frequency converters
  - SIMATIC ET 200pro FC-2 frequency converters
  - SIRIUS M200D motor starters

#### Safety Integrated

The distributed SIMATIC ET 200pro FC-2 frequency converters are already equipped with the integrated STO (Safe Torque Off) safety function, certified in accordance with IEC 61508 SIL 2 as well as EN ISO 13849-1 PL d and Category 3. It can be activated locally via the F-RSM or by means of PROFIsafe.

#### STARTER commissioning tool

The STARTER commissioning tool (V4.4 and higher) plus the corresponding SINAMICS Support Package (SSP) supports the commissioning and maintenance of SIMATIC ET 200pro FC-2 frequency converters.

The operator guidance combined with comprehensive, user-friendly functions for the relevant drive solution allow you to commission the device quickly and easily.

#### Engineering Framework STEP 7 Classic (V5.5 and higher)

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in STEP7 Classic.

#### Engineering Framework TIA Portal (as from V13 SP1)

TIA Portal is a powerful engineering framework providing full access to the whole digitized automation.

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in TIA Portal.

Ordering data	Article No.	Ordering data	Article No.
<b>SIMATIC ET 200pro FC-2 frequency converter</b> with integrated safety function STO (Safe Torque Off)	6SL3514-1KE13-5AE0	<b>STARTER commissioning tool</b> on DVD-ROM	6SL3072-0AA00-0AG0
<b>Backplane bus module</b> for mounting the frequency converter (absolutely essential for operation of the converter)	6SL3260-2TA00-0AA0	<b>PC Connection Kit 2</b> Mini USB interface cable for communication with a PC, 3 m (9.84 ft) long	6SL3255-0AA00-2CA0
<b>Accessories</b>		<b>Connecting cable pre-assembled at one end</b> Power supply cable, open at one end, for HAN Q4/2, angled, 4 × 4 mm <sup>2</sup>	
<b>IOP-2 Handheld</b> For use with SINAMICS G120 SINAMICS G120C SINAMICS G120P SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2 Included in the scope of delivery:	6SL3255-0AA00-4HA1	<ul style="list-style-type: none"> <li>• 1.5 m (4.92 ft) long</li> <li>• 5 m (16.4 ft) long</li> </ul>	<b>3RK1911-0DB13</b>  <b>3RK1911-0DB33</b>
<ul style="list-style-type: none"> <li>• IOP-2</li> <li>• Handheld housing</li> <li>• Rechargeable batteries (4 × AA)</li> <li>• Charging unit (international)</li> <li>• RS232 connecting cable 3 m (9.84 ft) long, can be used in combination with SINAMICS G120, SINAMICS G120C, SINAMICS G120P</li> <li>• USB cable 1 m (3.28 ft) long</li> </ul>		<b>Connector set for the power supply</b> HAN Q4/2	
<b>RS232 connecting cable</b> 2.5 m (8.20 ft) long, with optical interface for connecting the IOP-2 Handheld to SINAMICS G110D, SINAMICS G120D, SINAMICS G110M, SIMATIC ET 200pro FC-2	3RK1922-2BP00	<ul style="list-style-type: none"> <li>• 2.5 mm<sup>2</sup></li> <li>• 4 mm<sup>2</sup></li> <li>• 6 mm<sup>2</sup></li> </ul>	<b>3RK1911-2BE50</b> <b>3RK1911-2BE10</b> <b>3RK1911-2BE30</b>
<b>Memory cards</b>		<b>Motor cables pre-assembled at one end</b> <b>For motors with brake and temperature sensor with HAN Q8 plug, shielded</b>	(HTG: supplied by Harting) (ZKT: supplied by KnorrTec)
<b>SINAMICS SD card 512 MB</b>	6SL3054-4AG00-2AA0	Cross-section	4 × 1.5 mm <sup>2</sup> 2 × (2 × 0.75 mm <sup>2</sup> )
Optional firmware memory cards		<ul style="list-style-type: none"> <li>• 1.5 m (4.92 ft) long</li> <li>• 3 m (9.84 ft) long</li> <li>• 5 m (16.4 ft) long</li> <li>• 10 m (32.8 ft) long</li> </ul>	<b>HTG: 61 88 201 0288</b> <b>ZKT: 70020501000150</b> <b>HTG: 61 88 201 0289</b> <b>ZKT: 70020501000300</b> <b>HTG: 61 88 201 0290</b> <b>ZKT: 70020501000500</b> <b>HTG: 61 88 201 0299</b> <b>ZKT: 70020501001000</b>
<b>SINAMICS SD card 512 MB + firmware V4.7 SP13</b> (Multicard V4.7 SP13)	6SL3054-7TG00-2BA0	<b>Connector set for motor cable</b> HAN Q8, shielded	<b>HTG: 61 83 401 0131</b> <b>ZKT: 10032001</b>
		<b>Power jumper plugs</b>	<b>3RK1922-2BQ00</b>

## Technical specifications

Distributed frequency converter	SIMATIC ET 200pro FC-2
<b>Selection features</b>	
<b>Integrated safety functions acc. to IEC 61508 SIL 2 and EN ISO 13849-1 PL d and Category 3</b>	<ul style="list-style-type: none"> <li>• Safe Torque Off (STO)</li> <li>• Control of the integrated safety function via the Safety Local isolator module F-RSM or via F-Switch PROFIsafe</li> </ul>
<b>Electrical data</b>	
<b>Line voltage</b>	380 ... 480 V 3 AC ±10 %
<b>Power</b>	
<ul style="list-style-type: none"> <li>• With an ambient temperature of 0 ... 55 °C</li> <li>• With an ambient temperature of 0 ... 45 °C</li> </ul>	1.1 kW 1.5 kW
<b>Rated input current/output current</b>	
<ul style="list-style-type: none"> <li>• With an ambient temperature of 0 ... 55 °C</li> <li>• With an ambient temperature of 0 ... 45 °C</li> </ul>	2 A/3.5 A 2.5 A/3.9 A
<b>Line frequency</b>	47 ... 63 Hz
<b>Overload capability</b>	<ul style="list-style-type: none"> <li>• Overload current 1.5 x rated output current (i.e. 150 % overload) for 60 s, cycle time 300 s</li> <li>• Overload current 2 x rated output current (i.e. 200 % overload) for 3 s, cycle time 300 s</li> </ul>

**I/O systems**

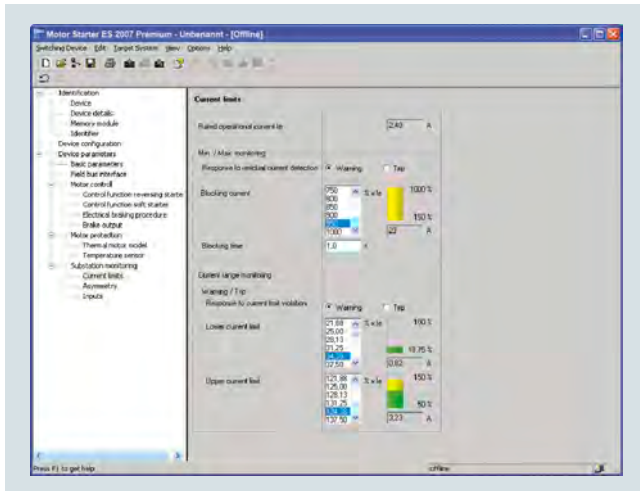
SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

**SIMATIC ET 200pro FC-2 frequency converter****Technical specifications**

Distributed frequency converter	<b>SIMATIC ET 200pro FC-2</b>				
Output frequency	0 ... 550 Hz				
Pulse frequency	4 kHz (standard), 4 ... 16 kHz (in 2-kHz increments)				
Standard SCCR (Short Circuit Current Rating)	10 kA				
Skipped frequency range	1, programmable				
Converter efficiency	95 ... 97 %				
Interfaces	<ul style="list-style-type: none"> <li>• Connection to PROFIBUS and PROFINET over the SIMATIC ET 200pro backplane bus</li> <li>• Mini USB interface for commissioning via PC (as from STARTER V4.4 plus SSP)</li> <li>• Optical interface for commissioning via the IOP-2 Handheld</li> <li>• Slot for an optional memory card (SD) for uploading or downloading parameter settings. Facilitates easy device replacement.</li> <li>• PTC, bimetal, KTY84, Pt1000 interface for motor temperature monitoring</li> </ul>				
<b>Functions</b>					
Open-loop/closed-loop control techniques	<ul style="list-style-type: none"> <li>• V/f control – linear (<math>M \sim n</math>) with/without flux current control (FCC), quadratic (<math>M \sim n^2</math>) or parameterizable</li> <li>• Vector control – sensorless</li> <li>• Closed-loop torque control</li> </ul>				
Operating functions	<ul style="list-style-type: none"> <li>• Jogging</li> <li>• BICO technology</li> <li>• Automatic restart following interruptions in operation due to a power failure</li> <li>• Smooth connection of converter to rotating motor</li> </ul>				
Braking functions	<ul style="list-style-type: none"> <li>• Integrated regenerative feedback functionality</li> <li>• Control of an electromagnetic holding brake</li> </ul>				
	Integrated brake control supplies DC power supply to the brake				
	Line voltage	380 V AC	400 V AC	440 V AC	480 V AC
	Rectified brake voltage	171 V DC	180 V DC	198 V DC	216 V DC
	Recommended brake coil voltage for Siemens motors	170 ... 200 V DC	170 ... 200 V DC 184 ... 218 V DC	184 ... 218 V DC	184 ... 218 V DC
	Disconnection on the DC side permits "fast" braking.				
Protective functions	<ul style="list-style-type: none"> <li>• Undervoltage</li> <li>• Overvoltage</li> <li>• Ground fault</li> <li>• Short-circuit</li> <li>• Stall protection</li> <li>• Thermal motor protection (<math>I^2t</math> or sensor)</li> <li>• Converter overtemperature</li> <li>• Motor blocking protection</li> <li>• Phase failure detection</li> </ul>				
Connectable motors	<ul style="list-style-type: none"> <li>• Low-voltage asynchronous (induction) motors</li> <li>• Motor cable lengths: max. 15 m (49 ft) (shielded)</li> </ul>				
<b>Mechanical data</b>					
Degree of protection	IP65				
Operating temperature	0 ... 55 °C (32 ... 131 °F)				
Mounting position	Vertical wall mounting (vertical alignment of the cooling fins)				
Dimensions (W x H x D)	155 mm x 246 mm x 248 mm (6.10 in x 9.69 in x 9.76 in)				
Weight, approx.	4 kg (8.8 lb)				
Standards					
Certificates of suitability	UL508C, cUL, CE, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU				



## Overview



Motor Starter ES for parameterization, monitoring, diagnostics and testing of motor starters

## More information

Industry Mall see [www.siemens.com/product?3ZS1](http://www.siemens.com/product?3ZS1)

Technical specifications and system requirements, see <https://support.industry.siemens.com/cs/ww/en/ps/16713/td>

Motor Starter ES is used for the startup, parameterization, diagnostics, documentation and preventive maintenance of SIMATIC ET 200S, ET 200pro, ECOFAST and M200D motor starters.

Interfacing is performed

- Via the local interface on the device
- With PROFIBUS DP-V1-capable motor starters from any point in PROFIBUS (applies to ET 200S DP V1/ET 200pro/ECOFAST/M200D)
- With PROFINET-capable motor starters from any point in PROFINET (applies to ET 200S DP V1/ET 200pro/M200D).

Using Motor Starter ES, the communication-capable motor starters are easily parameterized during startup, monitored during normal operation and successfully diagnosed for service purposes. Preventative maintenance is supported by a function for reading out diverse statistical data (e.g. operating hours, operating cycles, cut-off currents, etc.). The user is supported during these procedures with comprehensive Help functions and plain text displays.

Motor Starter ES can either be used as a stand-alone program or it can be integrated into STEP 7 via an Object Manager.

**Efficient engineering with three program versions**

The Motor Starter ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Motor Starter ES	Basic	Standard	Premium
ET 200S High Feature PROFIBUS IM	✓	✓	✓
ET 200S High Feature PROFINET IM	✓	✓	✓
ECOFAST AS-Interface High Feature	✓	✓	--
ECOFAST PROFIBUS	✓	✓	✓
ET 200pro PROFIBUS IM	✓	✓	✓
ET 200pro PROFINET IM	✓	✓	✓
M200D AS-Interface Standard	✓	✓	(✓)
M200D PROFIBUS	✓	✓	✓
M200D PROFINET	✓	✓	✓

✓ Function available, (✓) Available with restricted functionality

-- Function not available

Motor Starter ES	Basic	Standard	Premium
Access via the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	--	✓	✓
Creation of typicals	--	✓	✓
Comparison functions	--	✓	✓
Standard-compliant printout according to EN ISO 7200	--	✓	✓
Service data (slave pointer, statistics data)	--	✓	✓
Access via PROFIBUS	--	--	✓
Access via PROFINET	--	--	✓
S7 routing	--	--	✓
Teleservice via MPI	--	--	✓
STEP 7 object manager <sup>1)</sup>	--	--	✓
Trace function	--	✓	✓

✓ Function available

-- Function not available

<sup>1)</sup> Only for STEP 7 V5.x

**Additional functions**Standard-compliant printouts

The software tool greatly simplifies machine documentation. It enables parameterization printouts according to EN ISO 7200. The elements to be printed are easy to select and group as required.

Easy creation of typicals

Typicals can be created for devices and applications with only minimum differences in their parameters. These typicals contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be adapted, e.g. by the startup engineer.

Teleservice via MPI

The Motor Starter ES Premium version supports the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance, and it shortens response times for service purposes.

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

### ET 200pro software > Motor Starter ES

#### Benefits

- Fast, error-free configuration and startup of motor starters even without extensive previous knowledge
- Transparent setting of the device functions and their parameters – online and offline
- Effective diagnostics functions on the soft starter and display of the most important measured values
- Trace function (oscilloscope function) for recording measured values and events (included in the Motor Starter ES Standard and Premium software version for M200D PROFIBUS and PROFINET).

#### Selection and ordering data

##### Parameterization, startup and diagnostics software Motor Starter ES 2007

For ECOFAST Motor Starter, SIMATIC ET 200S High-Feature Starter, SIMATIC ET 200pro Starter and M200D (AS-I Standard, PROFIBUS, PROFINET)

- Delivered without PC cable

Version	Article No.
---------	-------------

##### Motor Starter ES 2007 Basic



###### Floating license for one user

Engineering software in limited-function version for diagnostics purposes, software and documentation on CD, 3 languages (German/English/French), communication via system interface

- License key on USB flash drive, Class A, including CD
- License key download, Class A, without CD

**3ZS1310-4CC10-0YA5**  
**3ZS1310-4CE10-0YB5**

3ZS1310-4CC10-0YA5

##### Motor Starter ES 2007 Standard



###### Floating license for one user

Engineering software, software and documentation on CD, 3 languages (German/English/French), communication via system interface

- License key on USB flash drive, Class A, including CD
- License key download, Class A, without CD

**3ZS1310-5CC10-0YA5**  
**3ZS1310-5CE10-0YB5**

3ZS1310-5CC10-0YA5

##### Motor Starter ES 2007 Premium



###### Floating license for one user

Engineering software, software and documentation on CD, 3 languages (German/English/French), communication via system interface or PROFIBUS/PROFINET, STEP 7 Object Manager

- License key on USB flash drive, Class A, including CD
- License key download, Class A, without CD

**3ZS1310-6CC10-0YA5**  
**3ZS1310-6CE10-0YB5**

3ZS1310-6CC10-0YA5

For a description of the software versions, [see page 10/419](#).

#### Accessories

Version	Article No.
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##### Optional accessories

###### RS 232 interface cable

Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS

**3RK1922-2BP00**

###### USB interface cable

Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS

**6SL3555-0PA00-2AA0**

###### USB/serial adapters

For connecting an RS 232 PC cable to the USB interface of a PC, recommended for use in conjunction with ET 200S/ECOFAST/ET 200pro motor starters

**3UF7946-0AA00-0**

### Overview

An interface module (EtherNet/IP adapter) is available for operating ET 200pro on EtherNet/IP.

It can be used together with system and IO components of the ET 200pro distributed I/O system.

### Ordering data

#### SIMATIC ET 200pro interface module for EtherNet/IP

Including:

- Bus terminating module for ET 200pro
- Companion disk with the manuals and the Configuration Tool

#### Article No.

**ZNX:EIP200PRO**

#### Article No.

#### Connecting module for EtherNet/IP

For connecting the interface module to EtherNet/IP

**ZNX:EIP200PROC1**

### Technical specifications

Article number	<b>ZNX:EIP200PRO</b> Ethernet/IP Head Assembly for ET 200PRO
<b>General information</b>	
Product type designation	Ethernet/IP
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
from supply voltage 1L+, max.	400 mA
<b>Power loss</b>	
Power loss, typ.	6 W
<b>Address area</b>	
<b>Addressing volume</b>	
• Inputs	255 byte
• Outputs	255 byte
<b>M12 port</b>	
• Autonegotiation	Yes
• Transmission rate, max.	100 Mbit/s
<b>Diagnostics indication LED</b>	
• For load voltage monitoring	Yes
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
<b>Potential separation</b>	
between backplane bus and electronics	Yes
between supply voltage and electronics	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C
• max.	55 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Dimensions</b>	
Width	135 mm
Height	130 mm
Depth	59.3 mm
<b>Weights</b>	
Weight, approx.	490 g

Article number	<b>ZNX:EIP200PROC1</b> ET 200pro, CM IM DP M12 / 7/8"
<b>Input current</b>	
from supply voltage 1L+, max.	No current input, only infeed current, max. 8 A
from load voltage 2L+ (without load), max.	No current input, only infeed current, max. 8 A
<b>Dimensions</b>	
Width	90 mm
Height	130 mm
Depth	51 mm
<b>Weights</b>	
Weight, approx.	540 g

## I/O systems

### SIMATIC ET 200 systems without control cabinet

#### SIMATIC ET 200AL

##### Overview



SIMATIC ET 200AL video

[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6141316253001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6141316253001)



##### Highlights

- Compact dimensions
- Low weight
- Safety-oriented collective shutdown of the outputs
- High degree of user-friendliness due to the following design features:
  - Flexible mounting in all positions possible due to screw fastening through the front or side
  - Direct installation on even surfaces or aluminum mounting rails
  - Labels for the identification of channels, modules and slots
  - Integrated cable tie opening
  - Clear and CAx-compliant interface designations
  - Uniform coloring of the system interfaces and system cables
  - 1:1 assignment of channel status LED, I/O socket and label
  - Pin assignment on the side
- I/O module portfolio comprising digital and analog modules, digital fail-safe module, IO-Link communications module and IO-Link I/O modules
- Ambient temperature range from -30 °C/-25 °C to +55 °C
- Extensive system functions
  - All interface and I/O modules support firmware update
  - Configuration control (option handling) via user software
  - System support of PROFlenergy for power saving purposes
  - Consistent use of identification and maintenance data IM0 to IM3/4 (electronic rating plate) for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.).

- Modular, distributed I/O system with compact I/O modules in IP65/67.
- Especially easy and flexible installation, even in extremely confined spaces.
- Easy wiring
- Easy commissioning
- SIMATIC ET 200AL consists of the following components:
  - Interface module for communication with IO Controllers on PROFINET.
  - Interface module for communication with all masters on the PROFIBUS.
  - BusAdapter for connection to the ET 200SP I/O system.
  - Various I/O modules, 30 mm and 45 mm wide.
  - IO-Link I/O modules for connection to IO-Link master
- Maximum configuration of an ET 200AL station:
  - Up to 32 I/O modules with PROFINET or PROFIBUS in any combination
  - Up to 16 I/O modules at the ET 200SP in any combination
- Connection of the modules via an internal backplane bus established using bus cables (ET connection).

## Overview



- Interface module for connecting ET 200AL to PROFIBUS
- As DPV1 slave it handles the data exchange with the PROFIBUS master in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 244 bytes, for input and output data respectively
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 99; can be set by means of rotary switch
- Identification and maintenance data IM0 ... IM3
- Firmware update
- Configuration management (option handling)

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>IM 157-1 DP interface module</b>	<b>6ES7157-1AA00-0AB0</b>	<b>M8 power cable</b>	
For connecting ET 200AL to PROFIBUS		4-pin	
<b>Accessories</b>		Pre-assembled at both ends, M8 connector and M8 socket	
<b>Bus cable for backplane bus (ET connection)</b>		0.19 m	<b>6ES7194-2LH02-1AA0</b>
4-pin, shielded		0.3 m	<b>6ES7194-2LH03-1AA0</b>
Pre-assembled at both ends, 2 M8 connectors		1 m	<b>6ES7194-2LH10-1AA0</b>
0.19 m	<b>6ES7194-2LH02-0AA0</b>	2 m	<b>6ES7194-2LH20-1AA0</b>
0.3 m	<b>6ES7194-2LH03-0AA0</b>	5 m	<b>6ES7194-2LH50-1AA0</b>
1 m	<b>6ES7194-2LH10-0AA0</b>	10 m	<b>6ES7194-2LN10-1AA0</b>
2 m	<b>6ES7194-2LH20-0AA0</b>	15 m	<b>6ES7194-2LN15-1AA0</b>
5 m	<b>6ES7194-2LH50-0AA0</b>	Pre-assembled at both ends, angled M8 connector and angled M8 socket	
10 m	<b>6ES7194-2LN10-0AA0</b>	0.3 m	<b>6ES7194-2LH03-1AB0</b>
15 m	<b>6ES7194-2LN15-0AA0</b>	1 m	<b>6ES7194-2LH10-1AB0</b>
Pre-assembled at both ends, 2 M8 connectors, angled		2 m	<b>6ES7194-2LH20-1AB0</b>
0.3 m	<b>6ES7194-2LH03-0AB0</b>	5 m	<b>6ES7194-2LH50-1AB0</b>
1 m	<b>6ES7194-2LH10-0AB0</b>	10 m	<b>6ES7194-2LN10-1AB0</b>
2 m	<b>6ES7194-2LH20-0AB0</b>	15 m	<b>6ES7194-2LN15-1AB0</b>
5 m	<b>6ES7194-2LH50-0AB0</b>	Pre-assembled at one end, M8 socket	
10 m	<b>6ES7194-2LN10-0AB0</b>	2 m	<b>6ES7194-2LH20-1AC0</b>
15 m	<b>6ES7194-2LN15-0AB0</b>	5 m	<b>6ES7194-2LH50-1AC0</b>
Pre-assembled at one end, 1 M8 connector		10 m	<b>6ES7194-2LN10-1AC0</b>
2 m	<b>6ES7194-2LH20-0AC0</b>	15 m	<b>6ES7194-2LN15-1AC0</b>
5 m	<b>6ES7194-2LH50-0AC0</b>	<b>M8 connector for ET connection</b>	<b>6ES7194-2AB00-0AA0</b>
10 m	<b>6ES7194-2LN10-0AC0</b>	4-pin, shielded	
15 m	<b>6ES7194-2LN15-0AC0</b>	<b>M8 power connector</b>	
		Male contact insert, 4-pin	<b>6ES7194-2AA00-0AA0</b>
		Female contact insert, 4-pin	<b>6ES7194-2AC00-0AA0</b>
		<b>ET connection FastConnect Stripping Tool</b>	<b>6ES7194-2KA00-0AA0</b>
		Stripping tool for stripping the ET connection bus cable	
		<b>Labels</b>	<b>6ES7194-2BA00-0AA0</b>
		10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Interface modules > IM 157-1 DP****Technical specifications**

Article number	<b>6ES7157-1AA00-0AB0</b> ET 200AL, IM 157-1 DP
<b>General information</b>	
Product type designation	IM 157-1 DP
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
<b>Input current</b>	
Current consumption (rated value)	50 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Address area</b>	
<b>Address space per station</b>	
• Address space per station, max.	244 byte
<b>Interfaces</b>	
Number of PROFIBUS interfaces	1
<b>1. Interface</b>	
Interface type	PROFIBUS DP
<b>Interface types</b>	
• RS 485	Yes
• M12 port	Yes; 2x M12 B-coded
<b>Protocols</b>	
• PROFIBUS DP slave	Yes
<b>Interface types</b>	
<b>RS 485</b>	
• Transmission rate, max.	12 Mbit/s
<b>PROFIBUS DP</b>	
<b>Services</b>	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV0	Yes
- DPV1	Yes

Article number	<b>6ES7157-1AA00-0AB0</b> ET 200AL, IM 157-1 DP
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Connection display DP	Yes; green LED
<b>Potential separation</b>	
between the load voltages	Yes
between PROFIBUS DP and all other circuit components	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety-related tripping of standard modules	Yes; From FS01
<b>Highest safety class achievable for safety-related tripping of standard modules</b>	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-30 °C
• max.	55 °C
<b>Connection method</b>	
Design of electrical connection for supply voltage	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	45 mm
Height	159 mm
Depth	46 mm
<b>Weights</b>	
Weight, approx.	211 g

## Overview



- Interface module for connecting ET 200AL to PROFINET
- Handles data exchange with the PROFINET I/O controller in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 1430 bytes, for input and output data respectively
- Shortest bus cycle 250 µs
- Automatic power-up by means of topology recognition
- Autocrossover
- Shared device on up to 4 IO controllers
- Support for the MRP (media redundancy protocol) and MRPD (media redundancy with planned duplication) functions
- Identification and maintenance data IM0 ... IM4
- Firmware update
- Configuration management (option handling)
- PROFlenergy

## Ordering data

## IM 157-1 PN interface module

For connecting ET 200AL to PROFINET

## Article No.

6ES7157-1AB00-0AB0

## Accessories

## Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends, 2 M8 connectors

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

Pre-assembled at both ends, 2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end, 1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

## Article No.

## Power cable M8

4-pin

Pre-assembled at both ends, M8 connector and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

Pre-assembled at both ends, angled M8 connector and angled M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

Pre-assembled at one end, M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0

## M8 connector for ET connection

6ES7194-2AB00-0AA0

4-pin, shielded

## M8 power connector

Male contact insert, 4-pin

6ES7194-2AA00-0AA0

Female contact insert, 4-pin

6ES7194-2AC00-0AA0

## ET connection FastConnect stripping tool

6ES7194-2KA00-0AA0

Stripping tool for stripping the ET connection bus cable

## Labels

6ES7194-2BA00-0AA0

10 x 5 mm, RAL 9016;  
5 frames with 40 labels each

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Interface modules > IM 157-1 PN****Technical specifications**

Article number	<b>6ES7157-1AB00-0AB0</b> ET 200AL, IM 157-1 PN
<b>General information</b>	
Product type designation	IM 157-1 PN
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M4
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3
• PROFINET from GSD version/GSD revision	GSDML V2.3.1
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
<b>Input current</b>	
Current consumption (rated value)	100 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Address area</b>	
<b>Address space per station</b>	
• Address space per station, max.	1 430 byte
<b>Interfaces</b>	
Number of PROFINET interfaces	1
<b>1. Interface</b>	
<b>Interface types</b>	
• M12 port	Yes; 2x M12 D-coded
• integrated switch	Yes
<b>Protocols</b>	
• PROFINET IO Device	Yes
• Open IE communication	Yes
<b>M12 port</b>	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	Yes; for Ethernet services
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
<b>Protocols</b>	
<b>PROFINET IO Device</b>	
<b>Services</b>	
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	Yes
<b>Open IE communication</b>	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes

Article number	<b>6ES7157-1AB00-0AB0</b> ET 200AL, IM 157-1 PN
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Connection display LINK TX/RX	Yes; 2x green LED
<b>Potential separation</b>	
between the load voltages	Yes
between PROFINET and all other circuits	Yes
<b>Standards, approvals, certificates</b>	
Suitable for safety-related tripping of standard modules	Yes; From FS01
<b>Highest safety class achievable for safety-related tripping of standard modules</b>	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C
• max.	55 °C
<b>Connection method</b>	
Design of electrical connection for supply voltage	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	45 mm
Height	159 mm
Depth	40 mm
<b>Weights</b>	
Weight, approx.	263 g



### Overview



- 30 and 45 mm wide modules with parameters and diagnostic functions
- 8-channel digital input module with M8 or M12 connection
- 16-channel digital input module with M12 connection
- 8-channel digital input/output module with M8 or M12 connection
- 16-channel digital input / output module with M12 connection
- 8-channel digital output module 2A with M12 connection

### Ordering data

#### Digital input modules

Article No.	Module Description
6ES7141-5BF00-0BA0	DI 8X24VDC, 8XM8
6ES7141-5AF00-0BA0	DI 8X24VDC, 4XM12
6ES7141-5AH00-0BA0	DI 16X24VDC, 8XM12

#### Digital output modules

Article No.	Module Description
6ES7142-5AF00-0BA0	DQ 8X24VDC/2A, 8XM12

#### Digital input/output modules

Article No.	Module Description
6ES7143-5BF00-0BA0	4 DIQ / 4 DQ, 24 V DC, 0.5 A
6ES7143-5AF00-0BA0	DIQ 4+DQ 4X24VDC/0.5A, 4XM12
6ES7143-5AH00-0BA0	DIQ 16X24VDC/0.5A, 8XM12

#### Accessories

##### Bus cable for backplane bus (ET connection)

Article No.	Module Description
	4-pin, shielded
	Pre-assembled at both ends, 2 M8 connectors
6ES7194-2LH02-0AA0	0.19 m
6ES7194-2LH03-0AA0	0.3 m
6ES7194-2LH10-0AA0	1 m
6ES7194-2LH20-0AA0	2 m
6ES7194-2LH50-0AA0	5 m
6ES7194-2LN10-0AA0	10 m
6ES7194-2LN15-0AA0	15 m
	Pre-assembled at both ends, 2 M8 connectors, angled
6ES7194-2LH03-0AB0	0.3 m
6ES7194-2LH10-0AB0	1 m
6ES7194-2LH20-0AB0	2 m
6ES7194-2LH50-0AB0	5 m
6ES7194-2LN10-0AB0	10 m
6ES7194-2LN15-0AB0	15 m
	Pre-assembled at one end, 1 M8 connector
6ES7194-2LH20-0AC0	2 m
6ES7194-2LH50-0AC0	5 m
6ES7194-2LN10-0AC0	10 m
6ES7194-2LN15-0AC0	15 m

#### Power cable M8

Article No.	Module Description
	4-pin
	Pre-assembled at both ends, M8 connector and M8 socket
6ES7194-2LH02-1AA0	0.19 m
6ES7194-2LH03-1AA0	0.3 m
6ES7194-2LH10-1AA0	1 m
6ES7194-2LH20-1AA0	2 m
6ES7194-2LH50-1AA0	5 m
6ES7194-2LN10-1AA0	10 m
6ES7194-2LN15-1AA0	15 m
	Pre-assembled at both ends, angled M8 connector and angled M8 socket
6ES7194-2LH03-1AB0	0.3 m
6ES7194-2LH10-1AB0	1 m
6ES7194-2LH20-1AB0	2 m
6ES7194-2LH50-1AB0	5 m
6ES7194-2LN10-1AB0	10 m
6ES7194-2LN15-1AB0	15 m
	Pre-assembled at one end, M8 socket
6ES7194-2LH20-1AC0	2 m
6ES7194-2LH50-1AC0	5 m
6ES7194-2LN10-1AC0	10 m
6ES7194-2LN15-1AC0	15 m

#### M8 connector for ET connection

Article No.	Module Description
6ES7194-2AB00-0AA0	4-pin, shielded

#### M8 power connector

Article No.	Module Description
6ES7194-2AA00-0AA0	Male contact insert, 4-pin
6ES7194-2AC00-0AA0	Female contact insert, 4-pin

#### ET connection FastConnect stripping tool

Article No.	Module Description
6ES7194-2KA00-0AA0	Stripping tool for stripping the ET connection bus cable

Article No.	Module Description
6ES7194-2BA00-0AA0	Labels 10 x 5 mm, RAL 9016; 5 frames with 40 plates each

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**I/O modules > Digital I/O modules****Technical specifications**

Article number	<b>6ES7141-5BF00-0BA0</b> ET 200AL, DI 8x24VDC, 8xM8	<b>6ES7141-5AF00-0BA0</b> ET 200AL, DI 8x24VDC, 4xM12	<b>6ES7141-5AH00-0BA0</b> ET 200AL, DI 16x24VDC, 8xM12
<b>General information</b>			
Product type designation	DI 8x24VDC	DI 8x24VDC	DI 16x24VDC
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
<b>Supply voltage</b>			
<b>Load voltage 1L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Input current</b>			
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	25 mA; without load 4 A; Maximum value	25 mA; without load 4 A; Maximum value	30 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
<b>Encoder supply</b>			
Number of outputs	8	4	8
<b>24 V encoder supply</b>			
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	Yes; per module, electronic
• Output current, max.	0.7 A; Total current of all encoders	0.7 A; Total current of all encoders	1.4 A; Total current of all encoders
<b>Digital inputs</b>			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs all mounting positions</b>			
- up to 55 °C, max.	8	8	16
<b>Input voltage</b>			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
<b>Input current</b>			
• for signal "1", typ.	3.2 mA	3.2 mA	3.2 mA
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
<b>Interrupts/diagnostics/ status information</b>			
<b>Alarms</b>			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnoses</b>			
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module
<b>Diagnostics indication LED</b>			
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED	Yes; green/red LED

#### Technical specifications

Article number	<b>6ES7141-5BF00-0BA0</b> ET 200AL, DI 8x24VDC, 8xM8	<b>6ES7141-5AF00-0BA0</b> ET 200AL, DI 8x24VDC, 4xM12	<b>6ES7141-5AH00-0BA0</b> ET 200AL, DI 16x24VDC, 8xM12
<b>Potential separation</b>			
between the load voltages	Yes	Yes	Yes
<b>Potential separation channels</b>			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No	No	No
<b>Standards, approvals, certificates</b>			
Suitable for safety-related tripping of standard modules	Yes; From FS01	Yes; From FS01	Yes; From FS01
<b>Highest safety class achievable for safety-related tripping of standard modules</b>			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-30 °C	-30 °C	-30 °C
• max.	55 °C	55 °C	55 °C
<b>Connection method</b>			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole
<b>ET-Connection</b>			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
<b>Dimensions</b>			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
<b>Weights</b>			
Weight, approx.	145 g	145 g	184 g
Article number	<b>6ES7142-5AF00-0BA0</b> ET 200AL, DQ 8x24VDC/2A, 8xM12	Article number	<b>6ES7142-5AF00-0BA0</b> ET 200AL, DQ 8x24VDC/2A, 8xM12
<b>General information</b>		<b>Input current</b>	
Product type designation	DQ 8x24VDC/2A	Current consumption (rated value)	40 mA; without load
<b>Engineering with</b>		from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V13 SP1 or higher	from load voltage 2L+, max.	4 A; Maximum value
• STEP 7 configurable/integrated from version	V5.5 SP4 Hotfix 7 or higher	<b>Digital outputs</b>	
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5	Number of digital outputs	8
• PROFINET from GSD version/GSD revision	GSDML V2.3.1	• in groups of	4; 2 load groups for 4 outputs each
<b>Supply voltage</b>		Short-circuit protection	Yes; per channel, electronic
<b>Load voltage 1L+</b>		<b>Switching capacity of the outputs</b>	
• Rated value (DC)	24 V	• on lamp load, max.	10 W
• Reverse polarity protection	Yes; against destruction; load increasing	<b>Load resistance range</b>	
<b>Load voltage 2L+</b>		• lower limit	12 Ω
• Rated value (DC)	24 V	• upper limit	4 kΩ
• Reverse polarity protection	Yes; against destruction; load increasing	<b>Output voltage</b>	
		• for signal "1", min.	L+ (-0.8 V)

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL

### I/O modules > Digital I/O modules

#### Technical specifications

Article number	<b>6ES7142-5AF00-0BA0</b> ET 200AL, DQ 8x24VDC/2A, 8xM12
<b>Output current</b>	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.1 Hz; 0.25 Hz at 25 °C
• on lamp load, max.	1 Hz
<b>Total current of the outputs</b>	
• Current per group, max.	4 A; For inductive load max. 2 channels per group
<b>Cable length</b>	
• unshielded, max.	30 m
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	Yes; channel by channel, parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnoses</b>	
• Short-circuit	Yes; Outputs to ground; module by module
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
<b>Potential separation</b>	
between the load voltages	Yes
<b>Potential separation channels</b>	
• between the channels, in groups of	4
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No; 4 channels are non-isolated and 4 channels are isolated from supply voltage 1L+

Article number	<b>6ES7142-5AF00-0BA0</b> ET 200AL, DQ 8x24VDC/2A, 8xM12
<b>Standards, approvals, certificates</b>	
Suitable for safety-related tripping of standard modules	Yes; From FS01
<b>Highest safety class achievable for safety-related tripping of standard modules</b>	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-30 °C
• max.	55 °C
<b>Connection method</b>	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	45 mm
Height	159 mm
Depth	40 mm
<b>Weights</b>	
Weight, approx.	192 g

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 8xM8	<b>6ES7143-5AF00-0BA0</b> ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 4xM12	<b>6ES7143-5AH00-0BA0</b> ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
<b>General information</b>			
Product type designation	DIQ 4+DQ 4x24VDC/0.5A	DIQ 4+DQ 4x24VDC/0.5A	DIQ 16x24VDC/0.5A
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V14 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
<b>Operating mode</b>			
• DI			Yes
• Counter			Yes
• DQ			Yes
<b>Supply voltage</b>			
<b>Load voltage 1L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up

#### Technical specifications

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	<b>6ES7143-5AF00-0BA0</b> ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	<b>6ES7143-5AH00-0BA0</b> ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
<b>Load voltage 2L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
<b>Input current</b>			
Current consumption (rated value)	40 mA; without load	40 mA; without load	75 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
<b>Encoder supply</b>			
Number of outputs	4	4	8
<b>24 V encoder supply</b>			
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	Yes; Per load voltage, electronic
• Output current, max.	0.7 A; Total current of all encoders	0.7 A; Total current of all encoders	1.4 A; Total current of all encoders, max. 0.7 A per load voltage
<b>Digital inputs</b>			
Number of digital inputs	4; Parameterizable as DIQ	4; Parameterizable as DIQ	16; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b>			
- up to 55 °C, max.	4	4	16
<b>Digital input functions, parameterizable</b>			
• Freely usable digital input			Yes
• Counter			Yes
<b>Input voltage</b>			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
<b>Input current</b>			
• for signal "1", typ.	3.2 mA	3.2 mA	3 mA
<b>Input delay (for rated value of input voltage)</b>			
<b>for standard inputs</b>			
- parameterizable			Yes
<b>for technological functions</b>			
- parameterizable			Yes
<b>Digital outputs</b>			
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable	8; 4 DQ fixed, 4 DIQ parameterizable	16; Parameterizable as DIQ
• in groups of	4; 2 load groups for 4 outputs each	4; 2 load groups for 4 outputs each	8; 2 load groups for 8 outputs each
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to			L+ (-53 V)
<b>Digital output functions, parameterizable</b>			
• Switching tripped by comparison values			Yes
• Freely usable digital output			Yes
<b>Switching capacity of the outputs</b>			
• on lamp load, max.	5 W	5 W	5 W
<b>Load resistance range</b>			
• lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
<b>Output voltage</b>			
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
<b>Output current</b>			
• for signal "1" rated value	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**I/O modules > Digital I/O modules****Technical specifications**

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	<b>6ES7143-5AF00-0BA0</b> ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	<b>6ES7143-5AH00-0BA0</b> ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
<b>Total current of the outputs</b>			
• Current per group, max.	2 A	2 A	4 A
<b>Cable length</b>			
• unshielded, max.	30 m	30 m	30 m
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
<b>Interrupts/diagnostics/ status information</b>			
Substitute values connectable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable
<b>Alarms</b>			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnoses</b>			
• Short-circuit	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module
<b>Diagnostics indication LED</b>			
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED	Yes; green/red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED	Yes; green LED
<b>Potential separation</b>			
between the load voltages	Yes	Yes	Yes
<b>Potential separation channels</b>			
• between the channels, in groups of	4; DIQ channels are isolated from DQ channels	4; DIQ channels are isolated from DQ channels	8
• between the channels and backplane bus	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; 8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
<b>Standards, approvals, certificates</b>			
Suitable for safety-related tripping of standard modules	Yes; From FS01	Yes; From FS01	
<b>Highest safety class achievable for safety-related tripping of standard modules</b>			
• Performance level according to ISO 13849-1	PL d	PL d	
• Category according to ISO 13849-1	Cat. 3	Cat. 3	
• SILCL according to IEC 62061	SILCL 2	SILCL 2	
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-30 °C	-30 °C	-30 °C
• max.	55 °C	55 °C	55 °C

**Technical specifications**

Article number	<b>6ES7143-5BF00-0BA0</b>	<b>6ES7143-5AF00-0BA0</b>	<b>6ES7143-5AH00-0BA0</b>
	ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
<b>Connection method</b>			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole
<b>ET-Connection</b>			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
<b>Dimensions</b>			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
<b>Weights</b>			
Weight, approx.	145 g	145 g	195 g

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL

I/O modules &gt; Analog I/O modules

**Overview**

- 30-mm wide module with parameters and diagnostic functions
- For connecting analog actuators and sensors without additional amplifiers
- 4-channel analog input modules with M12 connection
- 4-channel analog output module with M12 connection

**Ordering data****Article No.****Analog input modules**

AI 4xU/I/RTD, 4xM12

**6ES7144-5KD00-0BA0**

AI 4xRTD/TC, 4xM12

**6ES7144-5KD50-0BA0**

AQ 4xU/I, 4xM12

**6ES7145-5ND00-0BA0****Accessories****Bus cable for backplane bus (ET connection)**

4-pin, shielded

Pre-assembled at both ends,  
2 M8 connectors

0.19 m

**6ES7194-2LH02-0AA0**

0.3 m

**6ES7194-2LH03-0AA0**

1 m

**6ES7194-2LH10-0AA0**

2 m

**6ES7194-2LH20-0AA0**

5 m

**6ES7194-2LH50-0AA0**

10 m

**6ES7194-2LN10-0AA0**

15 m

**6ES7194-2LN15-0AA0**Pre-assembled at both ends,  
2 M8 connectors, angled

0.3 m

**6ES7194-2LH03-0AB0**

1 m

**6ES7194-2LH10-0AB0**

2 m

**6ES7194-2LH20-0AB0**

5 m

**6ES7194-2LH50-0AB0**

10 m

**6ES7194-2LN10-0AB0**

15 m

**6ES7194-2LN15-0AB0**Pre-assembled at one end,  
1 M8 connector

2 m

**6ES7194-2LH20-0AC0**

5 m

**6ES7194-2LH50-0AC0**

10 m

**6ES7194-2LN10-0AC0**

15 m

**6ES7194-2LN15-0AC0****Power cable M8**

4-pin

Pre-assembled at both ends,  
M8 connector and M8 socket

0.19 m

**6ES7194-2LH02-1AA0**

0.3 m

**6ES7194-2LH03-1AA0**

1 m

**6ES7194-2LH10-1AA0**

2 m

**6ES7194-2LH20-1AA0**

5 m

**6ES7194-2LH50-1AA0**

10 m

**6ES7194-2LN10-1AA0**

15 m

**6ES7194-2LN15-1AA0**Pre-assembled at both ends,  
angled M8 connector and angled  
M8 socket

0.3 m

**6ES7194-2LH03-1AB0**

1 m

**6ES7194-2LH10-1AB0**

2 m

**6ES7194-2LH20-1AB0**

5 m

**6ES7194-2LH50-1AB0**

10 m

**6ES7194-2LN10-1AB0**

15 m

**6ES7194-2LN15-1AB0**Pre-assembled at one end,  
M8 socket

2 m

**6ES7194-2LH20-1AC0**

5 m

**6ES7194-2LH50-1AC0**

10 m

**6ES7194-2LN10-1AC0**

15 m

**6ES7194-2LN15-1AC0****M8 connector for ET connection****6ES7194-2AB00-0AA0**

4-pin, shielded

**M8 power connector**

Male contact insert, 4-pin

**6ES7194-2AA00-0AA0**

Female contact insert, 4-pin

**6ES7194-2AC00-0AA0****ET connection FastConnect stripping tool****6ES7194-2KA00-0AA0**Stripping tool for stripping the  
ET connection bus cable**Labels****6ES7194-2BA00-0AA0**10 x 5 mm, RAL 9016;  
5 frames with 40 labels each



#### Technical specifications

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4xU/I/RTD, 4xM12	<b>6ES7144-5KD50-0BA0</b> ET 200AL, AI 4xRTD/TC, 4xM12
<b>General information</b>		
Product type designation	AI 4xU/I/RTD	AI 4xRTD/TC
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V16 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 and higher
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1	
<b>Supply voltage</b>		
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Input current</b>		
Current consumption (rated value)	35 mA; without load	25 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value
<b>Encoder supply</b>		
Number of outputs	4	
<b>24 V encoder supply</b>		
• Short-circuit protection	Yes; per channel, electronic	
• Output current, max.	0.5 A; Per channel, total current of all channels max. 1 A	
<b>Analog inputs</b>		
Number of analog inputs	4	4
• For current measurement	4	
• For voltage measurement	4	4
• For resistance/resistance thermometer measurement	4	4
• For thermocouple measurement		4
permissible input voltage for voltage input (destruction limit), max.	30 V	15 V
permissible input current for current input (destruction limit), max.	50 mA	
Constant measurement current for resistance-type transmitter, typ.		230 ... 300 µA
Cycle time (all channels), min.	8 ms	90 ms
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	
• 1 V to 5 V	Yes	
• -80 mV to +80 mV		Yes; 16 bit incl. sign
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**I/O modules > Analog I/O modules****Technical specifications**

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4xU/I/RTD, 4xM12	<b>6ES7144-5KD50-0BA0</b> ET 200AL, AI 4xRTD/TC, 4xM12
<b>Input ranges (rated values), thermocouples</b>		
<ul style="list-style-type: none"> <li>• Type B</li> <li>• Type C</li> <li>• Type E</li> <li>• Type J</li> <li>• Type K</li> <li>• Type L</li> <li>• Type N</li> <li>• Type R</li> <li>• Type S</li> <li>• Type T</li> <li>• Type U</li> </ul>		Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign
<b>Input ranges (rated values), resistance thermometer</b>		
<ul style="list-style-type: none"> <li>• Ni 100</li> <li>• Ni 1000</li> <li>• Pt 100</li> <li>• Pt 1000</li> </ul>	Yes; Standard/climate  Yes; Standard/climate	Yes; Standard/climate Yes; Standard/climate Yes; Standard/climate Yes; Standard/climate
<b>Input ranges (rated values), resistors</b>		
<ul style="list-style-type: none"> <li>• 0 to 150 ohms</li> <li>• 0 to 300 ohms</li> </ul>	Yes Yes	Yes Yes
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
<ul style="list-style-type: none"> <li>- parameterizable</li> <li>- internal temperature compensation</li> </ul>		Yes Yes
<b>Cable length</b>		
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	30 m	30 m
<b>Analog value generation for the inputs</b>		
Measurement principle	integrating	integrating
<b>Integration and conversion time/resolution per channel</b>		
<ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> <li>• Integration time, parameterizable</li> <li>• Integration time (ms)</li> <li>• Basic conversion time, including integration time (ms)</li> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> <li>• Conversion time (per channel)</li> </ul>	16 bit Yes; channel by channel 0,3 / 16,7 / 20 / 60 3 600 / 60 / 50 / 16.7 2 / 18 / 21 / 61 ms	16 bit Yes; channel by channel 16.7 / 20 / 60 18 / 21 / 61 ms 60 / 50 / 16.7
<b>Smoothing of measured values</b>		
<ul style="list-style-type: none"> <li>• parameterizable</li> </ul>	Yes	Yes
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
<ul style="list-style-type: none"> <li>• for voltage measurement</li> <li>• for current measurement as 2-wire transducer</li> <li>• for current measurement as 4-wire transducer</li> <li>• for resistance measurement with two-wire connection</li> <li>• for resistance measurement with three-wire connection</li> <li>• for resistance measurement with four-wire connection</li> </ul>	Yes Yes Yes Yes Yes Yes	Yes Yes Yes

**Technical specifications**

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4xU/I/RTD, 4xM12	<b>6ES7144-5KD50-0BA0</b> ET 200AL, AI 4xRTD/TC, 4xM12
<b>Errors/accuracies</b>		
Linearity error (relative to input range), (+/-)	0.025 %	0.025 %
Temperature error (relative to input range), (+/-)	0.01 %/K	0.01 %/K
Crosstalk between the inputs, max.	-70 dB	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.01 %	0.01 %; 0.02% for Pt1000
<b>Operational error limit in overall temperature range</b>		
• Voltage, relative to input range, (+/-)	0.35 %	0.35 %
• Current, relative to input range, (+/-)	0.45 %	0.45 %
• Resistance, relative to input range, (+/-)	0.25 %	0.25 %
• Resistance thermometer, relative to input range, (+/-)	0.25 %	0.25 %
• Thermocouple, relative to input range, (+/-)		TC type E, J, K, N, C, U, L: 0.35 %; TC type R, S, T: 0.4 %; TC type B: 0.45 %
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input range, (+/-)	0.25 %	0.25 %
• Current, relative to input range, (+/-)	0.25 %	0.25 %
• Resistance, relative to input range, (+/-)	0.15 %	0.15 %
• Resistance thermometer, relative to input range, (+/-)	0.15 %	0.15 %
• Thermocouple, relative to input range, (+/-)	0.25 %	0.25 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 0.5 \%)</math>, <math>f_1 =</math> interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnoses</b>		
• Wire-break	Yes; at 4 mA to 20 mA and 1 V to 5 V	Yes; Not for $\pm 80$ mV
• Short-circuit	Yes; Encoder supply to M, channel by channel	
• Overflow/underflow	Yes	Yes
<b>Diagnostics indication LED</b>		
• Channel status display	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
<b>Potential separation</b>		
between the load voltages	Yes	Yes
<b>Potential separation channels</b>		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
• between the channels and the power supply of the electronics	No	No

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**I/O modules > Analog I/O modules****Technical specifications**

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4xU/I/RTD, 4xM12	<b>6ES7144-5KD50-0BA0</b> ET 200AL, AI 4xRTD/TC, 4xM12
<b>Standards, approvals, certificates</b>		
Suitable for safety-related tripping of standard modules	Yes; From FS02	
Suitable for applications according to AMS 2750		Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9		Yes; Based on AMS 2750 E
<b>Highest safety class achievable for safety-related tripping of standard modules</b>		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SILCL according to IEC 62061	SILCL 2	
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-30 °C	-30 °C
• max.	55 °C	55 °C
<b>Connection method</b>		
Design of electrical connection for the inputs and outputs	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole
<b>ET-Connection</b>		
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded
<b>Dimensions</b>		
Width	30 mm	30 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
<b>Weights</b>		
Weight, approx.	168 g	168 g

Article number	<b>6ES7145-5ND00-0BA0</b> ET 200AL, AQ 4xU/I, 4xM12
<b>General information</b>	
Product type designation	AQ 4xU/I
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V14 or higher
• STEP 7 configurable/integrated from version	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.3.1
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; actuator power supply outputs applied with reversed polarity
<b>Input current</b>	
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	110 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Actuator supply</b>	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
<b>Output current</b>	
• Rated value	Total current 1 A up to 45 °C; 0.5 A up to 55 °C

Article number	<b>6ES7145-5ND00-0BA0</b> ET 200AL, AQ 4xU/I, 4xM12
<b>Analog outputs</b>	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	24 mA
Current output, no-load voltage, max.	15 V
Cycle time (all channels) max.	1 ms
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes; 15 bit
• 1 V to 5 V	Yes; 14 bit
• -10 V to +10 V	Yes; 16 bit incl. sign
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes; 15 bit
• -20 mA to +20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 14 bit
<b>Connection of actuators</b>	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
• for current output four-wire connection	Yes

#### Technical specifications

Article number	<b>6ES7145-5ND00-0BA0</b> ET 200AL, AQ 4xU/I, 4xM12
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	500 Ω
• with current outputs, inductive load, max.	1 mH
<b>Cable length</b>	
• shielded, max.	30 m
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
<b>Settling time</b>	
• for resistive load	1 ms
• for capacitive load	1 ms
• for inductive load	1 ms
<b>Errors/accuracies</b>	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %
Temperature error (relative to output range), (+/-)	0.005 %/K
Crosstalk between the outputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.03 %
<b>Operational error limit in overall temperature range</b>	
• Voltage, relative to output range, (+/-)	0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C
• Current, relative to output range, (+/-)	0.25 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to output range, (+/-)	0.15 %
• Current, relative to output range, (+/-)	0.15 %

Article number	<b>6ES7145-5ND00-0BA0</b> ET 200AL, AQ 4xU/I, 4xM12
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	Yes; channel by channel, parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnoses</b>	
• Wire-break	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes; Actuator supply module by module; channel by channel for output type "voltage"
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
<b>Potential separation</b>	
between the load voltages	Yes
<b>Potential separation channels</b>	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-30 °C
• max.	55 °C
<b>Connection method</b>	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	30 mm
Height	159 mm
Depth	40 mm
<b>Weights</b>	
Weight, approx.	175 g

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL

### I/O modules > Fail-safe I/O modules

#### Overview



The ET 200AL fail-safe I/O module expands the ET 200AL PN system family. It is incorporated seamlessly into the Safety Integrated concept of SIMATIC. It also supports safety-related communication via PROFIsafe. The functional safety is certified in accordance with IEC 61508. It is designed for safety-related use up to SIL 3 according to IEC 62061 and PL e according to ISO 13849.

The following fail-safe I/O module with 4x digital inputs and 2x digital outputs with 45 mm width is available:

- F-DI 4+F-DQ 2x24VDC/2A, 4xM12 PROFIsafe

#### Ordering data

##### Fail-safe digital input/output modules

F-DI 4+F-DQ 2x24VDC/2A, 4xM12

#### Article No.

6ES7146-5FF00-0BA0

##### Accessories

##### M12 Y cable

For connection of single-channel sensors (1oo1 evaluation), 5-pin

6ES7194-6KB00-0XA0

For joint connection of an F-DQ and an F-DI channel by means of an 8-pin M12 socket

6ES7194-6KC00-0XA0

##### E-coding plug (metal) for fail-safe ET 200 distributed I/O, IP65/67

6ES7194-6KB01-0AA0

##### Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends, 2 M8 plugs

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

Pre-assembled at both ends, 2 M8 plugs, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end, 1 M8 plug

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

#### Article No.

##### M8 power cable

4-pin

Pre-assembled at both ends, M8 plug and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

Pre-assembled at both ends, angled M8 plug and angled M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

Pre-assembled at one end, M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0

##### M8 plug for ET connection

6ES7194-2AB00-0AA0

4-pin, shielded

##### M8 power connector

Male contact insert, 4-pin

6ES7194-2AA00-0AA0

Female contact insert, 4-pin

6ES7194-2AC00-0AA0

##### ET connection FastConnect stripping tool

6ES7194-2KA00-0AA0

Stripping tool for stripping the ET connection bus cable

##### Labels, yellow

6ES7194-2BB00-0AA0

10 x 5 mm;  
5 frames with 40 labels each

### Technical specifications

Article number	<b>6ES7146-5FF00-0BA0</b> ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
<b>General information</b>	
Product type designation	F-DI 4+F-DQ 2x24VDC/2A, 4xM12
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V17 or higher
<b>Operating mode</b>	
• DI	Yes
• DQ	Yes
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; outputs applied with reversed polarity for loads connected between M-switch and 2L+ will conduct
<b>Input current</b>	
Current consumption (rated value)	55 mA (1L+) / 40 mA (2L+); without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Encoder supply</b>	
Number of outputs	2
<b>24 V encoder supply</b>	
• Short-circuit protection	Yes; per load voltage, electronic (response threshold 0.7 A to 1.7 A)
• Output current, max.	1 A; total current of all encoders, max. 0.5 A per load voltage; maximum of 2.0 V drop
<b>Digital inputs</b>	
Number of digital inputs	4
<b>Number of simultaneously controllable inputs</b>	
<b>all mounting positions</b>	
- up to 55 °C, max.	4
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
<b>Input current</b>	
• for signal "1", typ.	4.85 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- parameterizable	Yes
<b>Digital outputs</b>	
Number of digital outputs	2
• in groups of	2
Short-circuit protection	Yes; per channel, electronic
Overload protection	Yes
Limitation of inductive shutdown voltage to	P-switch: -26 V DC referenced to 2M, M-switch: +48 V DC referenced to 2M

Article number	<b>6ES7146-5FF00-0BA0</b> ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	10 W
<b>Load resistance range</b>	
• lower limit	12 Ω
• upper limit	2 kΩ
<b>Output voltage</b>	
• for signal "1", min.	L+ (-2.0 V), P-switch is L+ (-1.5 V), M-switch is 0.5 V
<b>Output current</b>	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA
<b>Switching frequency</b>	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per group, max.	4 A
<b>Cable length</b>	
• unshielded, max.	30 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	No
- permissible quiescent current (2-wire sensor), max.	0.5 mA
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	No
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; outputs when off
• Short-circuit	Yes; inputs, outputs, encoder supply
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
<b>Potential separation</b>	
between the load voltages	Yes
<b>Potential separation channels</b>	
• between the channels, in groups of	4 DI channels are isolated from 2 DQ channels
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	DI channels are non-isolated from supply voltage 1L+ and DQ channels are isolated from the supply voltage 1L+

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules &gt; Fail-safe I/O modules

**Technical specifications**

Article number	<b>6ES7146-5FF00-0BA0</b> ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
<ul style="list-style-type: none"> <li>Performance level according to ISO 13849-1</li> <li>SIL acc. to IEC 61508</li> </ul>	PLd (DI single-channel), PLe (DI two-channel, DQ)  SIL 2 (DI single-channel), SIL 3 (DI two-channel, DQ)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-30 °C 55 °C

Article number	<b>6ES7146-5FF00-0BA0</b> ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
<b>Connection method</b>	
Design of electrical connection for the inputs and outputs	M12, 5-pin
Design of electrical connection for supply voltage	M8, 4-pin
<b>ET-Connection</b>	
<ul style="list-style-type: none"> <li>ET-Connection</li> </ul>	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	45 mm
Height	159 mm
Depth	40 mm
<b>Weights</b>	
Weight, approx.	220 g



### Overview



- 30 mm-wide CM IO-Link communications module
- For the connection of up to 4 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B
- The IO-Link parameters are configured using the S7-PCT Port Configuration Tool, V3.2 and higher.

### Ordering data

#### CM IO-Link

CM 4X IO-Link, 4XM12;  
for the connection of up to  
4 IO-Link devices according to  
IO-Link Specification V1.0 and V1.1  
and port Class B

#### Article No.

6ES7147-5JD00-0BA0

#### Accessories

#### Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,  
2 M8 connectors

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

Pre-assembled at both ends,  
2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end,  
1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

#### Article No.

#### Power cable M8

4-pin

Pre-assembled at both ends,  
M8 connector and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

Pre-assembled at both ends,  
angled M8 connector and angled  
M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

Pre-assembled at one end,  
M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0

#### M8 connector for ET connection

6ES7194-2AB00-0AA0

4-pin, shielded

#### M8 power connector

Male contact insert, 4-pin

6ES7194-2AA00-0AA0

Female contact insert, 4-pin

6ES7194-2AC00-0AA0

#### ET connection FastConnect stripping tool

6ES7194-2KA00-0AA0

Stripping tool for stripping the  
ET connection bus cable

#### Labels

6ES7194-2BA00-0AA0

10 x 5 mm, RAL 9016;  
5 frames with 40 labels each

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**I/O modules > Communication > CM IO-Link****Technical specifications**

Article number	<b>6ES7147-5JD00-0BA0</b> ET 200AL, cm 4x IO-Link, 4xM12
<b>General information</b>	
Product type designation	CM 4x IO-Link
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
<b>Input current</b>	
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	40 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Encoder supply</b>	
Number of outputs	4
<b>24 V encoder supply</b>	
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	1.4 A; Total current of all ports
<b>IO-Link</b>	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Size of process data, input per port	32 byte
Size of process data, input per module	32 byte
Size of process data, output per port	32 byte
Size of process data, output per module	32 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	Possible with function block IO_LINK_MASTER
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
<b>Operating modes</b>	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
<b>Connection of IO-Link devices</b>	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: 1.6 A total current of all ports

Article number	<b>6ES7147-5JD00-0BA0</b> ET 200AL, cm 4x IO-Link, 4xM12
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
<b>Potential separation</b>	
between the load voltages	Yes
<b>Potential separation channels</b>	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
<b>Standards, approvals, certificates</b>	
Suitable for safety-related tripping of standard modules	Yes; From FS01
<b>Highest safety class achievable for safety-related tripping of standard modules</b>	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C
• max.	55 °C
<b>Connection method</b>	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	30 mm
Height	159 mm
Depth	40 mm
<b>Weights</b>	
Weight, approx.	145 g

### Overview



The IO-Link communication standard enables and standardizes communication between machine and plant PLCs, on the one hand, and sensors, actuators and other field devices, on the other hand.

The IO-Link I/O modules enable the simple connection of binary standard sensors and actuators, whereby the signals and energy supply are transferred via IO-Link (IO-Link master).

The IO-Link I/O modules can be connected to any IO-Link masters and, in this way, fieldbus-independent and distributed I/O units can be formed. The universal usage of the IO-Link DIQ I/O modules enables additional flexibility here.

With the ET 200AL IO-Link I/O modules, a comprehensive portfolio of digital input, output and input/output modules with the design and system features of the ET 200AL is available.

Ordering data	Article No.	Ordering data	Article No.
<b>IO-Link digital input modules</b> Degree of protection IP67 • DI 8x 24VDC, 8x M8 • DI 16x 24VDC, 8x M12	<b>6ES7141-5BF00-0BL0</b> <b>6ES7141-5AH00-0BL0</b>	<b>Control connecting cable M12-180/M12-180</b> Flexible 5-core cable, pre-assembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket, both ends with a straight cable outlet, for connection of IO-Link sensors/actuators • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	<b>6XV1801-2CE50</b> <b>6XV1801-2CH10</b> <b>6XV1801-2CH15</b> <b>6XV1801-2CH20</b> <b>6XV1801-2CH30</b> <b>6XV1801-2CH50</b> <b>6XV1801-2CN10</b> <b>6XV1801-2CN15</b>
<b>IO-Link digital output modules</b> Degree of protection IP67 • DQ 8x 24VDC/2A, 8x M12	<b>6ES7142-5AF00-0BL0</b>	<b>Power M12 cable connector PRO</b> Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit	<b>6GK1906-0EB00</b>
<b>IO-Link digital input/output modules</b> Degree of protection IP67 • DIQ 4+DQ 4x 24VDC/0.5A, 8x M8 • DIQ 16x24VDC/0.5A, 8x M12	<b>6ES7143-5BF00-0BL0</b> <b>6ES7143-5AH00-0BL0</b>	<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro	<b>3RX9802-0AA00</b>
<b>Accessories</b> <b>Control connecting cable 5 x 0.25</b> Flexible IO-Link cable with 5 copper cores (0.25 mm <sup>2</sup> ) for connecting IO-Link sensors/actuators (IO-Link port class B); sold by the meter; max. delivery unit 1 000 m minimum order quantity 20 m	<b>6XV1801-2C</b>	<b>M12 sealing cap for IP67 modules</b> 15 mm external diameter, with O-ring, 10 units	<b>3RK1901-1KA00</b>
<b>M12 coupler plug</b> Can be assembled, for connecting actuators or sensors, 5-pin, screw connection, max. 0.75 mm <sup>2</sup> , A-coded, max. 4 A • Straight • Angled	<b>3RK1902-4BA00-5AA0</b> <b>3RK1902-4DA00-5AA0</b>	<b>M8 sealing cap</b> For IP67 modules	<b>3RK1901-1PN00</b>
<b>Control line</b> Pre-assembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm <sup>2</sup> , A-coded, max. 4 A, PUR casing, black • 1.5 m • 5 m • 10 m	<b>3RK1902-4HB15-5AA0</b> <b>3RK1902-4HB50-5AA0</b> <b>3RK1902-4HC01-5AA0</b>	<b>M12 Y cable</b> For double connection of I/O by means of a single cable on ET 200, 5-pin	<b>6ES7194-6KA00-0XA0</b>
		<b>Energy Cable 4 x 1.5</b> Energy cable, suitable for cable carriers, with 4 copper cores (1.5 mm <sup>2</sup> ) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1801-2B</b>

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL

### IO-Link I/O modules

#### Ordering data

##### M12 Power connecting cable M12-180/M12-180

Flexible 4-core power connecting cable, pre-assembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC

Length:

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

#### Article No.

6XV1801-6DE50  
6XV1801-6DH10  
6XV1801-6DH15  
6XV1801-6DH20  
6XV1801-6DH30  
6XV1801-6DH50  
6XV1801-6DN10  
6XV1801-6DN15

##### M12 Power connecting cable M12-90/M12-90

Flexible 4-core power connecting cable, pre-assembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC

Length:

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

#### Article No.

6XV1801-6GE50  
6XV1801-6GH10  
6XV1801-6GH15  
6XV1801-6GH20  
6XV1801-6GH30  
6XV1801-6GH50  
6XV1801-6GN10  
6XV1801-6GN15

#### Labels

10 x 5 mm, RAL 9016;  
5 frames with 40 labels each

6ES7194-2BA00-0AA0

#### Technical specifications

Article number	6ES7141-5BF00-0BL0 ET 200AL, IO-Link, DI 8x24VDC, 8xM8	6ES7141-5AH00-0BL0 ET 200AL, IO-Link, DI 16x24VDC, 8xM12
<b>General information</b>		
Product type designation	DI 8x24VDC	DI 16x24VDC
<b>Engineering with</b>		
• IODD file	Yes	Yes
<b>Supply voltage</b>		
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V; Supply from 1Us+ of the IO-Link master	24 V; Supply from 1Us+ of the IO-Link master
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Input current</b>		
Current consumption (rated value)	15 mA; without load	20 mA; without load
<b>Encoder supply</b>		
Number of outputs	8; Supply from 1Us+ of the IO-Link master	8; Supply from 1Us+ of the IO-Link master
<b>24 V encoder supply</b>		
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic
• Output current, max.	0.7 A; Total current of all encoders (depending on IO-Link master supply via 1Us+)	0.7 A; Total current of all encoders (depending on IO-Link master supply via 1Us+)
<b>Digital inputs</b>		
Number of digital inputs	8	16
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
<b>Number of simultaneously controllable inputs</b>		
<b>all mounting positions</b>		
- up to 55 °C, max.	8	16
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal *0*	-30 to +5 V	-30 to +5 V
• for signal *1*	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal *1*, typ.	3 mA	3 mA
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

**Technical specifications**

Article number	<b>6ES7141-5BF00-0BLO</b>	<b>6ES7141-5AH00-0BLO</b>
	ET 200AL, IO-Link, DI 8x24VDC, 8xM8	ET 200AL, IO-Link, DI 16x24VDC, 8xM12
<b>IO-Link</b>		
IO-Link protocol 1.1	Yes	Yes
Transmission rate	38.4 kBd (COM2)	38.4 kBd (COM2)
Cycle time, min.	2.1 ms	2.5 ms
Size of process data, input per module	1 byte	2 byte
Size of process data, output per module	0 byte	0 byte
Supported IO-Link profiles	common profile	common profile
Cable length unshielded, max.	20 m	20 m
<b>Connection of IO-Link devices</b>		
• Port type A	Yes	Yes
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnoses</b>		
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module
<b>Diagnostics indication LED</b>		
• Channel status display	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-30 °C	-30 °C
• max.	55 °C	55 °C
<b>Connection method</b>		
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pin, A-coded
Type of electrical connection for IO-Link	M12, 5-pin, A-coded	M12, 5-pin, A-coded
<b>Dimensions</b>		
Width	30 mm	45 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
<b>Weights</b>		
Weight, approx.	124 g	155 g

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**IO-Link I/O modules****Technical specifications**

Article number	<b>6ES7142-5AF00-0BLO</b> ET 200AL, IO-Link, DQ 8x24VDC/2A, 8xM12
<b>General information</b>	
Product type designation	DQ 8x24VDC/2A
<b>Engineering with</b>	
• IODD file	Yes
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V; Supply from 1Us+ of the IO-Link master
• Reverse polarity protection	Yes; against destruction
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V; Supply via M12 connector L-coded
• Reverse polarity protection	Yes; against destruction; load increasing
<b>Input current</b>	
Current consumption (rated value) from load voltage 2L+, max.	12 mA; without load 8 A; Maximum value
<b>Digital outputs</b>	
Number of digital outputs	8
Short-circuit protection	Yes; per channel, electronic
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	10 W
<b>Load resistance range</b>	
• lower limit	12 Ω
• upper limit	4 kΩ
<b>Output voltage</b>	
• for signal "1", min.	L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	2 A (45 °C); 1 A (55 °C)
• for signal "0" residual current, max.	0.5 mA
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.1 Hz; 0.25 Hz at 25 °C
• on lamp load, max.	1 Hz
<b>Total current of the outputs</b>	
• Current per module, max.	8 A
<b>Cable length</b>	
• unshielded, max.	30 m

Article number	<b>6ES7142-5AF00-0BLO</b> ET 200AL, IO-Link, DQ 8x24VDC/2A, 8xM12
<b>IO-Link</b>	
IO-Link protocol 1.1	Yes
Transmission rate	38.4 kBd (COM2)
Cycle time, min.	2.1 ms
Size of process data, input per module	0 byte
Size of process data, output per module	1 byte
Supported IO-Link profiles	common profile
Cable length unshielded, max.	20 m
<b>Connection of IO-Link devices</b>	
• Port type A	Yes
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	Yes; channel by channel, parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnoses</b>	
• Short-circuit	Yes; Outputs to ground; module by module
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
<b>Potential separation</b>	
between the load voltages	Yes
<b>Potential separation channels</b>	
• between the channels	No
• between the channels and the power supply of the electronics	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-30 °C
• max.	55 °C
<b>Connection method</b>	
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Type of electrical connection for IO-Link	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
<b>Dimensions</b>	
Width	45 mm
Height	159 mm
Depth	45 mm
<b>Weights</b>	
Weight, approx.	168 g

### Technical specifications

Article number	<b>6ES7143-5BF00-0BL0</b> ET 200AL, IO-Link, DIQ 4+DQ 4x24VDC/0,5A	<b>6ES7143-5AH00-0BL0</b> ET 200AL, IO-Link, DIQ 16x24VDC/0,5A
<b>General information</b>		
Product type designation	DIQ 4+DQ 4X24VDC/0.5A, 8xM8	DIQ 16X24VDC/0.5A, 8XM12
<b>Engineering with</b>		
• IODD file	Yes	Yes
<b>Supply voltage</b>		
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V; Supply from 1Us+ of the IO-Link master	24 V; Supply from 1Us+ of the IO-Link master
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V; Supply from 2UA+ of the IO-Link master	24 V; Supply from 2UA+ of the IO-Link master
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
<b>Input current</b>		
Current consumption (rated value)	15 mA; without load	20 mA; without load
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value
<b>Encoder supply</b>		
Number of outputs	8; Supply from 2UA+ of the IO-Link master	8; Supply from 2UA+ of the IO-Link master
<b>24 V encoder supply</b>		
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic
• Output current, max.	0.7 A; Total current of all encoders (depending on IO-Link master supply via 2UA+)	0.7 A; Total current of all encoders (depending on IO-Link master supply via 2UA+)
<b>Digital inputs</b>		
Number of digital inputs	4; Parameterizable as DIQ	16; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
<b>Number of simultaneously controllable inputs all mounting positions</b>		
- up to 55 °C, max.	4	16
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal *0*	-3 to +5V	-3 to +5V
• for signal *1*	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal *1*, typ.	3 mA	3 mA
<b>Digital outputs</b>		
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable	16; Parameterizable as DIQ
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-50 V)	2L+ (-50 V)
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	5 W
<b>Load resistance range</b>		
• lower limit	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ
<b>Output voltage</b>		
• for signal *1*, min.	L+ (-0.8 V)	L+ (-0.8 V)
<b>Output current</b>		
• for signal *1* rated value	0.5 A	0.5 A
• for signal *0* residual current, max.	0.5 mA	0.5 mA
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
<b>Total current of the outputs</b>		
• Current per module, max.	4 A	4 A
<b>Cable length</b>		
• unshielded, max.	30 m	30 m

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**IO-Link I/O modules****Technical specifications**

Article number	<b>6ES7143-5BF00-0BLO</b> ET 200AL, IO-Link, DIQ 4+DQ 4x24VDC/0,5A	<b>6ES7143-5AH00-0BLO</b> ET 200AL, IO-Link, DIQ 16x24VDC/0,5A
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>IO-Link</b>		
IO-Link protocol 1.1	Yes	Yes
Transmission rate	38.4 kBd (COM2)	38.4 kBd (COM2)
Cycle time, min.	2.4 ms	3 ms
Size of process data, input per module	1 byte	2 byte
Size of process data, output per module	1 byte	2 byte
Supported IO-Link profiles	common profile	common profile
Cable length unshielded, max.	20 m	20 m
<b>Connection of IO-Link devices</b>		
• Port type B	Yes	Yes
<b>Interrupts/diagnostics/ status information</b>		
Substitute values connectable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnoses</b>		
• Short-circuit	Yes; outputs to ground; encoder supply to ground; module by module	Yes; outputs to ground; encoder supply to ground; module by module
<b>Diagnostics indication LED</b>		
• Channel status display	Yes; green LED	Yes; green LED
• For module diagnostics	Yes; green/red LED	Yes; green/red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED
<b>Potential separation</b>		
between the load voltages	Yes	Yes
<b>Potential separation channels</b>		
• between the channels	No	No
• between the channels and the power supply of the electronics	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-30 °C	-30 °C
• max.	55 °C	55 °C
<b>Connection method</b>		
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pin, A-coded
Type of electrical connection for IO-Link	M12, 5-pin, A-coded	M12, 5-pin, A-coded
<b>Dimensions</b>		
Width	30 mm	45 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
<b>Weights</b>		
Weight, approx.	125 g	157 g



### Overview

- Pre-assembled cables in various designs and lengths:
  - For connecting the interface modules and I/O modules via the internal backplane bus (ET connection).
  - For power supply.

### Ordering data

#### Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends, 2 M8 connectors

0.19 m

**6ES7194-2LH02-0AA0**

0.3 m

**6ES7194-2LH03-0AA0**

1 m

**6ES7194-2LH10-0AA0**

2 m

**6ES7194-2LH20-0AA0**

5 m

**6ES7194-2LH50-0AA0**

10 m

**6ES7194-2LN10-0AA0**

15 m

**6ES7194-2LN15-0AA0**

PUR line, pre-assembled at both ends, 2 M8 connectors

0.19 m

**6ES7194-2MH02-0AA0**

0.3 m

**6ES7194-2MH03-0AA0**

1 m

**6ES7194-2MH10-0AA0**

2 m

**6ES7194-2MH20-0AA0**

5 m

**6ES7194-2MH50-0AA0**

10 m

**6ES7194-2MN10-0AA0**

15 m

**6ES7194-2MN15-0AA0**

PUR line, pre-assembled at both ends, 2 M8 connectors, angled

0.3 m

**6ES7194-2MH03-0AB0**

1 m

**6ES7194-2MH10-0AB0**

2 m

**6ES7194-2MH20-0AB0**

5 m

**6ES7194-2MH50-0AB0**

10 m

**6ES7194-2MN10-0AB0**

15 m

**6ES7194-2MN15-0AB0**

Pre-assembled at both ends, 2 M8 connectors, angled

0.3 m

**6ES7194-2LH03-0AB0**

1 m

**6ES7194-2LH10-0AB0**

2 m

**6ES7194-2LH20-0AB0**

5 m

**6ES7194-2LH50-0AB0**

10 m

**6ES7194-2LN10-0AB0**

15 m

**6ES7194-2LN15-0AB0**

Pre-assembled at one end, 1 M8 connector

2 m

**6ES7194-2LH20-0AC0**

5 m

**6ES7194-2LH50-0AC0**

10 m

**6ES7194-2LN10-0AC0**

15 m

**6ES7194-2LN15-0AC0**

PUR line, pre-assembled at one end, 1 M8 connector

2 m

**6ES7194-2MH20-0AC0**

5 m

**6ES7194-2MH50-0AC0**

10 m

**6ES7194-2MN10-0AC0**

15 m

**6ES7194-2MN15-0AC0**

#### Connecting cable for bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends, 2 M8 connectors. 0.2 m

**6ES7194-2LH02-0AD0**

PUR line, pre-assembled at both ends, 2 M8 connectors. 0.2 m

**6ES7194-2MH02-0AD0**

#### Power cable M8

4-pin

Pre-assembled at both ends, M8 connector and M8 socket

0.19 m

**6ES7194-2LH02-1AA0**

0.3 m

**6ES7194-2LH03-1AA0**

1 m

**6ES7194-2LH10-1AA0**

2 m

**6ES7194-2LH20-1AA0**

5 m

**6ES7194-2LH50-1AA0**

10 m

**6ES7194-2LN10-1AA0**

15 m

**6ES7194-2LN15-1AA0**

PUR line, pre-assembled at both ends, M8 connector and M8 socket

0.19 m

**6ES7194-2MH02-1AA0**

0.3 m

**6ES7194-2MH03-1AA0**

1 m

**6ES7194-2MH10-1AA0**

2 m

**6ES7194-2MH20-1AA0**

5 m

**6ES7194-2MH50-1AA0**

10 m

**6ES7194-2MN10-1AA0**

15 m

**6ES7194-2MN15-1AA0**

Pre-assembled at both ends, angled M8 connector and angled M8 socket

0.3 m

**6ES7194-2LH03-1AB0**

1 m

**6ES7194-2LH10-1AB0**

2 m

**6ES7194-2LH20-1AB0**

5 m

**6ES7194-2LH50-1AB0**

10 m

**6ES7194-2LN10-1AB0**

15 m

**6ES7194-2LN15-1AB0**

PUR line, pre-assembled at both ends, angled M8 connector and angled M8 socket

0.3 m

**6ES7194-2MH03-1AB0**

1 m

**6ES7194-2MH10-1AB0**

2 m

**6ES7194-2MH20-1AB0**

5 m

**6ES7194-2MH50-1AB0**

10 m

**6ES7194-2MN10-1AB0**

15 m

**6ES7194-2MN15-1AB0**

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Accessories > Cables and connectors**

Ordering data	Article No.	Article No.
<b>Power cable M8 (continued)</b>		<b>M8 connector for ET connection</b>
Pre-assembled at one end, M8 socket		4-pin, shielded
2 m	<b>6ES7194-2LH20-1AC0</b>	<b>M8 power connector</b>
5 m	<b>6ES7194-2LH50-1AC0</b>	Male contact insert, 4-pin
10 m	<b>6ES7194-2LN10-1AC0</b>	Female contact insert, 4-pin
15 m	<b>6ES7194-2LN15-1AC0</b>	<b>ET connection FastConnect stripping tool</b>
PUR line, pre-assembled at one end, M8 socket		Stripping tool for stripping the ET connection bus cable
2 m	<b>6ES7194-2MH20-1AC0</b>	
5 m	<b>6ES7194-2MH50-1AC0</b>	
10 m	<b>6ES7194-2MN10-1AC0</b>	
15 m	<b>6ES7194-2MN15-1AC0</b>	

**Technical specifications**

Article number	<b>6ES7194-2LH02-0AA0</b>	<b>6ES7194-2LH03-0AA0</b>	<b>6ES7194-2LH10-0AA0</b>	<b>6ES7194-2LH20-0AA0</b>	<b>6ES7194-2LH50-0AC0</b>	<b>6ES7194-2LN10-0AA0</b>	<b>6ES7194-2LN15-0AA0</b>
Connecting Cable	Connecting Cable	Connecting Cable	Connecting Cable	Connecting Cable	Connecting Cable	Bus Cable	Bus Cable
ET-Connection, 0,19m	ET-Connection, 0,3m	ET-Connection, 1,0M	ET-Connection, 2,0M	ET-Connection, 5,0M	ET-Connection, 10m	ET-Connection, 15m	ET-Connection, 15m
<b>General information</b>							
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Ambient conditions</b>							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Ambient temperature during storage/transportation</b>							
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>							
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm

**Technical specifications**

Article number	<b>6ES7194-2LH02-0AA0</b>	<b>6ES7194-2LH03-0AA0</b>	<b>6ES7194-2LH10-0AA0</b>	<b>6ES7194-2LH20-0AA0</b>	<b>6ES7194-2LH50-0AC0</b>	<b>6ES7194-2LN10-0AA0</b>	<b>6ES7194-2LN15-0AA0</b>
	Connecting Cable ET-Connection, 0,19m	Connecting Cable ET-Connection, 0,3m	Connecting Cable ET-Connection, 1,0M	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
<b>Mechanics/material</b>							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE	PE	PE	PE
Material property							
• Halogen-free	No	No	No	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Article number	<b>6ES7194-2MH02-0AA0</b>	<b>6ES7194-2MH03-0AA0</b>	<b>6ES7194-2MH10-0AA0</b>	<b>6ES7194-2MH20-0AA0</b>	<b>6ES7194-2MH50-0AA0</b>	<b>6ES7194-2MN10-0AA0</b>	<b>6ES7194-2MN15-0AA0</b>
	Connecting Cable ET-Connection, 0,19m	Connecting Cable ET-Connection, 0,3m	Connecting Cable ET-Connection, 1,0M	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
<b>General information</b>							
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Ambient conditions</b>							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Ambient temperature during storage/transportation</b>							
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications**

Article number	<b>6ES7194-2MH02-0AA0</b>	<b>6ES7194-2MH03-0AA0</b>	<b>6ES7194-2MH10-0AA0</b>	<b>6ES7194-2MH20-0AA0</b>	<b>6ES7194-2MH50-0AA0</b>	<b>6ES7194-2MN10-0AA0</b>	<b>6ES7194-2MN15-0AA0</b>
	Connecting Cable ET-Connection, 0,19m	Connecting Cable ET-Connection, 0,3m	Connecting Cable ET-Connection, 1,0M	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
<b>Cables</b>							
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
<b>Mechanics/material</b>							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PUR	PUR	PUR	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE	PE	PE	PE
Material property							
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#### Technical specifications

Article number	6ES7194-2LH03-0AB0	6ES7194-2LH10-0AB0	6ES7194-2LH20-0AB0	6ES7194-2LH50-0AB0	6ES7194-2LN10-0AB0	6ES7194-2LN15-0AB0
	Connecting Cable ET-Con., angled, 0,3m	Connecting Cable ET-Con., angled, 1,0M	Connecting Cable ET-Con., angled, 2,0M	Connecting Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
<b>General information</b>						
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Ambient conditions</b>						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Ambient temperature during storage/transportation</b>						
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>						
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications**

Article number	<b>6ES7194-2LH03-0AB0</b>	<b>6ES7194-2LH10-0AB0</b>	<b>6ES7194-2LH20-0AB0</b>	<b>6ES7194-2LH50-0AB0</b>	<b>6ES7194-2LN10-0AB0</b>	<b>6ES7194-2LN15-0AB0</b>
	Connecting Cable ET-Con., angled, 0,3m	Connecting Cable ET-Con., angled, 1,0M	Connecting Cable ET-Con., angled, 2,0M	Connecting Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
<b>Mechanics/material</b>						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE	PE	PE
Material property						
• Halogen-free	No	No	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes
Article number	<b>6ES7194-2MH03-0AB0</b>	<b>6ES7194-2MH10-0AB0</b>	<b>6ES7194-2MH20-0AB0</b>	<b>6ES7194-2MH50-0AB0</b>	<b>6ES7194-2MN10-0AB0</b>	<b>6ES7194-2MN15-0AB0</b>
	Connecting Cable ET-Con., angled, 0,3m	Connecting Cable ET-Con., angled, 1,0M	Connecting Cable ET-Con., angled, 2,0M	Connecting Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
<b>General information</b>						
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Ambient conditions</b>						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Ambient temperature during storage/transportation</b>						
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>						
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm

**Technical specifications**

Article number	<b>6ES7194-2MH03-0AB0</b> Connecting Cable ET-Con., angled, 0,3m	<b>6ES7194-2MH10-0AB0</b> Connecting Cable ET-Con., angled, 1,0M	<b>6ES7194-2MH20-0AB0</b> Connecting Cable ET-Con., angled, 2,0M	<b>6ES7194-2MH50-0AB0</b> Connecting Cable ET-Con., angled, 5,0M	<b>6ES7194-2MN10-0AB0</b> Bus Cable ET-Connection, angled, 10m	<b>6ES7194-2MN15-0AB0</b> Bus Cable ET-Connection, angled, 15m
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
<b>Mechanics/material</b>						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PUR	PUR	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE	PE	PE
Material property						
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes
Article number	<b>6ES7194-2LH20-0AC0</b> Connecting Cable ET-Connection, 2,0M	<b>6ES7194-2LH50-0AC0</b> Connecting Cable ET-Connection, 5,0M	<b>6ES7194-2LN10-0AC0</b> Bus Cable ET-Connection, 10m	<b>6ES7194-2LN15-0AC0</b> Bus Cable ET-Connection, 15m		
<b>General information</b>						
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable		
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded		
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67		
<b>Ambient conditions</b>						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C		
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C		
<b>Ambient temperature during storage/transportation</b>						
• min.	-40 °C	-40 °C	-40 °C	-40 °C		
• max.	80 °C	80 °C	80 °C	80 °C		
<b>Cables</b>						
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN		
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires		
Cable length	2 m	5 m	10 m	15 m		
Number of electrical cores	4	4	4	4		
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm		
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm		
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm		

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications**

Article number	<b>6ES7194-2LH20-0AC0</b> Connecting Cable ET-Connection, 2,0M	<b>6ES7194-2LH50-0AC0</b> Connecting Cable ET-Connection, 5,0M	<b>6ES7194-2LN10-0AC0</b> Bus Cable ET-Connection, 10m	<b>6ES7194-2LN15-0AC0</b> Bus Cable ET-Connection, 15m
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
<b>Mechanics/material</b>				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes
Article number	<b>6ES7194-2MH20-0AC0</b> Connecting Cable ET-Connection, 2,0M	<b>6ES7194-2MH50-0AC0</b> Connecting Cable ET-Connection, 5,0M	<b>6ES7194-2MN10-0AC0</b> Bus Cable ET-Connection, 10m	<b>6ES7194-2MN15-0AC0</b> Bus Cable ET-Connection, 15m
<b>General information</b>				
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Ambient conditions</b>				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
<b>Ambient temperature during storage/transportation</b>				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>				
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	



**Technical specifications**

Article number	<b>6ES7194-2MH20-0AC0</b>	<b>6ES7194-2MH50-0AC0</b>	<b>6ES7194-2MN10-0AC0</b>	<b>6ES7194-2MN15-0AC0</b>			
	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m			
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm			
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm			
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm			
Color of cable sheath	green	green	green	green			
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange			
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km			
<b>Mechanics/material</b>							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet			
Material of cable sheath	PUR	PUR	PUR	PUR			
Material of core insulation	PE	PE	PE	PE			
Material property							
• Halogen-free	Yes	Yes	Yes	Yes			
• Silicone-free	Yes	Yes	Yes	Yes			
Article number	<b>6ES7194-2LH02-1AA0</b>	<b>6ES7194-2LH03-1AA0</b>	<b>6ES7194-2LH10-1AA0</b>	<b>6ES7194-2LH20-1AA0</b>	<b>6ES7194-2LH50-1AA0</b>	<b>6ES7194-2LN10-1AA0</b>	<b>6ES7194-2LN15-1AA0</b>
	Power Cable M8, 0,19m	Power Cable M8, 0,3m	Power Cable M8, 1,0M	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
<b>General information</b>							
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
<b>Ambient conditions</b>							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Ambient temperature during storage/transportation</b>							
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>							
Cable designation	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications**

Article number	<b>6ES7194-2LH02-1AA0</b> Power Cable M8, 0,19m	<b>6ES7194-2LH03-1AA0</b> Power Cable M8, 0,3m	<b>6ES7194-2LH10-1AA0</b> Power Cable M8, 1,0M	<b>6ES7194-2LH20-1AA0</b> Power Cable M8, 2,0M	<b>6ES7194-2LH50-1AA0</b> Power Cable M8, 5,0M	<b>6ES7194-2LN10-1AA0</b> Power Cable M8, 10m	<b>6ES7194-2LN15-1AA0</b> Power Cable M8, 15m
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km

**Mechanics/material**

Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP	PP	PP	PP
Material property							
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Article number	<b>6ES7194-2MH02-1AA0</b> Power Cable M8 0,19m	<b>6ES7194-2MH03-1AA0</b> Power Cable M8, 0,3m	<b>6ES7194-2MH10-1AA0</b> Power Cable M8, 1,0M	<b>6ES7194-2MH20-1AA0</b> Power Cable M8, 2,0M	<b>6ES7194-2MH50-1AA0</b> Power Cable M8, 5,0M	<b>6ES7194-2MN10-1AA0</b> Power Cable M8, 10m	<b>6ES7194-2MN15-1AA0</b> Power Cable M8, 15m
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**General information**

Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply

**Ambient conditions**

Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C

**Ambient temperature during storage/transportation**

• min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C

**Cables**

Cable designation	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm

## Technical specifications

Article number	6ES7194-2MH02-1AA0	6ES7194-2MH03-1AA0	6ES7194-2MH10-1AA0	6ES7194-2MH20-1AA0	6ES7194-2MH50-1AA0	6ES7194-2MN10-1AA0	6ES7194-2MN15-1AA0
	Power Cable M8 0,19m	Power Cable M8, 0,3m	Power Cable M8, 1,0M	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km

**Mechanics/material**

Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP	PP	PP	PP
Material property							
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH03-1AB0	6ES7194-2LH10-1AB0	6ES7194-2LH20-1AB0	6ES7194-2LH50-1AB0	6ES7194-2LN10-1AB0	6ES7194-2LN15-1AB0
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m

**General information**

Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply

**Ambient conditions**

Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C

**Ambient temperature during storage/transportation**

• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C

**Cables**

Cable designation	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications**

Article number	<b>6ES7194-2LH03-1AB0</b>	<b>6ES7194-2LH10-1AB0</b>	<b>6ES7194-2LH20-1AB0</b>	<b>6ES7194-2LH50-1AB0</b>	<b>6ES7194-2LN10-1AB0</b>	<b>6ES7194-2LN15-1AB0</b>
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
<b>Mechanics/material</b>						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP	PP	PP
Material property						
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes
Article number	<b>6ES7194-2MH03-1AB0</b>	<b>6ES7194-2MH10-1AB0</b>	<b>6ES7194-2MH20-1AB0</b>	<b>6ES7194-2MH50-1AB0</b>	<b>6ES7194-2MN10-1AB0</b>	<b>6ES7194-2MN15-1AB0</b>
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
<b>General information</b>						
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
<b>Ambient conditions</b>						
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Ambient temperature during storage/transportation</b>						
• min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>						
Cable designation	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm

### Technical specifications

Article number	<b>6ES7194-2MH03-1AB0</b> Power Cable M8, angled, 0,3m	<b>6ES7194-2MH10-1AB0</b> Power Cable M8, angled, 1,0M	<b>6ES7194-2MH20-1AB0</b> Power Cable M8, angled, 2,0M	<b>6ES7194-2MH50-1AB0</b> Power Cable M8, angled, 5,0M	<b>6ES7194-2MN10-1AB0</b> Power Cable M8, angled, 10m	<b>6ES7194-2MN15-1AB0</b> Power Cable M8, angled, 15m
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
<b>Mechanics/material</b>						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP	PP	PP
Material property						
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes
Article number	<b>6ES7194-2LH20-1AC0</b> Power Cable M8, 2,0M	<b>6ES7194-2LH50-1AC0</b> Power Cable M8, 5,0M	<b>6ES7194-2LN10-1AC0</b> Power Cable M8, 10m	<b>6ES7194-2LN15-1AC0</b> Power Cable M8, 15m		
<b>General information</b>						
Product type designation	Power cable	Power cable	Power cable	Power cable		
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded		
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply		
<b>Ambient conditions</b>						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C		
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C		
<b>Ambient temperature during storage/transportation</b>						
• min.	-40 °C	-40 °C	-40 °C	-40 °C		
• max.	80 °C	80 °C	80 °C	80 °C		
<b>Cables</b>						
Cable designation	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y	4 Li9Y 0.50 mm <sup>2</sup> Y		
Cable length	2 m	5 m	10 m	15 m		
Number of electrical cores	4	4	4	4		
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm		
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm		
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm		

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications**

Article number	<b>6ES7194-2LH20-1AC0</b> Power Cable M8, 2,0M	<b>6ES7194-2LH50-1AC0</b> Power Cable M8, 5,0M	<b>6ES7194-2LN10-1AC0</b> Power Cable M8, 10m	<b>6ES7194-2LN15-1AC0</b> Power Cable M8, 15m
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km
<b>Mechanics/material</b>				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP
Material property				
• Silicone-free	Yes	Yes	Yes	Yes
Article number	<b>6ES7194-2MH20-1AC0</b> Power Cable M8, 2,0M	<b>6ES7194-2MH50-1AC0</b> Power Cable M8, 5,0M	<b>6ES7194-2MN10-1AC0</b> Power Cable M8, 10m	<b>6ES7194-2MN15-1AC0</b> Power Cable M8, 15m
<b>General information</b>				
Product type designation	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
<b>Ambient conditions</b>				
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
<b>Ambient temperature during storage/transportation</b>				
• min.	-25 °C	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>				
Cable designation	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>	LIF9Y11YFHF 4x 0.50 mm <sup>2</sup>
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm

### Technical specifications

Article number	<b>6ES7194-2MH20-1AC0</b> Power Cable M8, 2,0M	<b>6ES7194-2MH50-1AC0</b> Power Cable M8, 5,0M	<b>6ES7194-2MN10-1AC0</b> Power Cable M8, 10m	<b>6ES7194-2MN15-1AC0</b> Power Cable M8, 15m
Color of cable sheath	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km
<b>Mechanics/material</b>				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes
Article number	<b>6ES7194-2LH02-0AD0</b> Connecting Cable ET-Connection, 0,2m		<b>6ES7194-2MH02-0AD0</b> Connecting cable ET-Connection 0,2m	
<b>General information</b>				
Product type designation	Connecting cable for bus cable		Connecting cable for bus cable	
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 sockets, 4-pin, shielded		Flexible cable (4-core), preassembled at both ends with 2x M8 sockets, 4-pin, shielded	
Suitability for use	For connecting two ET CONNECTION bus cables		For connecting two ET CONNECTION bus cables	
<b>Ambient conditions</b>				
Ambient temperature during assembly, min.	-30 °C		-30 °C	
Ambient temperature during assembly, max.	80 °C		80 °C	
<b>Ambient temperature during storage/transportation</b>				
• min.	-40 °C		-40 °C	
• max.	80 °C		80 °C	
<b>Cables</b>				
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN		2Y(ST)C11Y 2x2x0.5/1.0-100-GN	
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires		Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	
Cable length	0.2 m		0.2 m	
Number of electrical cores	4		4	
Outer diameter of inner conductor	0.5 mm		0.5 mm	
Outer diameter of core insulation	1 mm		1 mm	
Outer diameter of cable sheath	5 mm		5 mm	
Permissible bending radius, single bend, min.	20 mm		20 mm	
Permissible bending radius, multiple bends, min.	40 mm		40 mm	
Bending radius for continuous bending	100 mm		100 mm	
Color of cable sheath	green		green	
Color of core insulation of data cores	white / yellow / blue / orange		white / yellow / blue / orange	
Weight per length	34 kg/km		34 kg/km	
<b>Mechanics/material</b>				
Outgoing feeder type	180° cable outlet		180° cable outlet	
Material of cable sheath	PVC		PUR	
Material of core insulation	PE		PE	
Material property				
• Halogen-free	No		Yes	
• Silicone-free	Yes		Yes	

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

**Accessories > Cables and connectors****Technical specifications**

Article number	<b>6ES7194-2AA00-0AA0</b> M8 Power Connector	<b>6ES7194-2AC00-0AA0</b> M8 Power Connector, Socket
<b>General information</b>		
Product type designation	Power connector	Power connector
Product description	M8 plug connector with high degree of protection, 4-pin, plastic version	M8 plug connector with high degree of protection, socket insert, 4-pin, plastic version
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
<b>Ambient conditions</b>		
Ambient temperature during assembly, min.	-30 °C	-30 °C
Ambient temperature during assembly, max.	85 °C	85 °C
<b>Ambient temperature during storage/transportation</b>		
• min.	-40 °C	-40 °C
• max.	85 °C	85 °C
<b>Mechanics/material</b>		
Outgoing feeder type	180° cable outlet	180° cable outlet
Material of housing	plastic	plastic
<b>Dimensions</b>		
Width	14 mm	14 mm
Depth	47 mm	47 mm

Article number	<b>6ES7194-2AB00-0AA0</b> M8 Connector ET-Connection
<b>General information</b>	
Product type designation	Connection plug
Product description	M8 plug connector with high degree of protection, 4-pin, metal version
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Ambient conditions</b>	
Ambient temperature during assembly, min.	-30 °C
Ambient temperature during assembly, max.	80 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	80 °C
<b>Mechanics/material</b>	
Outgoing feeder type	180° cable outlet
Material of housing	metal
<b>Dimensions</b>	
Width	14 mm
Depth	47 mm



**Overview**

- Labels for the identification of channels, modules and slots of ET 200AL components
- Can be used for interface modules and I/O modules

**Ordering data****Labels**

10 x 5 mm, RAL 9016;  
5 frames with 40 labels each

**Article No.**

**6ES7194-2BA00-0AA0**

## I/O systems

### SIMATIC ET 200 systems without control cabinet

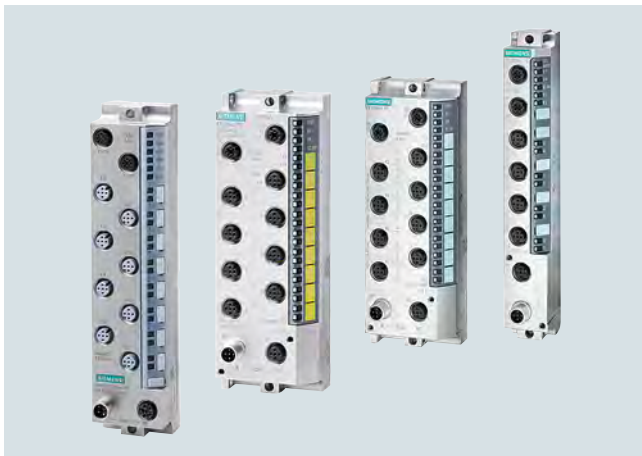
#### SIMATIC ET 200eco PN

#### Overview



SIMATIC ET 200eco PN video

[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6187715895001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6187715895001)



- PROFINET connection: 2 x M12 D-coded and automatic PROFINET address assignment
- Data transmission rate 100 Mbps
- LLDP neighborhood discovery for topological configuration
- Fast startup (boot-up within approx. 0.5 seconds)
- Channel-specific diagnostics, identification and maintenance data IM0 ... IM3
- Firmware update
- Ambient temperature range -40 °C to 60 °C
- Versions of the I/O devices with M12 L-coded power connectors:
  - DI 8
  - DI 16
  - DQ 8 (0.5 A)
  - DQ 8 (2 A)
  - DIQ 16 (0.5A/2A)
  - 8 IO-Link + DI 4
- Versions of the I/O devices with M12 A-coded power connectors:
  - 8 DI
  - 16 DI
  - 8 DQ (2 A)
  - 8 DQ (1.3 A)
  - 8 DQ (0.5 A)
  - 16 DQ (1.3 A)
  - 8 DI/DQ (1.3 A)
  - 8 F-DI/3 F-DO (2 A)
  - 8 AI (U, I, TC, RTD)
  - 8 AI (TC, RTD)
  - 4 AO (U, I)
  - 4 IO-Link
  - 4 IO-Link + 8 DI + 4 DQ (1.3 A)

- Compact block I/O for processing digital, fail-safe digital, analog and IO-Link signals for connecting to the PROFINET bus system
- Cabinet-free installation in IP65/67 degree of protection with M12 connection system
- Extremely rugged and resistant metal enclosure
- Housing type of the I/O devices with 2x M12 L-coded power connectors
  - 45 mm x 200 mm x 48 mm (W x H x D) with 8 x M12 for digital signals and IO-Link
- Housing type of the I/O devices with 2x M12 A-coded power connectors
  - 30 mm x 200 mm x 37 mm (W x H x D) with 4 x M12 for digital signals and IO-Link
  - 60 mm x 175 mm x 37 mm (W x H x D) with 8 x M12 for digital and fail-safe digital signals as well as IO-Link
  - 60 mm x 175 mm x 37 mm (W x H x D) with 4 x M12 or 8 x M12 for analog signals

**Overview**

- Digital I/O devices with 2x M12 L-coded power connectors and 45 mm width
  - 8 digital input signals with 8xM12 connection
  - 16 digital input signals with 8xM12 connection
  - 8 digital output signals 8-channel digital output module 0.5A with 8xM12 connection
  - 8 digital output signals 2A with 8xM12 connection
  - 16 digital input/output signals 0.5A/2A with 8xM12 connection



- Digital I/O devices with 2x M12 A-coded power connectors and 60 mm width
  - 8 digital input signals with 8xM12 connection
  - 16 digital input signals with 8xM12 connection
  - 8 digital output signals 1.3 A with 8xM12 connection
  - 8 digital output signals 2 A with 8xM12 connection
  - 16 digital output signals 1.3 A with 8xM12 connection
  - 8 digital input/output signals 1.3 A with 8xM12 connection



- Digital I/O devices with 2x M12 A-coded power connectors and 30 mm width
  - 8 digital input signals with 4xM12 connection
  - 8 digital output signals 0.5 A with 4xM12 connection
  - 8 digital output signals 1.3 A with 4xM12 connection

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

I/O devices &gt; Digital I/O devices

**Ordering data****Article No.****Article No.****ET 200eco PN digital input modules**

with M12 L-coded power connector

- DI 8 x 24 V DC; 8 x M12, single and dual assignment, degree of protection IP67
- DI 16 x 24 V DC, 8 x M12, dual assignment, degree of protection IP67

**6ES7141-6BG00-0BB0****6ES7141-6BH00-0BB0**

with M12 A-coded power connector

- 8 DI 24 V DC; 4 x M12, dual assignment, degree of protection IP67
- 8 DI 24 V DC; 8 x M12, degree of protection IP67
- 16 DI 24 V DC; 8 x M12, dual assignment, degree of protection IP67

**6ES7141-6BF00-0AB0****6ES7141-6BG00-0AB0****6ES7141-6BH00-0AB0****ET 200eco PN digital output modules**

with M12 L-coded power connector

- DQ 8 x 24 V DC/0.5 A; 8 x M12, single and dual assignment, degree of protection IP67
- DQ 8 x 24 V DC/2 A; 8 x M12, single and dual assignment, degree of protection IP67

**6ES7142-6BG00-0BB0****6ES7142-6BR00-0BB0**

with M12 A-coded power connector

- 8 DQ 24 V DC/0.5 A; 4 x M12, dual assignment, 1 load voltage supply DQ; degree of protection IP67
- 8 DQ 24 V DC/1.3 A; 4 x M12, dual assignment, degree of protection IP67
- 8 DQ 24 V DC/1.3 A; 8 x M12, degree of protection IP67
- 8 DQ 24 V DC/2 A; 8 x M12, degree of protection IP67
- 16 DQ 24 V DC/1.3 A; 8 x M12, dual assignment, degree of protection IP67

**6ES7142-6BF50-0AB0****6ES7142-6BF00-0AB0****6ES7142-6BG00-0AB0****6ES7142-6BR00-0AB0****6ES7142-6BH00-0AB0****ET 200eco PN digital input/output modules**

with M12 L-coded power connector

- DIQ 16 x 24 V DC/0.5 A/2 A; dual assignment, degree of protection IP67

**6ES7143-6BH00-0BB0**

with M12 A-coded power connector

- 8 DI/DQ 24 V DC/1.3 A; 8 x M12, degree of protection IP67

**6ES7147-6BG00-0AB0****Accessories**

- PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN, 10 A insulation displacement terminals
- Spare fuses for terminal block, 10 units
- DIN rail 0.5 m
- Profile screw for DIN rail, 50 units
- Sealing cap M12 for IP67 modules, 12 mm external diameter, without O-ring, 10 units
- Sealing cap M12 for IP67 modules, 15 mm external diameter, with O-ring, 10 units
- Labels 10 mm x 5 mm RAL9016, for I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each
- Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each

**6ES7148-6CB00-0AA0****6ES7194-6CA00-0AA0****6ES7194-6HB00-0AA0****6ES7194-6GA00-0AA0****6ES7194-6MA00-0AA0****3RX9802-0AA00****3RK1901-1KA00****6ES7194-2BA00-0AA0****3RT2900-1SB10****PROFINET M12 connection plug, for user assembly**

Connector for PROFINET, 4-core, shielded

**3RK1902-2DA00**

IE M12 Plug PRO connector

- 1 unit
- 8 units

**6GK1901-0DB10-6AA0****6GK1901-0DB10-6AA8**

IE FC M12 plug PRO connector, for user assembly

- 1 unit
- 8 units

**6GK1901-0DB20-6AA0****6GK1901-0DB20-6AA8****M12 connection plug for 24 V DC load power supply**

Connection socket for 24 V DC incoming supply; 4-pin, A-coded, 3 units

**6GK1907-0DC10-6AA3**

Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units

**6GK1907-0DB10-6AA3****Power M12 Plug PRO**

Connector for 24 V DC supply voltage, with installation instructions, 4-pin, L-coded, 1 unit

**6GK1906-0EA00****Power M12 Cable Connector PRO****6GK1906-0EB00**

Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit

**M12 coupler plug**Can be assembled, for connecting actuators or sensors, 5-pin, screw connection, max. 0.75 mm<sup>2</sup>, A-coded, max. 4 A

- Straight
- Angled

**3RK1902-4BA00-5AA0****3RK1902-4DA00-5AA0****M12 coupler socket****3RK1902-4CA00-4AA0**4-pin, screw connection, max. 0.75 mm<sup>2</sup>, A-coded, max. 4 A, angled**PROFINET bus cable**

Assembled on one side with 1 x M12, D-coded, 4-wire, shielded

- 3 m
- 5 m
- 10 m

**3RK1902-2HB30****3RK1902-2HB50****3RK1902-2HC10****IE connecting cable M12-90/M12-90**

Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, IP65/IP67 degree of protection, 90° cable outlet

- Length:
- 0.3 m
  - 0.5 m
  - 1.0 m
  - 1, 5 m
  - 2.0 m
  - 3.0 m
  - 5.0 m
  - 10 m
  - 15 m

**6XV1870-8GE30****6XV1870-8GE50****6XV1870-8GH10****6XV1870-8GH15****6XV1870-8GH20****6XV1870-8GH30****6XV1870-8GH50****6XV1870-8GN10****6XV1870-8GN15**

Ordering data	Article No.	Article No.	
<b>IE connecting cable M12-180/IE FC RJ45 Plug-145</b> Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 Plug, IP65/IP67 degree of protection Length: <ul style="list-style-type: none"> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>	<b>6XV1871-5TH20</b> <b>6XV1871-5TH30</b> <b>6XV1871-5TH50</b> <b>6XV1871-5TN10</b> <b>6XV1871-5TN15</b>	<b>M12 power connecting cable M12-90/M12-90</b> Flexible 4-core power connecting cable, assembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: <ul style="list-style-type: none"> <li>• 0.3 m</li> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>	<b>6XV1801-5GE30</b> <b>6XV1801-5GE50</b> <b>6XV1801-5GH10</b> <b>6XV1801-5GH15</b> <b>6XV1801-5GH20</b> <b>6XV1801-5GH30</b> <b>6XV1801-5GH50</b> <b>6XV1801-5GN10</b> <b>6XV1801-5GN15</b>
<b>IE robust connecting cable M12-180/M12-180</b> Pre-assembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), IP69 degree of protection Length: <ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> </ul>	<b>6XV1881-5AH10</b> <b>6XV1881-5AH20</b> <b>6XV1881-5AH30</b> <b>6XV1881-5AH50</b>	<b>M12 power connecting cable M12-90/M12-90</b> Flexible 4-wire power connecting cable, pre-assembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length: <ul style="list-style-type: none"> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>	<b>6XV1801-6GE50</b> <b>6XV1801-6GH10</b> <b>6XV1801-6GH15</b> <b>6XV1801-6GH20</b> <b>6XV1801-6GH30</b> <b>6XV1801-6GH50</b> <b>6XV1801-6GN10</b> <b>6XV1801-6GN15</b>
<b>M12 Y cable</b> For double connection of I/O by means of single cable to ET 200, 5-pin	<b>6ES7194-6KA00-0XA0</b>		
<b>Control line</b> Assembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm <sup>2</sup> , A-coded, max. 4 A, PUR casing, black <ul style="list-style-type: none"> <li>• 1.5 m</li> <li>• 5 m</li> <li>• 10 m</li> </ul> Assembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm <sup>2</sup> , A-coded, max. 4 A, PUR casing, black	<b>3RK1902-4HB15-5AA0</b> <b>3RK1902-4HB50-5AA0</b> <b>3RK1902-4HC01-5AA0</b> <b>3RK1902-4PB15-3AA0</b>		
<b>IO-Link connecting cables</b> Between IO-Link master and reader, on both sides with M12 plug, 4-pin <ul style="list-style-type: none"> <li>• 5 m</li> <li>• 10 m</li> </ul>	<b>6GT2891-4MH50</b> <b>6GT2891-4MN10</b>		
<b>Energy Cable 4 x 1.5</b> Power line, suitable for cable carriers, with 4 copper cores (1.5 mm <sup>2</sup> ) for connecting to M12 plug-in connectors; sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m	<b>6XV1801-2B</b>		
		<b>M12 power connecting cable M12-180/M12-180</b> Flexible 4-core power connecting cable, assembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length: <ul style="list-style-type: none"> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>	<b>6XV1801-6DE50</b> <b>6XV1801-6DH10</b> <b>6XV1801-6DH15</b> <b>6XV1801-6DH20</b> <b>6XV1801-6DH30</b> <b>6XV1801-6DH50</b> <b>6XV1801-6DN10</b> <b>6XV1801-6DN15</b>
		<b>M12 robust power connecting cable M12-180/M12-180</b> Flexible 4-wire power connecting cable, assembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: <ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> </ul>	<b>6XV1801-5AH10</b> <b>6XV1801-5AH20</b> <b>6XV1801-5AH30</b> <b>6XV1801-5AH50</b>

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

I/O devices &gt; Digital I/O devices

**Technical specifications**

Article number	<b>6ES7141-6BG00-0BB0</b> ET 200eco PN, DI 8x24VDC, M12-L	<b>6ES7141-6BH00-0BB0</b> ET 200eco PN, DI 16x24VDC, M12-L
<b>General information</b>		
<b>Product function</b>		
• Isochronous mode	Yes	Yes
• Prioritized startup	Yes	Yes
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V16 or higher with HSP 0299	STEP 7 V16 or higher with HSP 0299
• PROFINET from GSD version/ GSD revision	GSDML V2.3.x	GSDML V2.3.x
<b>Operating mode</b>		
• DI	Yes	Yes
• Counter	No	No
• MSI	Yes	Yes
<b>Supply voltage</b>		
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Input current</b>		
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	85 mA; without load 12 A; Maximum value	90 mA; without load 12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value	12 A; Maximum value
<b>Encoder supply</b>		
<b>24 V encoder supply</b>		
• Short-circuit protection	Yes; per channel, electronic	Yes; Group-by-group for 2 channels, electronic
• Output current, max.	100 mA; per output	100 mA; per output
<b>Digital inputs</b>		
Number of digital inputs	8	16
Digital inputs, parameterizable	Yes	Yes
Source/sink input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
<b>Number of simultaneously controllable inputs</b>		
<b>all mounting positions</b>		
- up to 60 °C, max.	8	16
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal "1", typ.	2.4 mA	2.4 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>		
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
<b>Cable length</b>		
• unshielded, max.	30 m	30 m
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>Interfaces</b>		
Number of PROFINET interfaces	1	1
<b>1. Interface</b>		
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
<b>Interface types</b>		
• M12 port	Yes; 2x M12, 4-pin, D-coded	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2	2
• integrated switch	Yes	Yes

#### Technical specifications

Article number	<b>6ES7141-6BG00-0BB0</b>	<b>6ES7141-6BH00-0BB0</b>
	ET 200eco PN, DI 8x24VDC, M12-L	ET 200eco PN, DI 16x24VDC, M12-L
<b>Protocols</b>		
• PROFINET IO Device	Yes	Yes
• Open IE communication	Yes	Yes
<b>Interface types</b>		
<b>M12 port</b>		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
<b>Protocols</b>		
Supports protocol for PROFINET IO	Yes	Yes
<b>PROFINET IO Device</b>		
<b>Services</b>		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes	Yes
<b>Redundancy mode</b>		
<b>Media redundancy</b>		
- MRP	Yes	Yes
<b>Open IE communication</b>		
• TCP/IP	Yes	Yes
• SNMP	Yes	Yes
• LLDP	Yes	Yes
<b>Isochronous mode</b>		
Equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnoses</b>		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- parameterizable	Yes	Yes
• Wire-break	Yes; DI, input current < 0.3 mA, per channel	Yes; DI, input current < 0.3 mA, per channel
• Short-circuit encoder supply	Yes; Per channel group	Yes; Per channel group
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• Connection display LINK TX/RX	Yes; green LED, only link	Yes; green LED, only link
<b>Potential separation</b>		
between the load voltages	Yes	Yes
between Ethernet and electronics	Yes	Yes
<b>Potential separation channels</b>		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-40 °C	-40 °C
• max.	60 °C	60 °C

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

I/O devices &gt; Digital I/O devices

**Technical specifications**

Article number	<b>6ES7141-6BG00-0BB0</b> ET 200eco PN, DI 8x24VDC, M12-L	<b>6ES7141-6BH00-0BB0</b> ET 200eco PN, DI 16x24VDC, M12-L	
<b>Altitude during operation relating to sea level</b> • Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	
<b>Connection method</b>			
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded	M12, 5-pin, A-coded	
Design of electrical connection for supply voltage	M12, 4-pin, L-coded	M12, 4-pin, L-coded	
<b>Dimensions</b>			
Width	45 mm	45 mm	
Height	200 mm	200 mm	
Depth	48 mm	48 mm	
<b>Weights</b>			
Weight, approx.	780 g	780 g	
Article number	<b>6ES7141-6BF00-0AB0</b> ET200eco PN, 8DI, DC24V, 4xM12	<b>6ES7141-6BG00-0AB0</b> ET200eco PN, 8DI, DC24V, 8xM12	<b>6ES7141-6BH00-0AB0</b> ET200eco PN, 16DI, DC24V, 8xM12
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
<b>Input current</b>			
Current consumption, typ. from supply voltage 1L+, max.	100 mA 4 A	100 mA 4 A	100 mA 4 A
<b>Encoder supply</b>			
<b>24 V encoder supply</b> • Short-circuit protection • Output current, max.	Yes; Electronic 100 mA; per output	Yes; Electronic 100 mA; per output	Yes; Electronic 100 mA; per output
<b>Digital inputs</b>			
Number of digital inputs • in groups of	8 2	8 1	16 2
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b> - up to 60 °C, max.	8	8	16
<b>Input voltage</b> • Rated value (DC) • for signal "0" • for signal "1"	24 V -3 to +5V +11 to +30V	24 V -3 to +5V +11 to +30V	24 V -3 to +5V +11 to +30V
<b>Input current</b> • for signal "1", typ.	7 mA	7 mA	7 mA
<b>Cable length</b> • unshielded, max.	30 m	30 m	30 m
<b>Encoder</b>			
<b>Connectable encoders</b> • 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA
<b>Interfaces</b>			
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1	1
<b>1. Interface</b>			
<b>Interface types</b> • M12 port • integrated switch	Yes Yes	Yes Yes	Yes Yes



**Technical specifications**

Article number	<b>6ES7141-6BF00-0AB0</b>	<b>6ES7141-6BG00-0AB0</b>	<b>6ES7141-6BH00-0AB0</b>
	ET200eco PN, 8DI, DC24V, 4xM12	ET200eco PN, 8DI, DC24V, 8xM12	ET200eco PN, 16DI, DC24V, 8xM12
<b>Interface types</b>			
<b>M12 port</b>			
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
<b>Protocols</b>			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	No
PROFIsafe	No	No	No
<b>PROFINET IO Device</b>			
<b>Services</b>			
- IRT with the option "high flexibility"	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
<b>Redundancy mode</b>			
<b>Media redundancy</b>			
- MRP	Yes	Yes	Yes
<b>Open IE communication</b>			
• TCP/IP	No	No	No
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
• ping	Yes	Yes	Yes
• ARP	Yes	Yes	Yes
<b>Interrupts/diagnostics/ status information</b>			
Diagnostics function	Yes	Yes	Yes
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnoses</b>			
• Diagnostic information readable	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED
• Wire-break in signal transmitter cable	Yes	Yes	Yes
• Short-circuit encoder supply	Yes; Per channel group	Yes; Per channel group	Yes; Per channel group
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
<b>Potential separation</b>			
between the load voltages	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No
between Ethernet and electronics	Yes	Yes	Yes
<b>Potential separation channels</b>			
• between the channels	No	No	No
<b>Connection method</b>			
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
<b>Dimensions</b>			
Width	30 mm	60 mm	60 mm
Height	200 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm
<b>Weights</b>			
Weight, approx.	550 g	910 g	910 g

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SIMATIC ET 200eco PN

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Article number	<b>6ES7142-6BG00-0BB0</b> ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	<b>6ES7142-6BR00-0BB0</b> ET 200eco PN, DQ 8x24VDC/2A, M12-L
<b>General information</b>		
<b>Product function</b>		
• Isochronous mode	Yes	Yes
• Prioritized startup	Yes	Yes
<b>Engineering with</b>		
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V16 or higher with HSP 0299	STEP 7 V16 or higher with HSP 0299
• PROFINET from GSD version/ GSD revision	GSDML V2.3.x	GSDML V2.3.x
<b>Operating mode</b>		
• DQ	Yes	Yes
• MSO	Yes	Yes
<b>Supply voltage</b>		
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction
<b>Input current</b>		
Current consumption (rated value)	65 mA; without load	65 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value	12 A; Maximum value
<b>Digital outputs</b>		
Number of digital outputs	8	8
Current-sourcing	Yes	Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	Typ. 2L+ (-52 V)	Type -14 V
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	0.5 A	2 A
• with inductive load, max.	0.5 A	2 A
• on lamp load, max.	5 W	10 W
<b>Load resistance range</b>		
• lower limit	48 Ω	12 Ω
• upper limit	4 kΩ	4 kΩ
<b>Output current</b>		
• for signal "1" rated value	0.5 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.2 mA
<b>Parallel switching of two outputs</b>		
• for uprating	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
<b>Total current of the outputs</b>		
• Current per module, max.	4 A	8 A
<b>Cable length</b>		
• unshielded, max.	30 m	30 m

#### Technical specifications

Article number	<b>6ES7142-6BG00-0BB0</b> ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	<b>6ES7142-6BR00-0BB0</b> ET 200eco PN, DQ 8x24VDC/2A, M12-L
<b>Interfaces</b>		
Number of PROFINET interfaces	1	1
<b>1. Interface</b>		
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
<b>Interface types</b>		
• M12 port	Yes; 2x M12, 4-pin, D-coded	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2	2
• integrated switch	Yes	Yes
<b>Protocols</b>		
• PROFINET IO Device	Yes	Yes
• Open IE communication	Yes	Yes
<b>Interface types</b>		
<b>M12 port</b>		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
<b>Protocols</b>		
Supports protocol for PROFINET IO	Yes	Yes
<b>PROFINET IO Device</b>		
<b>Services</b>		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
<b>Redundancy mode</b>		
<b>Media redundancy</b>		
- MRP	Yes	Yes
<b>Open IE communication</b>		
• TCP/IP	Yes	Yes
• SNMP	Yes	Yes
• LLDP	Yes	Yes
<b>Isochronous mode</b>		
Equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
<b>Interrupts/diagnostics/status information</b>		
Substitute values connectable	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnoses</b>		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- parameterizable	Yes	Yes
• Wire-break	Yes	Yes
• Short-circuit	Yes; Outputs to M; channel by channel	Yes; Outputs to M; channel by channel
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link	Yes; green LED, only link

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Article number	<b>6ES7142-6BG00-0BB0</b>		<b>6ES7142-6BR00-0BB0</b>		
	ET 200eco PN, DQ 8x24VDC/0,5A, M12-L		ET 200eco PN, DQ 8x24VDC/2A, M12-L		
<b>Potential separation</b>					
between the load voltages	Yes		Yes		
between Ethernet and electronics	Yes		Yes		
<b>Potential separation channels</b>					
• between the channels	No		No		
• between the channels and the power supply of the electronics	Yes		Yes		
<b>Ambient conditions</b>					
<b>Ambient temperature during operation</b>					
• min.	-40 °C		-40 °C		
• max.	60 °C		60 °C		
<b>Altitude during operation relating to sea level</b>					
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions		Up to max. 5 000 m, at installation height > 2 000 m additional restrictions		
<b>Connection method</b>					
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded		M12, 5-pin, A-coded		
Design of electrical connection for supply voltage	M12, 4-pin, L-coded		M12, 4-pin, L-coded		
<b>Dimensions</b>					
Width	45 mm		45 mm		
Height	200 mm		200 mm		
Depth	48 mm		48 mm		
<b>Weights</b>					
Weight, approx.	780 g		780 g		
Article number	<b>6ES7142-6BF50-0AB0</b>	<b>6ES7142-6BF00-0AB0</b>	<b>6ES7142-6BG00-0AB0</b>	<b>6ES7142-6BR00-0AB0</b>	<b>6ES7142-6BH00-0AB0</b>
	ET200eco PN, 8DO, DC24V/0,5A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 8xM12	ET200eco PN, 8 DO, DC24V/2A, 8xM12	ET200eco PN, 16DO DC24V/1,3A, 8xM12
<b>Supply voltage</b>					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
<b>Load voltage 1L+</b>					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
<b>Load voltage 2L+</b>					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
<b>Input current</b>					
Current consumption, typ.	100 mA	100 mA	100 mA	100 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A	4 A	4 A	4 A
from load voltage 1L+ (unswitched voltage)	100 mA	4 A	4 A	4 A	4 A
from load voltage 2L+, max.	4 A	4 A	4 A	4 A	4 A
<b>Digital outputs</b>					
Number of digital outputs	8	8	8	8	16
• in groups of	8	4	4	4	8
Short-circuit protection	Yes	Yes	Yes	Yes	Yes
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>					
• on lamp load, max.	5 W	5 W	5 W	10 W	5 W
<b>Output current</b>					
• for signal "1" rated value	0.5 A	1.3 A; Maximum	1.3 A; Maximum	2 A	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA

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Article number	6ES7142-6BF50-0AB0	6ES7142-6BF00-0AB0	6ES7142-6BG00-0AB0	6ES7142-6BR00-0AB0	6ES7142-6BH00-0AB0
	ET200eco PN, 8DO, DC24V/0,5A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 8xM12	ET200eco PN, 8 DO, DC24V/2A, 8xM12	ET200eco PN, 16DO DC24V/1,3A, 8xM12
<b>Parallel switching of two outputs</b>					
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
<b>Switching frequency</b>					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz	1 Hz	1 Hz
<b>Total current of the outputs (per group)</b>					
<b>all mounting positions</b>					
- up to 55 °C, max.		3.9 A			
- up to 60 °C, max.	4 A	2.6 A	3.9 A	3.9 A	3.9 A
<b>Cable length</b>					
• unshielded, max.	30 m	30 m	30 m	30 m	30 m
<b>Interfaces</b>					
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1	1	1	1
<b>1. Interface</b>					
<b>Interface types</b>					
• M12 port		Yes			
• integrated switch	Yes	Yes	Yes	Yes	Yes
<b>Interface types</b>					
<b>M12 port</b>					
• Autonegotiation	Yes	Yes	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s
<b>Protocols</b>					
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes	Yes
PROFINET CBA	No	No	No	No	No
PROFIsafe	No	No	No	No	No
<b>PROFINET IO Device</b>					
<b>Services</b>					
- IRT with the option "high flexibility"	Yes	Yes	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes	Yes	Yes
<b>Redundancy mode</b>					
<b>Media redundancy</b>					
- MRP	Yes	Yes	Yes	Yes	Yes
<b>Open IE communication</b>					
• TCP/IP	No	No	No	No	No
• SNMP	Yes	Yes	Yes	Yes	Yes
• DCP	Yes	Yes	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes	Yes	Yes
• ping	Yes	Yes	Yes	Yes	Yes
• ARP	Yes	Yes	Yes	Yes	Yes
<b>Interrupts/diagnostics/ status information</b>					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
<b>Diagnoses</b>					
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED
• Wire-break in actuator cable	Yes	Yes	Yes	Yes	Yes
• Short-circuit	Yes	Yes	Yes	Yes	Yes
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED

## I/O systems

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SIMATIC ET 200eco PN

I/O devices > Digital I/O devices

### Technical specifications

Article number	6ES7142-6BF50-0AB0	6ES7142-6BF00-0AB0	6ES7142-6BG00-0AB0	6ES7142-6BR00-0AB0	6ES7142-6BH00-0AB0
	ET200eco PN, 8DO, DC24V/0,5A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 8xM12	ET200eco PN, 8 DO, DC24V/2A, 8xM12	ET200eco PN, 16DO DC24V/1,3A, 8xM12
<b>Potential separation</b>					
between the load voltages	Yes	Yes	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No	No	No
between Ethernet and electronics	Yes	Yes	Yes	Yes	Yes
<b>Potential separation channels</b>					
• between the channels	No	No	No	No	No
<b>Standards, approvals, certificates</b>					
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes	Yes	Yes
<b>Highest safety class achievable for safety-related tripping of standard modules</b>					
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2	SILCL 2	SILCL 2
<b>Connection method</b>					
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
<b>Dimensions</b>					
Width	30 mm	30 mm	60 mm	60 mm	60 mm
Height	200 mm	200 mm	175 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm	49 mm	49 mm
<b>Weights</b>					
Weight, approx.	550 g	550 g	910 g	910 g	910 g
Article number	<b>6ES7143-6BH00-0BB0</b>			Article number	<b>6ES7143-6BH00-0BB0</b>
	ET 200eco PN, DIQ 16x24VDC/2A, M12-L				ET 200eco PN, DIQ 16x24VDC/2A, M12-L
<b>General information</b>				<b>Input current</b>	
<b>Product function</b>				Current consumption (rated value)	90 mA; without load
• Isochronous mode	No			from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
• Prioritized startup	Yes			from load voltage 2L+, max.	12 A; Maximum value
<b>Engineering with</b>				<b>Encoder supply</b>	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP 0299			<b>24 V encoder supply</b>	
• PROFINET from GSD version/GSD revision	GSDML V2.3.x			• Short-circuit protection	Yes; Group-by-group for 2 channels, electronic
<b>Operating mode</b>				• Output current, max.	100 mA; per output
• DI	Yes			<b>Digital inputs</b>	
• Counter	No			Number of digital inputs	16; Parameterizable as DIQ
• DQ	Yes			• in groups of	8
• MSI	Yes			Digital inputs, parameterizable	Yes
• MSO	Yes			Source/sink input	P-reading
<b>Supply voltage</b>				Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Load voltage 1L+</b>				<b>Number of simultaneously controllable inputs</b>	
• Rated value (DC)	24 V			<b>all mounting positions</b>	
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up			- up to 60 °C, max.	16
<b>Load voltage 2L+</b>				<b>Input voltage</b>	
• Rated value (DC)	24 V			• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction			• for signal "0"	-3 to +5V
				• for signal "1"	+11 to +30V
				<b>Input current</b>	
				• for signal "1", typ.	2.4 mA

### Technical specifications

Article number	<b>6ES7143-6BH00-0BB0</b> ET 200eco PN, DIQ 16x24VDC/2A, M12-L
<b>Input delay (for rated value of input voltage) for standard inputs</b> - parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
<b>Cable length</b> • unshielded, max.	30 m
<b>Digital outputs</b> Number of digital outputs • in groups of Current-sourcing Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input	16; Parameterizable as DIQ 8; 2 load groups for 8 outputs each Yes Yes; per channel, electronic 0.5 A: Type 1L+ (-70 V) / 2 A: Type (-18 V) Yes
<b>Switching capacity of the outputs</b> • with resistive load, max. • with inductive load, max. • on lamp load, max.	0.5 A / 2 A 0.5 A / 2 A 0.5 A: 5 W / 2 A 10 W
<b>Load resistance range</b> • lower limit • upper limit	0.5 A: 48 ohms / 2 A: 12 ohms 4 kΩ
<b>Output voltage</b> • for signal "1", min.	1L+ (-0.8 V) / 2L+ (-0.8 V)
<b>Output current</b> • for signal "1" rated value • for signal "0" residual current, max.	0.5 A / 2 A 0.1 mA
<b>Parallel switching of two outputs</b> • for uprating • for redundant control of a load	No Yes
<b>Switching frequency</b> • with resistive load, max. • with inductive load, max. • on lamp load, max.	0.5 A: 100 Hz / 2 A: 40 Hz 0.5 Hz 1 Hz
<b>Total current of the outputs</b> • Current per group, max. • Current per module, max.	1L+: 2 A / 2L+: 6 A 8 A
<b>Cable length</b> • unshielded, max.	30 m
<b>Encoder</b> <b>Connectable encoders</b> • 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes 1.5 mA
<b>Interfaces</b> Number of PROFINET interfaces	1
<b>1. Interface</b> Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
<b>Interface types</b> • M12 port • Number of ports • integrated switch	Yes; 2x M12, 4-pin, D-coded 2 Yes
<b>Protocols</b> • PROFINET IO Device • Open IE communication	Yes Yes

Article number	<b>6ES7143-6BH00-0BB0</b> ET 200eco PN, DIQ 16x24VDC/2A, M12-L
<b>Interface types</b> <b>M12 port</b> • Autonegotiation • Autocrossing • Transmission rate, max.	Yes Yes 100 Mbit/s
<b>Protocols</b> Supports protocol for PROFINET IO	Yes
<b>PROFINET IO Device</b> <b>Services</b> - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.	Yes; 250 μs to 4 ms in 125 μs frame Yes Yes 2
<b>Redundancy mode</b> <b>Media redundancy</b> - MRP	Yes
<b>Open IE communication</b> • TCP/IP • SNMP • LLDP	Yes Yes Yes
<b>Interrupts/diagnostics/status information</b> Substitute values connectable	Yes
<b>Alarms</b> • Diagnostic alarm • Maintenance interrupt • Hardware interrupt	Yes; Parameterizable Yes; Parameterizable Yes; Parameterizable
<b>Diagnoses</b> • Diagnostic information readable • Monitoring the supply voltage - parameterizable • Wire-break  • Short-circuit  • Short-circuit encoder supply	Yes Yes Yes Yes; DI, input current < 0.3 mA, per channel Yes; Outputs to M and P; channel by channel Yes; Per channel group
<b>Diagnostics indication LED</b> • RUN LED • ERROR LED • MAINT LED • Channel status display • for channel diagnostics • For load voltage monitoring • Connection display LINK TX/RX	Yes; green LED Yes; red LED Yes; Yellow LED Yes; green LED Yes; red LED Yes; green LED Yes; green LED, only link
<b>Potential separation</b> between the load voltages between Ethernet and electronics	Yes Yes
<b>Potential separation channels</b> • between the channels • between the channels, in groups of 8 • between the channels and the power supply of the electronics	Yes 8 8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

I/O devices &gt; Digital I/O devices

**Technical specifications**

Article number	<b>6ES7143-6BH00-0BB0</b> ET 200eco PN, DIQ 16x24VDC/2A, M12-L
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C
• max.	60 °C
<b>Altitude during operation relating to sea level</b>	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
<b>Connection method</b>	
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
<b>Dimensions</b>	
Width	45 mm
Height	200 mm
Depth	48 mm
<b>Weights</b>	
Weight, approx.	780 g
Article number	<b>6ES7147-6BG00-0AB0</b> ET200eco PN, 8 DIO, DC24V/1,3A, 8xM12
<b>Supply voltage</b>	
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Input current</b>	
Current consumption, typ.	100 mA
from supply voltage 1L+, max.	4 A
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
<b>Encoder supply</b>	
<b>24 V encoder supply</b>	
• Short-circuit protection	Yes; Electronic
• Output current, max.	100 mA; per output
<b>Digital inputs</b>	
Number of digital inputs	8
• in groups of	4
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Number of simultaneously controllable inputs</b>	
<b>all mounting positions</b>	
- up to 60 °C, max.	8
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "1", typ.	7 mA
<b>Cable length</b>	
• unshielded, max.	30 m

Article number	<b>6ES7147-6BG00-0AB0</b> ET200eco PN, 8 DIO, DC24V/1,3A, 8xM12
<b>Digital outputs</b>	
Number of digital outputs	8
• in groups of	4
Short-circuit protection	Yes; Electronic
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Output current</b>	
• for signal "1" rated value	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA
<b>Parallel switching of two outputs</b>	
• for uprating	No
• for redundant control of a load	Yes
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
<b>Total current of the outputs (per group)</b>	
<b>all mounting positions</b>	
- up to 60 °C, max.	3.9 A
<b>Cable length</b>	
• unshielded, max.	30 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Interfaces</b>	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
<b>1. Interface</b>	
<b>Interface types</b>	
• M12 port	Yes
• integrated switch	Yes
<b>Interface types</b>	
<b>M12 port</b>	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
<b>Protocols</b>	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	No
<b>PROFINET IO Device</b>	
<b>Services</b>	
- IRT with the option "high flexibility"	Yes
- Prioritized startup	Yes
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes

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**Technical specifications**

Article number	<b>6ES7147-6BG00-0AB0</b> ET200eco PN, 8 DIO, DC24V/1,3A, 8xM12
<b>Open IE communication</b>	
• TCP/IP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; green "ON" LED
• Wire-break in actuator cable	Yes
• Wire-break in signal transmitter cable	Yes
• Short-circuit	Yes
• Short-circuit encoder supply	Yes
• Group error	Yes; Red/yellow "SF/MT" LED
<b>Potential separation</b>	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
<b>Potential separation channels</b>	
• between the channels	No

Article number	<b>6ES7147-6BG00-0AB0</b> ET200eco PN, 8 DIO, DC24V/1,3A, 8xM12
<b>Standards, approvals, certificates</b>	
Suitable for safety-related tripping of standard modules	No
<b>Connection method</b>	
Design of electrical connection	4/5-pin M12 circular connectors
<b>Dimensions</b>	
Width	60 mm
Height	175 mm
Depth	49 mm
<b>Weights</b>	
Weight, approx.	910 g

**I/O systems**

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

I/O devices > Analog I/O devices

**Overview**

Analog I/O devices with 2x M12 A-coded power connectors and 60 mm width

- 8 analog input signals U/I/RTD/TC with 8xM12 connection
- 8 analog input signals RTD/TC with 8xM12 connection
- 4 analog output signals U/I with 4xM12 connection

**Ordering data****ET 200eco PN analog input modules**

- 8 AI 4 U/I + 4 RTD/TC; 8 x M12, degree of protection IP67
- 8 AI RTD/TC; 8 x M12, degree of protection IP67

**Article No.**

6ES7144-6KD00-0AB0

6ES7144-6KD50-0AB0

**ET 200eco PN analog output modules**

- 4 AQ U/I; 4 x M12, degree of protection IP67

6ES7145-6HD00-0AB0

**Accessories**

- PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN, 10 A insulation displacement terminals
- Spare fuses for terminal block, 10 units
- Mounting rail 0.5 m
- Profile screw for mounting rail, 50 units
- Sealing cap M12 for IP67 modules, 12 mm external diameter, without O-ring, 10 units
- Sealing cap M12 for IP67 modules, 15 mm external diameter, with O-ring, 10 units
- Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each

6ES7148-6CB00-0AA0

6ES7194-6CA00-0AA0

6ES7194-6HB00-0AA0

6ES7194-6GA00-0AA0

6ES7194-6MA00-0AA0

3RX9802-0AA00

3RK1901-1KA00

3RT2900-1SB10

**PROFINET M12 connection plug, for user assembly**

Connector for PROFINET, 4-core, shielded

IE M12 Plug PRO connector

- 1 unit
- 8 units

IE FC M12 plug PRO connector, for user assembly

- 1 unit
- 8 units

3RK1902-2DA00

6GK1901-0DB10-6AA0

6GK1901-0DB10-6AA8

6GK1901-0DB20-6AA0

6GK1901-0DB20-6AA8

**Article No.****M12 connection plug for 24 V DC load power supply**

Connection socket for 24 V DC incoming supply; 4-pin, A-coded, 3 units

6GK1907-0DC10-6AA3

Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units

6GK1907-0DB10-6AA3

**M12 coupler plug**

Can be assembled, for connecting actuators or sensors, 5-pin, screw connection, max. 0.75 mm<sup>2</sup>, A-coded, max. 4 A

- Straight
- Angled

3RK1902-4BA00-5AA0

3RK1902-4DA00-5AA0

**M12 coupler socket**

4-pin, screw connection, max. 0.75 mm<sup>2</sup>, A-coded, max. 4 A, angled

3RK1902-4CA00-4AA0

**PROFINET bus cable**

Assembled on one side with 1 x M12, D-coded, 4-wire, shielded

- 3 m
- 5 m
- 10 m

3RK1902-2HB30

3RK1902-2HB50

3RK1902-2HC10

**IE Connecting Cable M12-90/M12-90**

Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, IP65/IP67 degree of protection, 90° cable outlet  
Length:

- 0.3 m
- 0.5 m
- 1.0 m
- 1, 5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1870-8GE30

6XV1870-8GE50

6XV1870-8GH10

6XV1870-8GH15

6XV1870-8GH20

6XV1870-8GH30

6XV1870-8GH50

6XV1870-8GN10

6XV1870-8GN15

Ordering data	Article No.	Article No.
<b>IE Connecting Cable M12-180/IE FC RJ45 Plug-145</b> Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 Plug, IP65/IP67 degree of protection Length: <ul style="list-style-type: none"> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>	<b>6XV1871-5TH20</b> <b>6XV1871-5TH30</b> <b>6XV1871-5TH50</b> <b>6XV1871-5TN10</b> <b>6XV1871-5TN15</b>	<b>M12 Power Connecting Cable M12-90/M12-90</b> Flexible 4-core power connecting cable, assembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: <ul style="list-style-type: none"> <li>• 0.3 m</li> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>
<b>IE Robust Connecting Cable M12-180/M12-180</b> Pre-assembled IE FC TP Robust Food Cable 2 x 2 (PROFINET type C) with two 4-pin M12 connectors (D-coded), IP69 degree of protection Length: <ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> </ul>	<b>6XV1881-5AH10</b> <b>6XV1881-5AH20</b> <b>6XV1881-5AH30</b> <b>6XV1881-5AH50</b>	<b>M12 Robust Power Connecting Cable M12-180/M12-180</b> Flexible 4-core power connecting cable, assembled with A-coded, 5-pin M12 connector and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: <ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> </ul>
		<b>6XV1801-5GE30</b> <b>6XV1801-5GE50</b> <b>6XV1801-5GH10</b> <b>6XV1801-5GH15</b> <b>6XV1801-5GH20</b> <b>6XV1801-5GH30</b> <b>6XV1801-5GH50</b> <b>6XV1801-5GN10</b> <b>6XV1801-5GN15</b>
		<b>6XV1801-5AH10</b> <b>6XV1801-5AH20</b> <b>6XV1801-5AH30</b> <b>6XV1801-5AH50</b>

## Technical specifications

Article number	6ES7144-6KD00-0AB0	6ES7144-6KD50-0AB0
	ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	ET200eco PN, 8AI RTD/TC 8xM12
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes; against destruction
<b>Input current</b>		
Current consumption, typ.	110 mA	110 mA
<b>Encoder supply</b>		
Number of outputs	4	
<b>24 V encoder supply</b>		
• Short-circuit protection	Yes; Electronic at 1.4 A	
• Output current, max.	1 A	
<b>Analog inputs</b>		
Number of analog inputs	8	8
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
• -80 mV to +80 mV	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
• -20 mA to +20 mA	Yes	
• 4 mA to 20 mA	Yes	

**I/O systems**

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices &gt; Analog I/O devices

**Technical specifications**

Article number	<b>6ES7144-6KD00-0AB0</b>	<b>6ES7144-6KD50-0AB0</b>
	ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	ET200eco PN, 8AI RTD/TC 8xM12
<b>Input ranges (rated values), thermocouples</b>		
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
<b>Input ranges (rated values), resistance thermometer</b>		
• Ni 100	Yes	Yes
• Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Ni 200	Yes	Yes
• Ni 500	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes
<b>Input ranges (rated values), resistors</b>		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
• 0 to 3000 ohms	Yes	Yes
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- parameterizable	Yes	Yes
- internal temperature compensation	Yes	Yes
- external temperature compensation with Pt100		Yes
- external temperature compensation with compensations socket	Yes	Yes
- dynamic reference temperature value		Yes
- for definable comparison point temperature		Yes
<b>Cable length</b>		
• shielded, max.	30 m	30 m
<b>Analog value generation for the inputs</b>		
Analog value display	SIMATIC S7 format	SIMATIC S7 format
Measurement principle	integrating	integrating
<b>Integration and conversion time/ resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	2/16.67/20/100 ms	2/16.67/20/100 ms
• Interference voltage suppression for interference frequency f1 in Hz	500 / 60 / 50 / 10 Hz	500 / 60 / 50 / 10 Hz
<b>Smoothing of measured values</b>		
• parameterizable	Yes	Yes
<b>Encoder</b>		
Number of connectable encoders, max.	8	8

**Technical specifications**

Article number	<b>6ES7144-6KD00-0AB0</b> ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	<b>6ES7144-6KD50-0AB0</b> ET200eco PN, 8AI RTD/TC 8xM12
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	
• for current measurement as 2-wire transducer	Yes	
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with two-wire connection	Yes	Yes
• for resistance measurement with three-wire connection	Yes	Yes
• for resistance measurement with four-wire connection	Yes	Yes
<b>Errors/accuracies</b>		
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	U: 0.0035%/°C; I: 0.006%/°C; RTD: 0.0005%/°C; TC: 0.0035%/°C	RTD: 0.0005%/°C; TC: 0.0035%/°C
Crosstalk between the inputs, min.	85 dB	-85 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %	0.008 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	46 dB	46 dB
• Common mode interference, min.	70 dB	70 dB
<b>Interfaces</b>		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
<b>1. Interface</b>		
<b>Interface types</b>		
• M12 port	Yes	
• integrated switch	Yes	Yes
<b>Interface types</b>		
<b>M12 port</b>		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
<b>Protocols</b>		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	No
<b>PROFINET IO Device</b>		
<b>Services</b>		
- IRT with the option "high flexibility"	Yes	
- Prioritized startup	Yes	Yes
<b>Redundancy mode</b>		
<b>Media redundancy</b>		
- MRP	Yes	Yes
<b>Open IE communication</b>		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN**I/O devices > Analog I/O devices****Technical specifications**

Article number	<b>6ES7144-6KD00-0AB0</b>	<b>6ES7144-6KD50-0AB0</b>	
	ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	ET200eco PN, 8AI RTD/TC 8xM12	
<b>Interrupts/diagnostics/status information</b>			
Diagnostics function	Yes	Yes	
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	
<b>Diagnoses</b>			
• Diagnostic information readable	Yes	Yes	
• Monitoring the supply voltage	Yes; green "ON" LED	Yes; green "ON" LED	
• Short-circuit encoder supply	Yes; per module		
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	
• Overflow/underflow	Yes	Yes	
<b>Potential separation</b>			
between the load voltages	Yes	Yes	
between load voltage and all other switching components	No	No	
between Ethernet and electronics	Yes	Yes	
<b>Potential separation channels</b>			
• between the channels	No	No	
<b>Standards, approvals, certificates</b>			
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262	Yes; Declaration of Conformity, see online support entry 109757262	
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E	Yes; Based on AMS 2750 E	
<b>Connection method</b>			
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	
<b>Dimensions</b>			
Width	60 mm	60 mm	
Height	175 mm	175 mm	
Depth	49 mm	49 mm	
<b>Weights</b>			
Weight, approx.	930 g	930 g	
<hr/>			
Article number	<b>6ES7145-6HD00-0AB0</b>	Article number	<b>6ES7145-6HD00-0AB0</b>
	ET200eco PN, 4AO U/I 4xM12		ET200eco PN, 4AO U/I 4xM12
<b>Supply voltage</b>		<b>Output ranges, current</b>	
Rated value (DC)	24 V	• 0 to 20 mA	Yes
Reverse polarity protection	Yes	• -20 mA to +20 mA	Yes
<b>Input current</b>		• 4 mA to 20 mA	Yes
Current consumption, typ.	280 mA	<b>Connection of actuators</b>	
<b>Actuator supply</b>		• for voltage output two-wire connection	Yes
Number of outputs	4	• for current output two-wire connection	Yes
Short-circuit protection	Yes; Electronic at 1.4 A	<b>Load impedance (in rated range of output)</b>	
<b>Output current</b>		• with voltage outputs, min.	1 kΩ
• Rated value	1 A; Maximum	• with voltage outputs, capacitive load, max.	1 μF
<b>Analog outputs</b>		• with current outputs, max.	600 Ω
Number of analog outputs	4	• with current outputs, inductive load, max.	1 mH
Voltage output, short-circuit protection	Yes	<b>Cable length</b>	
Voltage output, short-circuit current, max.	30 mA	• shielded, max.	30 m
Current output, no-load voltage, max.	20 V	<b>Analog value generation for the outputs</b>	
<b>Output ranges, voltage</b>		Analog value display	SIMATIC S7 format
• 0 to 10 V	Yes	Conversion principle	Resistor network
• 1 V to 5 V	Yes		
• -10 V to +10 V	Yes		

## Technical specifications

Article number	<b>6ES7145-6HD00-0AB0</b> ET200eco PN, 4AO U/I 4xM12
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Conversion time (per channel)	1 ms
<b>Settling time</b>	
• for resistive load	2 ms
• for capacitive load	1.8 ms
• for inductive load	2 ms
<b>Errors/accuracies</b>	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	U: ±0.6 mVrms; I: ±0.4 nArms
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	U: 0.001%/°C; I: 0.0025%/°C
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.008 %
<b>Interfaces</b>	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
<b>1. Interface</b>	
<b>Interface types</b>	
• M12 port	Yes
• integrated switch	Yes
<b>Interface types</b>	
<b>M12 port</b>	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
<b>Protocols</b>	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	No
<b>PROFINET IO Device</b>	
<b>Services</b>	
- IRT with the option "high flexibility"	Yes
- Prioritized startup	Yes

Article number	<b>6ES7145-6HD00-0AB0</b> ET200eco PN, 4AO U/I 4xM12
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
- MRP	Yes
<b>Open IE communication</b>	
• TCP/IP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; green "ON" LED
• Wire-break	Yes; Channel-by-channel with current output
• Short-circuit	Yes; Channel-by-channel with voltage output
• Group error	Yes; Red/yellow "SF/MT" LED
<b>Potential separation</b>	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
<b>Potential separation channels</b>	
• between the channels	No
<b>Connection method</b>	
Design of electrical connection	4/5-pin M12 circular connectors
<b>Dimensions</b>	
Width	60 mm
Height	175 mm
Depth	49 mm
<b>Weights</b>	
Weight, approx.	930 g

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

I/O devices > Fail-safe I/O device

### Overview



The ET 200eco PN fail-safe I/O device expands the ET 200eco PN system family. It is incorporated seamlessly into the Safety Integrated concept like with ET 200MP / ET 200SP and ET200pro. It also supports safety-related communication via PROFINET. The functional safety is certified in accordance with IEC 61508. It is designed for safety-related use up to SIL 3 according to IEC 62061 and PL e according to ISO 13849.

The following fail-safe I/O device with 2x M12 A-coded power connectors and 60 mm width is available:

- F-DI 8x24V /F-DQ 3x24V 2A with 8xM12 connection

### Ordering data

#### ET 200eco PN fail-safe digital input/output modules

- 8 F-DI 24 V DC/  
3 F-DQ 24 V DC/2 A;  
PROFINET, certified up to SIL 3  
(IEC 61508), PL e (ISO 13849);  
4 x M12/3 x M12,  
degree of protection IP65/67

### Article No.

6ES7146-6FF00-0AB0

#### Accessories

- PD voltage distributor, 24 V DC;  
1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN,  
10 A insulation displacement  
terminals
- Spare fuses for terminal block,  
10 units
- DIN rail 0.5 m
- Profile screw for DIN rail, 50 units
- Sealing cap M12 for  
IP67 modules, 12 mm external  
diameter, without O-ring, 10 units
- Sealing cap M12 for  
IP67 modules, 15 mm external  
diameter, with O-ring, 10 units
- Labels 10 mm x 7 mm yellow, for  
I/O devices with 2x M12 A-coded  
power connectors; 17 frames with  
48 labels each

6ES7148-6CB00-0AA0

6ES7194-6CA00-0AA0

6ES7194-6HB00-0AA0

6ES7194-6GA00-0AA0

6ES7194-6MA00-0AA0

3RX9802-0AA00

3RK1901-1KA00

6ES7194-6HA00-0AA0

#### PROFINET M12 connection plug, for user assembly

Connector for PROFINET, 4-core,  
shielded

IE M12 Plug PRO connector

- 1 unit
- 8 units

IE FC M12 plug PRO connector,  
for user assembly

- 1 unit
- 8 units

3RK1902-2DA00

6GK1901-0DB10-6AA0

6GK1901-0DB10-6AA8

6GK1901-0DB20-6AA0

6GK1901-0DB20-6AA8

#### M12 connection plug for 24 V DC load power supply

Connection socket for  
24 V DC incoming supply;  
4-pin, A-coded, 3 units

Connector for loop-through of  
24 V DC;  
4-pin, A-coded, 3 units

6GK1907-0DC10-6AA3

6GK1907-0DB10-6AA3

### Article No.

#### M12 coupler plug

Can be assembled, for connecting  
actuators or sensors, 5-pin,  
screw connection, max. 0.75 mm<sup>2</sup>,  
A-coded, max. 4 A

- Straight
- Angled

3RK1902-4BA00-5AA0  
3RK1902-4DA00-5AA0

#### M12 coupler socket

4-pin, screw connection,  
max. 0.75 mm<sup>2</sup>, A-coded,  
max. 4 A, angled

3RK1902-4CA00-4AA0

#### PROFINET bus cable

Assembled on one side with  
1 x M12, D-coded, 4-wire, shielded

- 3 m
- 5 m
- 10 m

3RK1902-2HB30  
3RK1902-2HB50  
3RK1902-2HC10

#### IE connecting cable M12-90/M12-90

Pre-assembled IE FC TP trailing  
cable GP 2 x 2 (PROFINET type C)  
with two 4-pin M12 plugs (D-coded)  
up to 85 m, IP65/IP67 degree of  
protection, 90° cable outlet  
Length:

- 0.3 m
- 0.5 m
- 1.0 m
- 1, 5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1870-8GE30  
6XV1870-8GE50  
6XV1870-8GH10  
6XV1870-8GH15  
6XV1870-8GH20  
6XV1870-8GH30  
6XV1870-8GH50  
6XV1870-8GN10  
6XV1870-8GN15

#### IE connecting cable M12-180/IE FC RJ45 Plug-145

Pre-assembled IE FC TP trailing  
cable GP 2 x 2 (PROFINET type C)  
with M12 plug (D-coded) and  
IE FC RJ45 Plug,  
IP65/IP67 degree of protection  
Length:

- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1871-5TH20  
6XV1871-5TH30  
6XV1871-5TH50  
6XV1871-5TN10  
6XV1871-5TN15



Ordering data	Article No.	Article No.
<b>IE robust connecting cable M12-180/M12-180</b> Pre-assembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), IP69 degree of protection Length: <ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> </ul>	<b>6XV1881-5AH10</b> <b>6XV1881-5AH20</b> <b>6XV1881-5AH30</b> <b>6XV1881-5AH50</b>	<b>IO-Link connecting cables</b> Between IO-Link master and reader, on both sides with M12 plug, 4-pin <ul style="list-style-type: none"> <li>• 5 m</li> <li>• 10 m</li> </ul>
<b>M12 Y cable</b> For connection of single-channel sensors (1001 evaluation), 5-pin For joint connection of an F-DQ and an F-DI channel by means of an 8-pin M12 socket	<b>6ES7194-6KB00-0XA0</b>  <b>6ES7194-6KC00-0XA0</b>	<b>M12 power connecting cable M12-90/M12-90</b> Flexible 4-core power connecting cable, assembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: <ul style="list-style-type: none"> <li>• 0.3 m</li> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>
<b>E-coding plug for fail-safe ET 200 distributed I/O, IP65/67</b>	<b>6ES7194-6KB00-0AA0</b>	<b>6GT2891-4MH50</b> <b>6GT2891-4MN10</b>
<b>E-coding plug (metal) for fail-safe ET 200 distributed I/O, IP65/67</b>	<b>6ES7194-6KB01-0AA0</b>	<b>6XV1801-5GE30</b> <b>6XV1801-5GE50</b> <b>6XV1801-5GH10</b> <b>6XV1801-5GH15</b> <b>6XV1801-5GH20</b> <b>6XV1801-5GH30</b> <b>6XV1801-5GH50</b> <b>6XV1801-5GN10</b> <b>6XV1801-5GN15</b>
<b>Control line</b> Assembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm <sup>2</sup> , A-coded, max. 4 A, PUR casing, black <ul style="list-style-type: none"> <li>• 1.5 m</li> <li>• 5 m</li> <li>• 10 m</li> </ul> Assembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm <sup>2</sup> , A-coded, max. 4 A, PUR casing, black	<b>3RK1902-4HB15-5AA0</b> <b>3RK1902-4HB50-5AA0</b> <b>3RK1902-4HC01-5AA0</b>  <b>3RK1902-4PB15-3AA0</b>	<b>M12 robust power connecting cable M12-180/M12-180</b> Flexible 4-wire power connecting cable, assembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: <ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> </ul>

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## Technical specifications

Article number	<b>6ES7146-6FF00-0AB0</b> ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A	Article number	<b>6ES7146-6FF00-0AB0</b> ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
<b>Engineering with</b> • STEP 7 TIA Portal configurable/ integrated from version	V15 with HSP 204	<b>Encoder supply</b>	
<b>Operating mode</b> • DI • DQ	Yes Yes	<b>24 V encoder supply</b> • Short-circuit protection • Output current, max.	Yes; Electronic 300 mA; per output
<b>Supply voltage</b> Rated value (DC) Reverse polarity protection	24 V Yes	<b>Digital inputs</b> Number of digital inputs Digital inputs, parameterizable Input characteristic curve in accordance with IEC 61131, type 1	8; 8 (one-channel); 4 (two-channel) Yes Yes
<b>Load voltage 1L+</b> • Rated value (DC) • Reverse polarity protection	24 V Yes	<b>Number of simultaneously controllable inputs</b> <b>all mounting positions</b> - up to 60 °C, max.	8
<b>Load voltage 2L+</b> • Rated value (DC) • Reverse polarity protection	24 V Yes	<b>Input voltage</b> • Rated value (DC) • for signal "0" • for signal "1"	24 V -30 V DC to +5 V DC 15 V DC to 30 V DC
<b>Input current</b> Current consumption, typ. from supply voltage 1L+, max. from load voltage 2L+, max.	200 mA 4 A 4 A	<b>Input delay (for rated value of input voltage) for standard inputs</b> - parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms

**I/O systems**

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

**I/O devices > Fail-safe I/O device****Technical specifications**

Article number	<b>6ES7146-6FF00-0AB0</b> ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
<b>Cable length</b> • unshielded, max.	30 m
<b>Digital outputs</b>	
Number of digital outputs	3
• in groups of	3
Short-circuit protection	Yes; Electronic
Limitation of inductive shutdown voltage to	PM-switching: Typ. -26 V to (-48 V)
Controlling a digital input	No
<b>Switching capacity of the outputs</b> • on lamp load, max.	10 W
<b>Output current</b> • for signal "1" rated value • for signal "0" residual current, max.	2 A 0.5 mA
<b>Parallel switching of two outputs</b> • for uprating • for redundant control of a load	No No
<b>Switching frequency</b> • with resistive load, max. • with inductive load, max. • on lamp load, max.	30 Hz 0.1 Hz 10 Hz
<b>Total current of the outputs (per group)</b> <b>all mounting positions</b> - up to 60 °C, max.	3.9 A
<b>Cable length</b> • unshielded, max.	30 m
<b>Encoder</b>	
<b>Connectable encoders</b> • 2-wire sensor - permissible quiescent current (2-wire sensor), max.	No 0.5 mA
<b>Interfaces</b>	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
<b>1. Interface</b>	
<b>Interface types</b> • M12 port • integrated switch	Yes Yes
<b>Interface types</b>	
<b>M12 port</b> • Autonegotiation • Autocrossing • Transmission rate, max.	Yes Yes 100 Mbit/s
<b>Protocols</b>	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	Yes
<b>PROFINET IO Device</b>	
<b>Services</b> - IRT with the option "high flexibility" - Prioritized startup	No; module will participate within an IRT topology No

Article number	<b>6ES7146-6FF00-0AB0</b> ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
<b>Open IE communication</b> • TCP/IP • SNMP • DCP • LLDP • ping • ARP	No Yes Yes Yes Yes Yes
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b> • Diagnostic alarm	Yes
<b>Diagnoses</b> • Diagnostic information readable • Monitoring the supply voltage • Wire-break in actuator cable • Wire-break in signal transmitter cable • Short-circuit • Short-circuit encoder supply • Group error	Yes Yes; green "ON" LED Yes Yes Yes Yes Yes; Red/yellow "SF/MT" LED
<b>Potential separation</b> between the load voltages between load voltage and all other switching components between Ethernet and electronics	Yes No Yes
<b>Potential separation channels</b> • between the channels	No
<b>Standards, approvals, certificates</b> Suitable for safety-related tripping of standard modules	No
<b>Highest safety class achievable in safety mode</b> • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508  • SILCL according to IEC 62061	PLe SIL 2 (single-channel), SIL 3 (two-channel) SIL 3
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b> • min. • max.	-25 °C 60 °C
<b>Connection method</b> Design of electrical connection	Connection plug
<b>Dimensions</b> Width Height Depth	60 mm 175 mm 49 mm
<b>Weights</b> Weight, approx.	940 g

**Overview**

IO-Link master with 2x M12 L-coded power connectors and 45 mm width

- IO-Link communications modules for connecting up to 8 IO-Link devices
- IO-Link master with 4x Class A port and 4x Class B port as well as additional 4 digital inputs
- The IO-Link specifications V1.0 and V1.1 are supported



IO-Link master with 2x M12 A-coded power connectors and 60 mm width

- IO-Link communications modules for connecting up to 4 IO-Link devices
- IO-Link master with 4x Class A port and additional 8 digital inputs and 4 digital outputs
- The IO-Link specification V1.0 is supported



IO-Link master with 2x M12 A-coded power connectors and 30 mm width

- IO-Link communications modules for connecting up to 4 IO-Link devices
- IO-Link master with 4x Class B port
- The IO-Link specifications V1.0 and V1.1 are supported

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN**I/O devices > IO-Link master****Ordering data****ET 200eco PN IO-Link master**

- 4 IO-L + 8 DI + 4 DO, 24 V DC/1.3 A; 8 x M12, degree of protection IP67, enclosure width 60 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and Class A port as well as 8 digital inputs and 4 digital outputs
- 4 IO-L; 4 x M12, degree of protection IP67, enclosure width 30 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and Class B port
- 8 IO-L + 4 DI 24 V DC; 8 x M12, degree of protection IP67, enclosure width 45 mm; for connecting up to 8 IO-Link devices according to IO-Link specification V1.0 and V1.1, 4x Class A port and 4 x Class B port, as well as 4 additional digital inputs

**Accessories**

- PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN, 10 A insulation displacement terminals
- Spare fuses for terminal block, 10 units
- Mounting rail 0.5 m
- Profile screw for mounting rail, 50 units
- Sealing cap M12 for IP67 modules, 12 mm external diameter, without O-ring, 10 units
- Sealing cap M12 for IP67 modules, 15 mm external diameter, with O-ring, 10 units
- Labels 10 mm x 5 mm RAL9016, for I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each
- Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each

**PROFINET M12 connection plug, for user assembly**

Connector for PROFINET, 4-core, shielded

IE M12 plug PRO connector

- 1 unit
- 8 units

IE FC M12 plug PRO connector, for user assembly

- 1 unit
- 8 units

**M12 connection plug for 24 V DC load current supply**

Connection socket for 24 V DC incoming supply; 4-pin, A-coded, 3 units

Connector for loop-through of 24 V DC; 4-pole, A-coded, 3 units

**Article No.****6ES7148-6JA00-0AB0****6ES7148-6JD00-0AB0****6ES7148-6JG00-0BB0****6ES7148-6CB00-0AA0****6ES7194-6CA00-0AA0****6ES7194-6HB00-0AA0****6ES7194-6GA00-0AA0****6ES7194-6MA00-0AA0****3RX9802-0AA00****3RK1901-1KA00****6ES7194-2BA00-0AA0****3RT2900-1SB10****3RK1902-2DA00****6GK1901-0DB10-6AA0****6GK1901-0DB10-6AA8****6GK1901-0DB20-6AA0****6GK1901-0DB20-6AA8****6GK1907-0DC10-6AA3****6GK1907-0DB10-6AA3****Article No.****M12 circular connector**Can be assembled, for connecting actuators or sensors, 5-pin, screw connection, max. 0.75 mm<sup>2</sup>, A-coded, max. 4 A

- Straight
- Angled

**3RK1902-4BA00-5AA0**  
**3RK1902-4DA00-5AA0****M12 coupling socket**4-pole, screw connection, max. 0.75 mm<sup>2</sup>, A-coded, max. 4 A, angled**3RK1902-4CA00-4AA0****PROFINET bus cable**

Pre-assembled on one side with 1 x M12, D-coded, 4-wire, shielded

- 3 m
- 5 m
- 10 m

**3RK1902-2HB30**  
**3RK1902-2HB50**  
**3RK1902-2HC10****IE connecting cable M12-90/M12-90**

Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pole M12 plugs (D-coded) up to 85 m, IP65/IP67 degree of protection, 90° cable outlet

Length:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

**6XV1870-8GE30**  
**6XV1870-8GE50**  
**6XV1870-8GH10**  
**6XV1870-8GH15**  
**6XV1870-8GH20**  
**6XV1870-8GH30**  
**6XV1870-8GH50**  
**6XV1870-8GN10**  
**6XV1870-8GN15****IE connecting cable M12-180/IE FC RJ45 plug-145**

Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, IP65/IP67 degree of protection

Length:

- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

**6XV1871-5TH20**  
**6XV1871-5TH30**  
**6XV1871-5TH50**  
**6XV1871-5TN10**  
**6XV1871-5TN15****IE Robust connecting cable M12-180/M12-180**

Pre-assembled IE FC TP Robust Food Cable 2 x 2 (PROFINET type C) with two 4-pole M12 connectors (D-coded), IP69 degree of protection

Length:

- 1.0 m
- 2.0 m
- 3.0 m
- 5.0 m

**6XV1881-5AH10**  
**6XV1881-5AH20**  
**6XV1881-5AH30**  
**6XV1881-5AH50****M12 Y cable**

for double connection of I/O by means of single cable to ET 200, 5-pin

**6ES7194-6KA00-0XA0**

Ordering data	Article No.	Article No.
<b>Control line</b> Pre-assembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm <sup>2</sup> , A-coded, max. 4 A, PUR casing, black <ul style="list-style-type: none"> <li>• 1.5 m</li> <li>• 5 m</li> <li>• 10 m</li> </ul> Pre-assembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm <sup>2</sup> , A-coded, max. 4 A, PUR casing, black	<b>3RK1902-4HB15-5AA0</b> <b>3RK1902-4HB50-5AA0</b> <b>3RK1902-4HC01-5AA0</b> <b>3RK1902-4PB15-3AA0</b>	<b>M12 Power connecting cable M12-180/M12-180</b> Flexible 4-core power connecting cable, pre-assembled with L-coded, 4-pole M12 plug and L-coded, 4-pole M12 socket to supply terminal devices with 24 V DC Length: <ul style="list-style-type: none"> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>
<b>IO-Link connecting cables</b> Between IO-Link master and reader, on both sides with M12 plug, 4-pole <ul style="list-style-type: none"> <li>• 5 m</li> <li>• 10 m</li> </ul>	<b>6GT2891-4MH50</b> <b>6GT2891-4MN10</b>	<b>M12 Power connecting cable M12-90/M12-90</b> Flexible 4-core power connecting cable, pre-assembled with L-coded, 4-pole M12 plug and L-coded, 4-pole M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length: <ul style="list-style-type: none"> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>
<b>Energy Cable 4 x 1.5</b> Energy cable, suitable for cable carriers, with 4 copper cores (1.5 mm <sup>2</sup> ) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	<b>6XV1801-2B</b>	<b>M12 Robust Power connecting cable M12-180/M12-180</b> Flexible 4-core power connecting cable, pre-assembled with A-coded, 5-pin M12 connector and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: <ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> </ul>
<b>M12 Power connecting cable M12-90/M12-90</b> Flexible 4-core power connecting cable, pre-assembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: <ul style="list-style-type: none"> <li>• 0.3 m</li> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul>	<b>6XV1801-5GE30</b> <b>6XV1801-5GE50</b> <b>6XV1801-5GH10</b> <b>6XV1801-5GH15</b> <b>6XV1801-5GH20</b> <b>6XV1801-5GH30</b> <b>6XV1801-5GH50</b> <b>6XV1801-5GN10</b> <b>6XV1801-5GN15</b>	<b>6XV1801-6DE50</b> <b>6XV1801-6DH10</b> <b>6XV1801-6DH15</b> <b>6XV1801-6DH20</b> <b>6XV1801-6DH30</b> <b>6XV1801-6DH50</b> <b>6XV1801-6DN10</b> <b>6XV1801-6DN15</b>  <b>6XV1801-6GE50</b> <b>6XV1801-6GH10</b> <b>6XV1801-6GH15</b> <b>6XV1801-6GH20</b> <b>6XV1801-6GH30</b> <b>6XV1801-6GH50</b> <b>6XV1801-6GN10</b> <b>6XV1801-6GN10</b>
		<b>Power M12 plug PRO</b> Connector for 24 V DC supply voltage, with installation instructions, 4-pole, L-coded, 1 unit
		<b>Power M12 cable connector PRO</b> Connection socket for 24 V DC supply voltage, 4-pole, L-coded, with installation instructions, 1 unit
		<b>6GK1906-0EA00</b>  <b>6GK1906-0EB00</b>

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN**I/O devices > IO-Link master****Technical specifications**

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200eco PN: IO-Link master	<b>6ES7148-6JD00-0AB0</b> ET 200eco PN: IO-Link master	<b>6ES7148-6JG00-0BB0</b> ET 200eco PN, CM 8x IO-Link, M12-L
<b>General information</b>			
<b>Product function</b>			
• Prioritized startup			Yes
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/ integrated from version			STEP 7 V16 or higher with HSP 0326
• PROFINET from GSD version/ GSD revision			GSDML V2.3.x
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	
Reverse polarity protection	Yes	Yes	
<b>Load voltage 1L+</b>			
• Rated value (DC)			24 V
• Reverse polarity protection			Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Load voltage 2L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes; against destruction; load increas- ing	Yes; against destruction
<b>Input current</b>			
Current consumption (rated value)			70 mA; without load
Current consumption, typ.	200 mA	100 mA	
from supply voltage 1L+, max.	4 A	4 A	
from load voltage 1L+ (unswitched voltage)			12 A; Maximum value
from load voltage 2L+, max.	4 A	4 A	12 A; Maximum value
<b>Encoder supply</b>			
Number of outputs	6	4	8
<b>24 V encoder supply</b>			
• Short-circuit protection	Yes	Yes; per channel, electronic	Yes; per channel, electronic
• Output current, max.	200 mA; 100 mA per output to X5-X6	500 mA; Per channel	0.5 A; Per channel
<b>Hardware configuration</b>			
<b>Submodules</b>			
• Number of configurable submodules, max.			9
<b>Digital inputs</b>			
Number of digital inputs	8		4
Source/sink input			P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes		Yes
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b> - up to 60 °C, max.	8		4
<b>Input voltage</b>			
• Type of input voltage			DC
• Rated value (DC)	24 V		24 V
• for signal "0"	-3 to +5V		-3 to +5V
• for signal "1"	+11 to +30V		+11 to +30V
<b>Input current</b>			
• for signal "0", max. (permissible quiescent current)	1.5 mA		
• for signal "1", typ.	7 mA		2.5 mA
<b>Cable length</b>			
• unshielded, max.	30 m		30 m
<b>Digital outputs</b>			
Number of digital outputs	4		
Short-circuit protection	Yes; Electronic		
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V		
Controlling a digital input	Yes		

#### Technical specifications

Article number	6ES7148-6JA00-0AB0	6ES7148-6JD00-0AB0	6ES7148-6JG00-0BB0
	ET 200eco PN: IO-Link master	ET 200eco PN: IO-Link master	ET 200eco PN, CM 8x IO-Link, M12-L
<b>Switching capacity of the outputs</b>			
• on lamp load, max.	5 W		
<b>Output current</b>			
• for signal "1" rated value	1.3 A; Maximum		
• for signal "0" residual current, max.	1.5 mA		
<b>Parallel switching of two outputs</b>			
• for uprating	No		
• for redundant control of a load	Yes		
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz		
• with inductive load, max.	0.5 Hz		
• on lamp load, max.	1 Hz		
<b>Total current of the outputs (per group)</b>			
<b>all mounting positions</b>			
- up to 60 °C, max.	3.9 A		
<b>Cable length</b>			
• unshielded, max.	30 m		
<b>IO-Link</b>			
Number of ports	4	4	8
• of which simultaneously controllable	4	4	8
IO-Link protocol 1.0	Yes	Yes	Yes
IO-Link protocol 1.1	No	Yes	Yes
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.			2 ms
Size of process data, input per port	32 byte	32 byte	33 byte
Size of process data, input per module	32 byte	128 bytes + 4 bytes PQI	264 byte
Size of process data, output per port	32 byte	32 byte	32 byte
Size of process data, output per module	32 byte	128 byte	256 byte
Memory size for device parameter		2 kbyte; for each port	2 kbyte; for each port
Master backup		Possible with function block IO_LINK_MASTER	Possible with function block IO_LINK_MASTER
Configuration without S7-PCT		Possible; autostart/manual function	Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m	20 m
<b>Operating modes</b>			
• IO-Link	Yes	Yes	Yes
• DI	Yes	Yes	Yes
• DQ	Yes	Yes; max. 100 mA	Yes; max. 100 mA
<b>Connection of IO-Link devices</b>			
• Port type A	Yes	Yes; via 3-core cable	Yes; via 3-core cable
• Port type B		Yes; Additional device supply: max. 2 A per port, max. 4 A per module	Yes; additional device supply: max. 2 A per port, max. 6 A per module
• via three-wire connection	Yes		
<b>Interfaces</b>			
Transmission procedure	100BASE-TX	100BASE-TX	
Number of PROFINET interfaces	1	1	1
<b>1. Interface</b>			
Interface type			PROFINET with 100 Mbit/s full duplex (100BASE-TX)
<b>Interface types</b>			
• M12 port	Yes	Yes	Yes; 2x M12, 4-pin, D-coded
• Number of ports			2
• integrated switch	Yes	Yes	Yes
<b>Protocols</b>			
• PROFINET IO Device			Yes
• Open IE communication			Yes

**I/O systems**

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

**I/O devices > IO-Link master****Technical specifications**

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200eco PN: IO-Link master	<b>6ES7148-6JD00-0AB0</b> ET 200eco PN: IO-Link master	<b>6ES7148-6JG00-0BB0</b> ET 200eco PN, CM 8x IO-Link, M12-L
<b>Interface types</b>			
<b>M12 port</b>			
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
<b>Protocols</b>			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	
PROFIsafe	No	No	
<b>PROFINET IO Device</b>			
<b>Services</b>			
- IRT			Yes; 250 µs to 4 ms in 125 µs frame
- IRT with the option "high flexibility"	Yes	Yes	
- Prioritized startup			Yes
- Shared device			Yes
- Number of IO Controllers with shared device, max.			2
<b>Redundancy mode</b>			
<b>Media redundancy</b>			
- MRP	Yes	Yes	Yes
<b>Open IE communication</b>			
• TCP/IP	No	No	Yes
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	
• LLDP	Yes	Yes	Yes
• ping	Yes	Yes	
• ARP	Yes	Yes	
<b>Interrupts/diagnostics/status information</b>			
Diagnostics function	Yes	Yes	
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes; Parameterizable
• Maintenance interrupt			Yes; Parameterizable
<b>Diagnoses</b>			
• Diagnostic information readable	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; green "ON" LED	Yes; green "ON" LED	Yes
- parameterizable			Yes
• Wire-break			Yes
• Wire-break in actuator cable	Yes		
• Wire-break in signal transmitter cable	Yes		
• Short-circuit	Yes	Yes; Device supply to M	
• Short-circuit encoder supply	Yes		Yes; Per channel
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	
<b>Diagnostics indication LED</b>			
• RUN LED			Yes; green LED
• ERROR LED			Yes; red LED
• MAINT LED			Yes; Yellow LED
• Channel status display			Yes; green LED
• for channel diagnostics			Yes; red LED
• For load voltage monitoring			Yes; green LED
• Connection display LINK TX/RX			Yes; green LED, only link
<b>Potential separation</b>			
between the load voltages	Yes	Yes	Yes
between load voltage and all other switching components	No	No	
between Ethernet and electronics	Yes	Yes	Yes

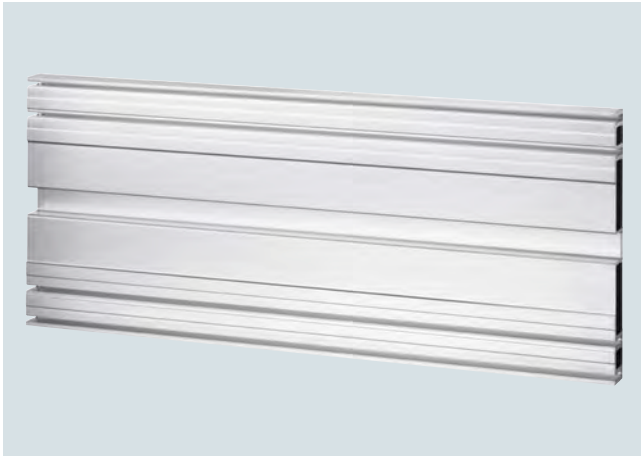


**Technical specifications**

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200eco PN: IO-Link master	<b>6ES7148-6JD00-0AB0</b> ET 200eco PN: IO-Link master	<b>6ES7148-6JG00-0BB0</b> ET 200eco PN, CM 8x IO-Link, M12-L
<b>Potential separation channels</b> • between the channels • between the channels and the power supply of the electronics	No		No No
<b>Standards, approvals, certificates</b> Suitable for safety-related tripping of standard modules		No	
<b>Ambient conditions</b> <b>Ambient temperature during operation</b> • min. • max.			-40 °C 60 °C
<b>Altitude during operation relating to sea level</b> • Ambient air temperature-barometric pressure-altitude			Up to max. 5 000 m, at installation height > 2 000 m additional restrictions, see manual for details
<b>Connection method</b> Design of electrical connection for the inputs and outputs Design of electrical connection for supply voltage		3/5-pin M12 round connectors	M12, 5-pin, A-coded M12, 4-pin, L-coded
<b>Dimensions</b> Width Height Depth	60 mm 175 mm 49 mm	30 mm 200 mm 49 mm	45 mm 200 mm 48 mm
<b>Weights</b> Weight, approx.	910 g	550 g	780 g

**I/O systems**

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200eco PN

**Accessories > Mounting rail, labels****Overview Mounting rail**

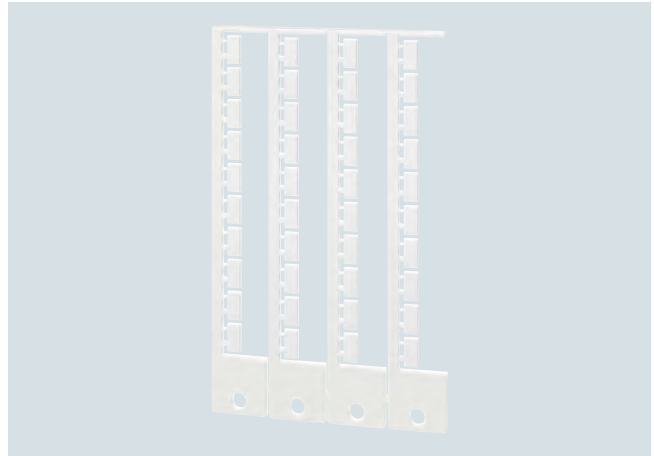
- Aluminum mounting rail for installation of SIMATIC ET 200eco PN
- Securing the I/O devices via two profile screws
- Length of mounting rail 0.5 m

**Ordering data****Article No.****Mounting rail for ET 200eco PN****6ES7194-6GA00-0AA0**

Length 0.5 m

**Profile screw for mounting rail****6ES7194-6MA00-0AA0**

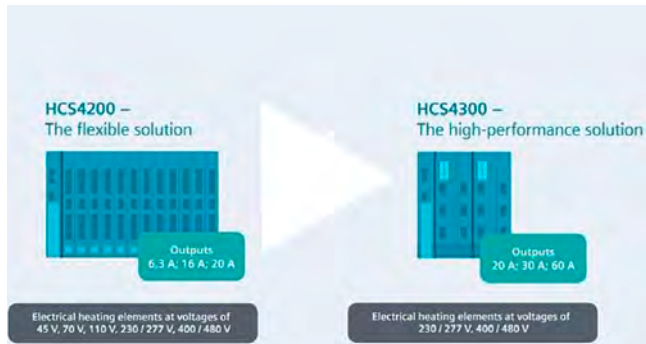
For fixing the I/O devices on the mounting rail; 50 units

**Overview Labels**

- Labels for channel and device labeling of the ET 200eco PN components

**Ordering data****Article No.****Labels 10 mm x 5 mm RAL9016****6ES7194-2BA00-0AA0**For I/O devices with  
2x M12 L-coded power connectors;  
5 frames with 40 labels each**Labels 10 x 7 mm Ti-grey****3RT2900-1SB10**For I/O devices with  
2x M12 A-coded power connectors;  
5 frames with 40 labels each**Labels 10 mm x 7 mm yellow****6ES7194-6HA00-0AA0**For I/O devices with  
2x M12 A-coded power connectors;  
17 frames with 48 labels each**10**

### Overview



SIMATIC ET 200SP HCS video  
[https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c\\_default/index.html?videoId=6149950597001](https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6149950597001)



SIPLUS HCS family

### **SIPLUS HCS heating control systems: Industrial heating processes – maximum precision and efficiency**

In manufacturing processes where temperature plays a crucial role, deviations of just a few degrees can cause enormous quality problems. To avoid this and to minimize rejection rates, high-precision and reliable, individual control of the electrical heating elements is essential.

Nearly all industrially manufactured products undergo heat treatment. Even small deviations in the heating process can result in enormous negative effects on product quality.

To increase the quality and quantity of a heat-treated product, it is important to be able to focus the energy required with the highest level of spatial and temporal precision. The SIPLUS HCS ensures utmost precision in the control of electric heating elements such as infrared heaters.

Two heating control systems are available:

- HCS4200 – The flexible choice
- HCS4300 – The powerful solution

The SIPLUS HCS family of heating control systems saves time, costs and resources when it comes to configuring, commissioning, operation and maintenance.

This is achieved by:

- Simple integration into existing automation systems such as SIMATIC and SIMOTION
- Lower wiring costs and user-friendly engineering
- Intelligent diagnostics options for swift fault detection
- Service-friendly design thanks to ready-to-use function and data blocks
- Reduced volume in the control cabinet with space savings of up to 50%

For more information, see <http://www.siemens.com/hcs>

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4200 heating control system

#### Overview



HCS4200 family

The SIPLUS HCS4200 heating control system controls and switches heat emitters and other resistive loads in industrial environments in a range of voltages: 45 V AC, 70 V AC, 110 V AC, 230 V AC, 277 V AC, 400 V AC, and 480 V AC.

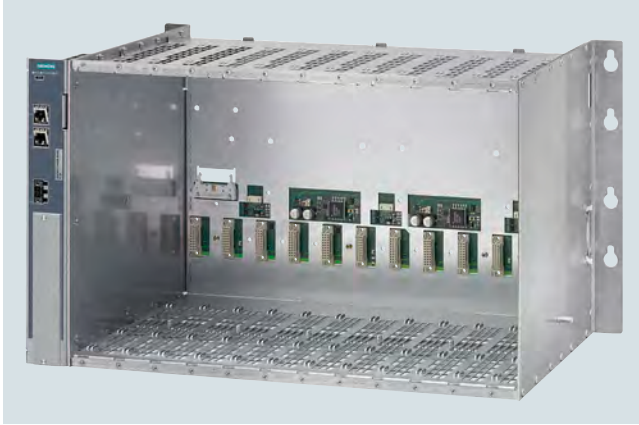
Communication takes place over PROFINET or PROFIBUS and, in combination with SIMATIC S7, SIMOTION or an industrial PC, forms a high-performance, state-of-the-art automation system. The modular, compact and space-saving distributed I/O system can be individually adapted to suit the application.

# I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

## SIPLUS HCS4200 heating control system > Rack

### Overview



SIPLUS HCS4200 heating control system

The rack constitutes the basic mechanical structure of the SIPLUS HCS4200.

### Ordering data

#### SIPLUS HCS Rack 4200 for 12 POMs

Rack for accommodating  
up to 12 POM4320 Power Output  
Modules

#### SIPLUS HCS Rack 4200 for 4 POMs

Rack for accommodating  
up to 4 POM4320 Power Output  
Modules

### Article No.

6BK1942-0AA00-0AA0

6BK1942-0BA00-0AA0

### Article No.

#### Accessories

#### SIPLUS HCS4200 Fan Module

#### SIPLUS HCS FM4240 Fan Module High Performance

Is attached to the top of the rack  
for accommodating up to  
4 Power Output Modules

#### Blanking cover (10 items)

For covering unoccupied slots  
in the rack

6BK1942-4AA00-0AA0

6BK1942-4BA00-0AA0

6BK1942-6DA00-0AA0

### Technical specifications

Article number	6BK1942-0AA00-0AA0	6BK1942-0BA00-0AA0
	HCS Rack4200 for 12 POM	HCS Rack4200 for 4 POM
<b>General information</b>		
Product type designation	Rack4200 for 12 POMs	RACK4200 for 4 POMs
<b>Installation type/mounting</b>		
Mounting type	Control cabinet backplane	
Mounting position	Horizontal	
Type of ventilation	Self ventilation or forced ventilation	
<b>Hardware configuration</b>		
<b>Slots</b>		
• Number of slots	12	4
<b>Interfaces</b>		
Interfaces/bus type	system interface	
<b>EMC</b>		
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011	
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge	
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)	

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4200 heating control system > Rack

#### Technical specifications

Article number	6BK1942-0AA00-0AA0	6BK1942-0BA00-0AA0
	HCS Rack4200 for 12 POM	HCS Rack4200 for 4 POM
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	0 °C	
• max.	55 °C	
<b>Ambient temperature during storage/transportation</b>		
• Storage, min.	-25 °C	
• Storage, max.	70 °C	
• Transportation, min.	-25 °C	
• Transportation, max.	70 °C	
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Operation, min.	860 Pa	
• Operation, max.	1 080 Pa	
• Storage, min.	660 Pa	
• Storage, max.	1 080 Pa	
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	
<b>Relative humidity</b>		
• Operation at 25 °C, max.	95 %	
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C	
<b>Vibrations</b>		
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g	
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g	
<b>Shock testing</b>		
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis	
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis	
<b>Dimensions</b>		
Width	488 mm	204 mm
Height	285 mm	
Depth	293 mm	

# I/O systems

## IO systems for heating elements with integrated power outputs - modular design

### SIPLUS HCS4200 heating control system > Central Interface Module (CIM)

#### Overview



The Central Interface Module (CIM) is the intelligent processor module of the SIPLUS HCS4200 heating control system.

#### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS HCS4200 CIM4210 PROFINET</b> Central Interface Module with PROFINET communication	<b>6BK1942-1AA00-0AA0</b>	<b>SIPLUS HCS4000 temperature I/O module</b> For recording temperatures using temperature sensors, thermocouples and pyrometers	<b>6BK1900-0AA00-0AA0</b>
<b>SIPLUS HCS4200 CIM4210 compact version PROFINET</b> Central Interface Module with PROFINET communication	<b>6BK1942-1AA00-0AA1</b>	<b>SIPLUS HCS4000 DI/DQ I/O module</b> With 8 digital outputs and 8 configurable inputs/outputs	<b>6BK1900-0BA00-0AA0</b>
<b>SIPLUS HCS4200 CIM4210 PROFIBUS</b> Central Interface Module with PROFIBUS communication	<b>6BK1942-1BA00-0AA0</b>	<b>SIPLUS HCS4000 U/I I/O module</b> For current and voltage measurement (line voltage compensation)	<b>6BK1900-0CA00-0AA0</b>
<b>Accessories</b>			
<b>SIPLUS HCS4200 connector set</b> As spare part, consisting of 20 x 2-pin connectors (24 V DC power supply)	<b>6BK1942-6FA00-0AA0</b>		

#### Technical specifications

Article number	<b>6BK1942-1AA00-0AA0</b> HCS CIM4210 PROFINET	<b>6BK1942-1AA00-0AA1</b> HCS CIM4210C PROFINET	<b>6BK1942-1BA00-0AA0</b> HCS CIM4210 PROFIBUS
<b>Installation type/mounting</b>			
Mounting type	Screw mounting to rack	Backplane mounting	Screw mounting to rack
Mounting position	vertical		
Type of ventilation	Forced ventilation	Self-ventilation	Forced ventilation
<b>Supply voltage</b>			
Type of supply voltage	DC		
Rated value (DC)	24 V		
relative symmetrical tolerance of the supply voltage	20 %		
<b>Connection method</b>			
• Design of electrical connection for supply voltage	Connector 2x 2-pin with tension spring connection		
- Connectable conductor cross-sections, solid	1x (0.2 ... 2.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.2 ... 2.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections for AWG cables	1x (26 ... 12)		

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4200 heating control system > Central Interface Module (CIM)

#### Technical specifications

Article number	<b>6BK1942-1AA00-0AA0</b> HCS CIM4210 PROFINET	<b>6BK1942-1AA00-0AA1</b> HCS CIM4210C PROFINET	<b>6BK1942-1BA00-0AA0</b> HCS CIM4210 PROFIBUS
<b>Power</b>			
Active power input	3 W	8 W	3 W
<b>Hardware configuration</b>			
<b>Slots</b>			
• Number of slots	1	2	1
<b>Interfaces</b>			
Interfaces/bus type	PROFINET IO		PROFIBUS DP
Transmission rate, max.	100 Mbit/s		12 Mbit/s
<b>PROFIBUS DP</b>			
• Design of electrical connection			9-pin sub D socket
<b>Supports protocol for PROFINET IO</b>			
• Design of electrical connection of PROFINET interface	2x RJ45		
<b>Protocols</b>			
Supports protocol for PROFINET IO	Yes		No
PROFIBUS DP	No		Yes
EtherNet/IP	No		
<b>Interrupts/diagnostics/status information</b>			
Number of status displays	3		
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display		
<b>Isolation</b>			
Overvoltage category	III		
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C		
• max.	55 °C		
<b>Ambient temperature during storage/transportation</b>			
• Storage, min.	-25 °C		
• Storage, max.	70 °C		
• Transportation, min.	-25 °C		
• Transportation, max.	70 °C		
<b>Air pressure acc. to IEC 60068-2-13</b>			
• Operation, min.	860 hPa		
• Operation, max.	1 080 hPa		
• Storage, min.	660 hPa		
• Storage, max.	1 080 hPa		
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m		
<b>Relative humidity</b>			
• Operation at 25 °C, max.	95 %		
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C		
<b>Vibrations</b>			
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g		
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g		
<b>Shock testing</b>			
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis		
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis		



## Overview



The Power Output Modules (POMs) are an essential component of the SIPLUS HCS4200 heating control system. Up to 24 Power Output Modules can be operated on one Central Interface Module (CIM), split over 2 racks.

There are 4 Power Output Module versions:

- POM4220 Lowend
- POM4220 Midrange phase control
- POM4220 Highend
- POM4220 Flexible

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS HCS4200 POM4220 Lowend</b> Power Output Module with 16 outputs for connecting resistive loads	<b>6BK1942-2AA00-0AA0</b>	<b>Spare fuse, 25 A/600 V, for the POM4220 Highend</b>	<b>6BK1942-6KA00-0AA0</b>
<b>SIPLUS HCS4200 POM4220 Midrange phase control</b> Power Output Module with 12 outputs for connecting resistive loads	<b>6BK1942-2CA00-0AA1</b>	<b>SIPLUS HCS4200 connector set</b> as accessory, comprising 10 connectors, 3-pin, for incoming supply, POM4220 Lowend	<b>6BK1943-6AA00-0AA0</b>
<b>SIPLUS HCS4200 POM4220 Highend</b> Power Output Module with 8 outputs for connecting resistive loads	<b>6BK1942-2DA00-0AA0</b>	<b>SIPLUS HCS4200 connector set</b> as accessory, comprising 5 connectors, 8-pin, for power outputs, POM4220 Lowend	<b>6BK1942-6CA00-0AA0</b>
<b>SIPLUS HCS4200 POM4220 Flexible</b> Power Output Module with 12 outputs for connecting resistive loads	<b>6BK1942-2FA00-0AA0</b>	<b>SIPLUS HCS4200 connector set</b> as accessory, comprising 6 connectors, 3-pin, for incoming supply, POM4220 Midrange phase control	<b>6BK1942-6GA00-0AA0</b>
<b>Accessories</b>		<b>SIPLUS HCS4200 connector set</b> as accessory, comprising 5 connectors, 6-pin, for power outputs, POM4220 Midrange phase control/Flexible	<b>6BK1942-6EA00-0AA0</b>
<b>Spare fuse, 6.3 A/250 V, for the POM4220 Lowend</b>	<b>6BK1942-6AA00-0AA0</b>	<b>SIPLUS HCS4200 connector set</b> as accessory, comprising 5 connectors, 4-pin, for power outputs, POM4220 Highend	<b>6BK1942-6LA00-0AA0</b>
<b>Spare fuse, 16 A/500 V, for the POM4220 Midrange phase control</b>	<b>6BK1942-6HA00-0AA0</b>		

## Technical specifications

Article number	<b>6BK1942-2AA00-0AA0</b> HCS POM4220 Lowend	<b>6BK1942-2CA00-0AA1</b> HCS POM4220 Midrange phase angle control	<b>6BK1942-2DA00-0AA0</b> HCS POM4220 Highend	<b>6BK1942-2FA00-0AA0</b> HCS POM4220 Flexible
<b>General information</b>				
Product type designation	POM4220 Lowend	POM4220 mid-range phase control	POM4220 High-end	POM4220 Flexible
<b>Installation type/mounting</b>				
Mounting type	Screw mounting to rack			
Mounting position	vertical			
Type of ventilation	Self ventilation or forced ventilation			
<b>Supply voltage</b>				
Type of supply voltage	AC			
Rated value (AC)	230 V			
• Relative negative tolerance	10 %			
• Relative positive tolerance	10 %		30 %	

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4200 heating control system > Power Output Module (POM)

#### Technical specifications

Article number	<b>6BK1942-2AA00-0AA0</b> HCS POM4220 Lowend	<b>6BK1942-2CA00-0AA1</b> HCS POM4220 Midrange phase angle control	<b>6BK1942-2DA00-0AA0</b> HCS POM4220 Highend	<b>6BK1942-2FA00-0AA0</b> HCS POM4220 Flexible
2nd rated value (AC)		277 V		
• Relative negative tolerance		25 %		
• Relative positive tolerance		8 %		
3rd rated value (AC)			400 V	110 V
• Relative negative tolerance			10 %	
• Relative positive tolerance			30 %	50 %
4th rated value (AC)			480 V	70 V
• Relative negative tolerance			25 %	10 %
• Relative positive tolerance			8 %	15 %
5th rated value (AC)				45 V
• Relative negative tolerance				10 %
• Relative positive tolerance				15 %
<b>Line frequency</b>				
• Rated value 50 Hz	Yes			
• Rated value 60 Hz	Yes			
• Relative symmetrical tolerance	5 %			
<b>Mains buffering</b>				
• Recovery time after power failure, typ.	1 s			
<b>Connection method</b>				
• Design of electrical connection for supply voltage	plug, 3-pole with spring-type terminal, push-in			
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm <sup>2</sup> )	1x (0.75 ... 16 mm <sup>2</sup> )		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm <sup>2</sup> )	1x (0.75 ... 16 mm <sup>2</sup> )		
- Connectable conductor cross-sections for AWG cables	1x (24 ... 8)	1x (18 ... 4)		
<b>Input voltage</b>				
device version of the power supply for electronics	Power supply via rack			
<b>Power</b>				
Active power input, max.	1 W		1.5 W	1 W
<b>Power electronics</b>				
Type of load	Ohmic load			
Power capacity, max.	16.1 kW; at 230 V AC	29.4 kW; at 230 V AC	51.2 kW; At 400 V AC 51.2 kW; At 400 V AC	29.4 kW; at 230 V AC
• For phase against phase with fan at 40 °C, max.			12.5 kW; At 400 V AC	
• For phase against phase without fan at 40 °C, max.				
• For phase against neutral with fan at 40 °C, max.	16.1 kW; at 230 V AC	29.4 kW; at 230 V AC		
• For phase against neutral without fan at 40 °C, max.	7.3 kW; at 230 V AC			
Switching capacity current per phase, max.	35 A	64 A		
Short-time withstand current (SCCR) acc. to UL 508A	50 kA	100 kA		
<b>Control of heating elements</b>				
• Half-wave control	Yes			
• Soft start	No	Yes		No
• Phase control	No	Yes		No
<b>Load connection type</b>				
• Star connection with neutral conductor (single-phase)	Yes			
• Open delta connection (single-phase)	No		Yes	No
• Closed delta connection (3-phase)	No			
• Star connection with neutral conductor (2-phase)	No		Yes; Economy circuit	No
• 2-pole switching	No		Yes; Phase - neutral conductor, phase - phase	No

# I/O systems

## IO systems for heating elements with integrated power outputs - modular design

### SIPLUS HCS4200 heating control system > Power Output Module (POM)

#### Technical specifications

Article number	<b>6BK1942-2AA00-0AA0</b> HCS POM4220 Lowend	<b>6BK1942-2CA00-0AA1</b> HCS POM4220 Midrange phase angle control	<b>6BK1942-2DA00-0AA0</b> HCS POM4220 Highend	<b>6BK1942-2FA00-0AA0</b> HCS POM4220 Flexible
<b>Setpoint input</b>				
• Percent	Yes			
• Watts	No		Yes	No
<b>Heating power</b>				
• Number of digital outputs	16	12	8	12
• Number of heating elements per output, max.	1		5; Recommended, depends on tolerance of heating elements	1
• Output voltage for heating power	230 V			
• 2nd output voltage for heating power		277 V		
• 3rd output voltage for heating power			400 V	110 V
• 4th output voltage for heating power			480 V	70 V
• 5th output voltage for heating power				45 V
• Power carrying capacity per output, min.	40 W; at 230 V AC	60 W; at 230 V AC	400 W; at 230 V AC	100 W; at 230 V AC
• Power carrying capacity per output, max.	1 449 W; at 230 V AC	3 680 W; at 230 V AC	4 600 W; at 230 V AC	3 680 W; at 230 V AC
- for heating elements with high inrush current, max.	750 W; at 230 V AC	1 600 W; at 230 V AC	2 700 W; at 230 V AC	1 600 W; at 230 V AC
• Output current for heating power	6.3 A; max.	16 A; max.	20 A; max.	16 A; max.
• Melting I <sup>2</sup> t value	57 A <sup>2</sup> ·s	20 A <sup>2</sup> ·s	120 A <sup>2</sup> ·s	20 A <sup>2</sup> ·s
• Design of short-circuit protection per output	Safety fuse 6.3 A	Fuse 16 A	Melting fuse 25 A	Fuse 16 A
• Design of overvoltage protection	Transil Diode			
<b>Connection method</b>				
• Design of electrical connection at output for heating and fan	plug, 8-pole with spring-type terminal, push-in	plug, 6-pole with spring-type terminal, push-in	plug, 4-pole with spring-type terminal, push-in	plug, 6-pole with spring-type terminal, push-in
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm <sup>2</sup> )			
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm <sup>2</sup> )			
- Connectable conductor cross-sections for AWG cables, stranded	1x (24 ... 8)			
<b>Interfaces</b>				
Interfaces/bus type	system interface			
<b>Interrupts/diagnostics/status information</b>				
Number of status displays	19	15	11	15
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel			
Diagnostics function	Voltage diagnostics		Voltage and current diagnosis	Voltage diagnostics
<b>Diagnoses</b>				
• Fuse blown	Yes			
• Load failure	Yes			
• Triac error	Yes			
• Switch-off threshold for internal device temperature	Yes			
• Parallel-connected heating elements	No		Yes	No
• Rotating field fault	Yes	No	Yes	No
• Communication error	Yes			
• Supply voltage not connected	Yes			
• Line voltage outside the permissible range	Yes	No	Yes	No
• Frequency outside the permissible range	Yes			
• Fault current too high	No		Yes	No

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4200 heating control system > Power Output Module (POM)

#### Technical specifications

Article number	6BK1942-2AA00-0AA0	6BK1942-2CA00-0AA1	6BK1942-2DA00-0AA0	6BK1942-2FA00-0AA0
	HCS POM4220 Lowend	HCS POM4220 Midrange phase angle control	HCS POM4220 Highend	HCS POM4220 Flexible
<b>Integrated Functions</b>				
<b>Monitoring functions</b>				
• Temperature monitoring	Yes			
• Type of temperature monitoring	NTC thermistor			
<b>Measuring functions</b>				
• Voltage measurement	No		Yes	No
• Current measurement	No		Yes	No
• Fault current detection	No		Yes; For 2-pole switching	No
<b>Potential separation</b>				
Design of electrical isolation between the outputs	Optocoupler and/or protective impedance between main circuit and PELV No			
<b>Isolation</b>				
Overvoltage category	III			
<b>EMC</b>				
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011			
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge			
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)			
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV load lines			
Conducted interference due to surge acc. to IEC 61000-4-5	Supply and load lines: 1 kV symmetrical, 2 kV asymmetrical			
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)			
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	0 °C			
• max.	55 °C			
<b>Ambient temperature during storage/transportation</b>				
• Storage, min.	-25 °C			
• Storage, max.	70 °C			
• Transportation, min.	-25 °C			
• Transportation, max.	70 °C			
<b>Air pressure acc. to IEC 60068-2-13</b>				
• Operation, min.	860 hPa			
• Operation, max.	1 080 hPa			
• Storage, min.	660 hPa			
• Storage, max.	1 080 hPa			
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	2 000 m			
<b>Relative humidity</b>				
• Operation at 25 °C, max.	95 %			
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C			
<b>Vibrations</b>				
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g			
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g			
<b>Shock testing</b>				
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis			
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis			
<b>Dimensions</b>				
Width	36 mm			
Height	285 mm			
Depth	281 mm			

**Overview**

HCS4300 2POM

The SIPLUS HCS4300 heating control system controls heating elements and other resistive loads in 230 V/277 V and 400 V/480 V voltage supply systems in industrial environments.

Communication takes place via PROFINET or PROFIBUS and can be used together with SIMATIC S7, for example, to form a highly modern and powerful automation system.

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4300 heating control system > Central interface module (CIM)

#### Overview



The Central Interface Module (CIM) is the intelligent processor module of the SIPLUS HCS4300 heating control system.

#### Ordering data

##### SIPLUS HCS4300 CIM4310

Central Interface Module with PROFINET communication

#### Article No.

**6BK1943-1AA00-0AA0**

Central Interface Module with PROFIBUS communication

**6BK1943-1BA00-0AA0**

#### Accessories

##### SIPLUS HCS4300 EM4315

Expansion module for SIPLUS HCS4300, extends the configuration with 8 Power Output Modules

**6BK1943-1AA50-0AA0**

#### Article No.

##### SIPLUS HCS4000 I/O module temperature

For recording temperatures using temperature sensors, thermocouples and pyrometers

**6BK1900-0AA00-0AA0**

##### SIPLUS HCS4000 I/O module DI/DO

With 8 digital outputs and 8 configurable inputs/outputs

**6BK1900-0BA00-0AA0**

##### SIPLUS HCS4000 I/O module U/I

For current and voltage measurement (line voltage compensation)

**6BK1900-0CA00-0AA0**

#### Technical specifications

Article number	<b>6BK1943-1AA00-0AA0</b>	<b>6BK1943-1BA00-0AA0</b>	<b>6BK1943-1AA50-0AA0</b>
	HCS CIM4310 PROFINET	HCS CIM4310 PROFIBUS	HCS EM4315 Extension Module
<b>General information</b>			
Product type designation			EM4315
<b>Installation type/mounting</b>			
Mounting type	Screw mounting to POM		
Mounting position	vertical		
Type of ventilation	Forced ventilation		
<b>Supply voltage</b>			
Type of supply voltage	DC		
Rated value (DC)	24 V		
relative symmetrical tolerance of the supply voltage	20 %		
<b>Connection method</b>			
• Design of electrical connection for supply voltage	Connector 2x 2-pin with tension spring connection		
- Connectable conductor cross-sections, solid	1x (0.2 ... 2.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.2 ... 2.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections for AWG cables	1x (26 ... 12)		
<b>Power</b>			
Active power input	3 W		1 W

## Technical specifications

Article number	<b>6BK1943-1AA00-0AA0</b>	<b>6BK1943-1BA00-0AA0</b>	<b>6BK1943-1AA50-0AA0</b>
	HCS CIM4310 PROFINET	HCS CIM4310 PROFIBUS	HCS EM4315 Extension Module
<b>Hardware configuration</b>			
<b>Slots</b>			
• Number of slots	1		0
<b>Interfaces</b>			
Interfaces/bus type	PROFINET IO	PROFIBUS DP	system interface
Transmission rate, max.	100 Mbit/s	12 Mbit/s	
<b>PROFIBUS DP</b>			
• Design of electrical connection		9-pin sub D socket	
<b>Supports protocol for PROFINET IO</b>			
• Design of electrical connection of PROFINET interface	2x RJ45		
<b>Protocols</b>			
Supports protocol for PROFINET IO	Yes	No	
PROFIBUS DP	No	Yes	No
EtherNet/IP	No		
<b>Interrupts/diagnostics/ status information</b>			
Number of status displays	3		1
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display		LED green = ready
<b>Isolation</b>			
Overvoltage category	III		
<b>EMC</b>			
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011		
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge		
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)		
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV PROFINET cables	2 kV power supply lines / 2 kV PROFIBUS cables	2 kV power supply lines
Conducted interference due to surge acc. to IEC 61000-4-5	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric	DC supply lines: 0.5 kV symmetrical and asymmetrical, PROFIBUS lines: 1 kV asymmetrical	On DC supply lines: 0.5 kV symmetrical and asymmetrical
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)		
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C		
• max.	55 °C		
<b>Ambient temperature during storage/transportation</b>			
• Storage, min.	-25 °C		
• Storage, max.	70 °C		
• Transportation, min.	-25 °C		
• Transportation, max.	70 °C		
<b>Air pressure acc. to IEC 60068-2-13</b>			
• Operation, min.	860 hPa		
• Operation, max.	1 080 hPa		
• Storage, min.	660 hPa		
• Storage, max.	1 080 hPa		
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m		
<b>Relative humidity</b>			
• Operation at 25 °C, max.	95 %		
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C		

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4300 heating control system > Central interface module (CIM)

#### Technical specifications

Article number	<b>6BK1943-1AA00-0AA0</b> HCS CIM4310 PROFINET	<b>6BK1943-1BA00-0AA0</b> HCS CIM4310 PROFIBUS	<b>6BK1943-1AA50-0AA0</b> HCS EM4315 Extension Module
<b>Vibrations</b>			
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g		
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g		
<b>Shock testing</b>			
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis		
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis		
<b>Dimensions</b>			
Width	56 mm		
Height	285 mm		
Depth	136 mm		
Article number	<b>6BK1900-0BA00-0AA0</b> HCS I/O4000 DI/DO	Article number	<b>6BK1900-0BA00-0AA0</b> HCS I/O4000 DI/DO
<b>General information</b>			
Product type designation	PM4000 DI/DO		
<b>Installation type/mounting</b>			
Mounting type	Screw mounting to CIM		
Mounting position	vertical		
Type of ventilation	Forced ventilation		
<b>Supply voltage</b>			
Design of the power supply	Power supply via CIM		
<b>Power</b>			
Active power input, max.	1 W		
<b>Digital inputs</b>			
Number of digital inputs	8		
<b>Connection method</b>			
• Design of electrical connection at the digital inputs	1x 18 pole connector with spring-loaded connection		
- Connectable conductor cross-sections, solid	1x (0.2 ... 1.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 1.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections for AWG cables	1x (24 ... 16)		
<b>Digital outputs</b>			
Type of digital output	semiconductor output (high side switch)		
Number of digital outputs	16		
Switching performance	monostable		
short-circuit proof	Yes		
<b>Output voltage</b>			
• Type of output voltage	DC		
• Rated value (DC)	24 V		
• permissible voltage at output, min.	19.2 V		
• permissible voltage at output, max.	28.8 V		
<b>Output current</b>			
• for signal **1* permissible range, max.	500 mA		
<b>Connection method</b>			
• Design of electrical connection at the digital outputs	2x 18 pole connector with spring-loaded connection		
- Connectable conductor cross-sections, solid	1x (0.2 ... 1.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 1.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections for AWG cables	1x (24 ... 16)		
• Design of electrical connection for control supply voltage	2x 18 pole connector with spring-loaded connection		
- Connectable conductor cross-sections with wire end processing	1x (0.25 ... 1.5 mm <sup>2</sup> )		
- Connectable conductor cross-sections for AWG cables	1x (24 ... 16)		
<b>Interfaces</b>			
Interfaces/bus type	system interface		
<b>Interrupts/diagnostics/status information</b>			
Number of status displays	18		
LED status display	LED green = Ready, LED red = Error display, 1 LED yellow per output: LED on - H status; LED off -L status		
<b>Potential separation</b>			
between outputs and system interface	Yes		
<b>Isolation</b>			
Overvoltage category	III		
<b>EMC</b>			
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011		
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge		
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)		
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV signal lines		
Conducted interference due to surge acc. to IEC 61000-4-5	DC supply cables: 0.5 kV balanced and unbalanced		
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)		



## Technical specifications

Article number	<b>6BK1900-0BA00-0AA0</b> HCS I/O4000 DI/DO
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-25 °C
• Storage, max.	70 °C
• Transportation, min.	-25 °C
• Transportation, max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	860 hPa
• Operation, max.	1 080 hPa
• Storage, min.	660 hPa
• Storage, max.	1 080 hPa
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• Operation at 25 °C, max.	95 %
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C
<b>Vibrations</b>	
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g
<b>Shock testing</b>	
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis
<b>Dimensions</b>	
Width	27 mm
Height	141 mm
Depth	110 mm
Article number	<b>6BK1900-0CA00-0AA0</b> HCS I/O4000 U/I
<b>General information</b>	
Product type designation	For PM4000 U/I
<b>Installation type/mounting</b>	
Mounting type	Screw mounting to CIM
Mounting position	vertical
Type of ventilation	Forced ventilation
<b>Supply voltage</b>	
Design of the power supply	Power supply via CIM
<b>Power</b>	
Active power input, max.	1 W
<b>Interfaces</b>	
Interfaces/bus type	system interface
<b>Interrupts/diagnostics/status information</b>	
Number of status displays	2
LED status display	LED green = Ready, LED red = Error display

Article number	<b>6BK1900-0CA00-0AA0</b> HCS I/O4000 U/I
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
• Voltage measurement	Yes
• Current measurement	Yes
<b>Operating mode for measured value acquisition</b>	
- Operating frequency, min.	50 Hz
- Operating frequency, max.	60 Hz
<b>Measuring inputs for voltage</b>	
- Voltage measurement range, min.	230 V
- Voltage measuring range, max.	480 V
- Relative measuring accuracy voltage	0.5 %
- Design of electrical connection at the measuring inputs for voltage	plug, 6-pole with spring-type terminal, push-in
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm <sup>2</sup> )
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm <sup>2</sup> )
- Connectable conductor cross-sections for AWG cables	1x (24 ... 8)
<b>Measuring inputs for current</b>	
- Current measurement range, min.	0 A
- Current measurement range, max.	5 A
- Relative measuring accuracy current	0.5 %
- Design of electrical connection at the measuring inputs for current	plug, 8-pole with spring-type terminal, push-in
- Connectable conductor cross-sections, solid	1x (0.2 ... 1.5 mm <sup>2</sup> )
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.2 ... 1.5 mm <sup>2</sup> )
- Connectable conductor cross-sections for AWG cables	1x (24 ... 16)
<b>Isolation</b>	
Overvoltage category	III
<b>EMC</b>	
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV signal lines
Conducted interference due to surge acc. to IEC 61000-4-5	Voltage measurement inputs: 1 kV balanced, 2 kV unbalanced
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4300 heating control system > Central interface module (CIM)

#### Technical specifications

Article number	<b>6BK1900-0CA00-0AA0</b> HCS I/O4000 U/I
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-25 °C
• Storage, max.	70 °C
• Transportation, min.	-25 °C
• Transportation, max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	860 hPa
• Operation, max.	1 080 hPa
• Storage, min.	660 hPa
• Storage, max.	1 080 hPa
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• Operation at 25 %, max.	95 %
• Operation at 50 %, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C
<b>Vibrations</b>	
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g
<b>Shock testing</b>	
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis
<b>Dimensions</b>	
Width	27 mm
Height	141 mm
Depth	110 mm
Article number	<b>6BK1900-0AA00-0AA0</b> HCS I/O4000 Temperature
<b>General information</b>	
Product type designation	PM4000 temperature
<b>Installation type/mounting</b>	
Mounting type	Screw mounting to CIM
Mounting position	vertical
Type of ventilation	Forced ventilation
<b>Supply voltage</b>	
Design of the power supply	Power supply via CIM
<b>Power</b>	
Active power input, max.	1 W
<b>Analog inputs</b>	
Number of analog inputs	
• for 2-wire system	4
• for 4-wire system	2
Sensor current, typ.	210 µA
Impulse voltage resistance, max.	15 V
<b>Input ranges</b>	
• Thermocouple	Yes
• Resistance thermometer	Yes

Article number	<b>6BK1900-0AA00-0AA0</b> HCS I/O4000 Temperature
<b>Measuring range</b>	
• Temperature for type J thermocouple, min.	0 °C
• Temperature for type J thermocouple, max.	650 °C
• Temperature for type K thermocouple, min.	0 °C
• Temperature for type K thermocouple, max.	440 °C
• Temperature for type L thermocouple, min.	0 °C
• Temperature for type L thermocouple, max.	640 °C
• Temperature for Pt 100 according to IEC 60751, min.	0 °C
• Temperature for Pt 100 according to IEC 60751, max.	410 °C
• Temperature for Pt 1000 according to IEC 60751, min.	0 °C
• Temperature for Pt 1000 according to IEC 60751, max.	850 °C
<b>Connection method</b>	
• Design of electrical connection for temperature sensors	plug, 8-pole with spring-type terminal, push-in
- Connectable conductor cross-sections for AWG cables	1x (24 ... 16)
- Connectable conductor cross-sections, solid	1x (0.2 ... 1.5 mm <sup>2</sup> )
- Connectable conductor cross-sections with wire end processing	1x (0.25 ... 1.5 mm <sup>2</sup> )
<b>Analog value generation for the inputs</b>	
Type of A/D conversion	Sigma Delta
Conversion time	150 ms
<b>Errors/accuracies</b>	
Temperature drift per °C, typ.	0.05 %/°C
Temperature offset per K, max.	0.1 K/K
<b>Interfaces</b>	
Interfaces/bus type	system interface
<b>Interrupts/diagnostics/status information</b>	
Number of status displays	2
LED status display	LED green = Ready, LED red = Error display
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
• Current measurement	Yes
<b>Measuring inputs for current</b>	
- Current measurement range, min.	0 mA
- Current measurement range, max.	20 mA
- Relative measuring accuracy current	0.5 %
- Design of electrical connection at the measuring inputs for current	plug, 8-pole with spring-type terminal, push-in
- Connectable conductor cross-sections, solid	1x (0.2 ... 1.5 mm <sup>2</sup> )
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 1.5 mm <sup>2</sup> )
- Connectable conductor cross-sections for AWG cables	1x (24 ... 16)

## Technical specifications

Article number	<b>6BK1900-0AA00-0AA0</b> HCS I/O4000 Temperature
<b>Potential separation</b> between the channels	No
<b>Isolation</b> Overvoltage category	III
<b>EMC</b> EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV signal lines
Conducted interference due to surge acc. to IEC 61000-4-5	Not applicable
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)
<b>Ambient conditions</b> <b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C

Article number	<b>6BK1900-0AA00-0AA0</b> HCS I/O4000 Temperature
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-25 °C
• Storage, max.	70 °C
• Transportation, min.	-25 °C
• Transportation, max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	860 hPa
• Operation, max.	1 080 hPa
• Storage, min.	660 hPa
• Storage, max.	1 080 hPa
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• Operation at 25 °C, max.	95 %
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C
<b>Vibrations</b>	
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g
<b>Shock testing</b>	
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis
<b>Dimensions</b>	
Width	27 mm
Height	141 mm
Depth	110 mm

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4300 heating control system > Power Output Module (POM)

#### Design



- Module (encapsulated) in a metal enclosure.
- There are 6 versions:
  - POM4320 busbar mounting (IEC):  
a current of up to 16 A can be used per output
  - POM4320 busbar mounting (UL):  
a current of up to 15 A can be used per output
  - POM4320 rear panel mounting (IEC):  
a current of up to 16 A can be used per output
  - POM4320 rear panel mounting (UL):  
a current of up to 15 A can be used per output
  - POM4320 Highend busbar mounting:  
a current of up to 60 A can be used per output
  - POM4320 Highend rear panel mounting:  
a current of up to 60 A can be used per output
- Heat dissipation by fan fitted to top of module.
- Internal serial interface.
- Three diagnostics LEDs for displaying module faults.
- POM4320: 9 diagnostics LEDs for displaying output errors.
- POM4320 Highend: 6 diagnostics LEDs for displaying output errors.

#### Ordering data

#### Article No.

##### SIPLUS HCS4300 POM4320

Power output module with 9 outputs  
for connecting resistive loads

IEC, busbar mounting,  
redesign version with enhanced  
interference immunity

6BK1943-2AA00-0AA2

UL, busbar mounting, redesign  
version with enhanced interference  
immunity and 100 kA SCCR

6BK1943-2BA00-0AA2

IEC, rear panel mounting,  
redesign version with enhanced  
interference immunity

6BK1943-2CA00-0AA2

UL, rear panel mounting, redesign  
version with enhanced interference  
immunity and 100 kA SCCR

6BK1943-2DA00-0AA2

POM4320 Highend,  
busbar mounting

6BK1943-2AH00-0AA0

POM4320 Highend, panel mounting

6BK1943-2CH00-0AA0

#### Article No.

##### Accessories

##### SIPLUS HCS4300 connecting cable from POM to POM

- Consisting of 10 units,  
100 mm long
- Consisting of 10 units,  
250 mm long
- Consisting of 10 units,  
1000 mm long
- Consisting of 10 units,  
1500 mm long

6BK1943-5AA00-0AA0

6BK1943-5BA00-0AA0

6BK1943-5CA00-0AA0

6BK1943-5DA00-0AA0

##### HCS4300 connector set for POM4320

- Consisting of  
10 x 3-pin connectors

6BK1943-6AA00-0AA0

##### Spare fuse, 16 A/500 V, for POM4320

6BK1943-6BA00-0AA0

##### Fan as spare part POM4320

6BK1700-2GA00-0AA0

##### Spare fuse, 32 A/690 V, for POM4320 Highend

6BK1943-6EA00-0AA0

##### HCS4300 connector set for POM4320 Highend

6BK1943-6FA00-0AA0

##### Fan as spare part POM4320 Highend

6BK1943-6GA00-0AA0

##### HCS Jumper POM4320 Highend

6BK1943-6HA00-0AA0

## Technical specifications

Article number	6BK1943-2AA00-0AA2	6BK1943-2AH00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA2	6BK1943-2CH00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 Highend busbar mounting	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 Highend panel mounting	HCS POM4320 panel mounting (UL)
<b>General information</b>						
Product type designation	POM4320 BUSBAR MOUNTING (IEC)	POM4320 Highend	POM4320 BUSBAR MOUNTING (UL)	POM4320 rear panel mounting (IEC)	POM4320 Highend	POM4320 rear panel mounting (UL)
<b>Installation type/mounting</b>						
Mounting type	Busbar mounting			Backplane mounting		
Mounting position	vertical					
Type of ventilation	Self-ventilation					
<b>Supply voltage</b>						
Type of supply voltage	AC					
Rated value (AC)	400 V	230 V	400 V		230 V	400 V
• Relative negative tolerance	10 %					
• Relative positive tolerance	30 %					
2nd rated value (AC)	480 V	277 V	480 V		277 V	480 V
• Relative negative tolerance	25 %					
• Relative positive tolerance	8 %					
3rd rated value (AC)		400 V			400 V	
• Relative negative tolerance	10 %					
• Relative positive tolerance	30 %					
4th rated value (AC)		480 V			480 V	
• Relative negative tolerance	25 %					
• Relative positive tolerance	8 %					
<b>Line frequency</b>						
• Rated value 50 Hz	Yes					
• Rated value 60 Hz	Yes					
• Relative symmetrical tolerance	5 %					
<b>Mains buffering</b>						
• Recovery time after power failure, typ.	1 s					
<b>Connection method</b>						
• Design of electrical connection for supply voltage	Busbar mounting, 3-pole + PE	Busbar adapter, 3-pole + N + PE	Busbar mounting, 3-pole + PE	terminal, 3-pole + PE	Terminal, 3-pole + N + PE	terminal, 3-pole + PE
- Connectable conductor cross-sections, solid				1x (1.5 ... 50 mm <sup>2</sup> )		
- Connectable conductor cross-sections, finely stranded with wire end processing				1x (1.5 ... 35 mm <sup>2</sup> )		
- Connectable conductor cross-sections for AWG cables				1x (16 ... 1)		
- Cable cross-sections for N	1x (0.2 ... 2.5 mm <sup>2</sup> )			1x (0.2 ... 2.5 mm <sup>2</sup> )		
<b>Input voltage</b>						
device version of the power supply for electronics	Power supply via CIM					
<b>Power</b>						
Active power input, max.	8 W	10 W	8 W		10 W	8 W
<b>Power electronics</b>						
Type of load	Ohmic load					
Power capacity, max.	57.6 kW; At 400 V AC	76.8 kW; At 400 V AC	64.8 kW; At 480 V AC	57.6 kW; At 400 V AC	76.8 kW; At 400 V AC	64.8 kW; At 480 V AC
• For phase against phase with fan at 40 °C, max.	57.6 kW; At 400 V AC	76.8 kW; At 400 V AC	64.8 kW; At 480 V AC	57.6 kW; At 400 V AC	76.8 kW; At 400 V AC	64.8 kW; At 480 V AC
• For phase against neutral with fan at 40 °C, max.	44.16 kW; at 230 V AC			44.16 kW; at 230 V AC		
Switching capacity current per phase, max.	83 A		80 A	83 A	105 A; 90 A (UL)	
Short-time withstand current (SCCR) acc. to UL 508A			100 kA		100 kA	

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4300 heating control system > Power Output Module (POM)

#### Technical specifications

Article number	6BK1943-2AA00-0AA2	6BK1943-2AH00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA2	6BK1943-2CH00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 Highend busbar mounting	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 Highend panel mounting	HCS POM4320 panel mounting (UL)
<b>Control of heating elements</b>						
• Half-wave control	Yes					
• Soft start	Yes					
• Phase control	Yes					
<b>Load connection type</b>						
• Star connection with neutral conductor (single-phase)	No	Yes	No		Yes	No
• Open delta connection (single-phase)	Yes; Incoming fuse contained in the device	Yes; Incoming fuse in the device optionally possible	Yes; Incoming fuse contained in the device		Yes; Incoming fuse in the device optionally possible	Yes; Incoming fuse contained in the device
• Closed delta connection (3-phase)	No	Yes	No		Yes	No
• Star connection with neutral conductor (2-phase)	No					
• 2-pole switching	No	Yes; Phase - phase	No		Yes; Phase - phase	No
<b>Setpoint input</b>						
• Percent	Yes					
• Watts	No	Yes	No		Yes	No
<b>Heating power</b>						
• Number of digital outputs	9	6; Possible parallel switching of 2 outputs	9		6; Possible parallel switching of 2 outputs	9
• Number of heating elements per output, max.	1	5	1		5	1
• Output voltage for heating power	400 V	230 V	400 V		230 V	400 V
• 2nd output voltage for heating power	480 V	277 V	480 V		277 V	480 V
• 3rd output voltage for heating power		400 V			400 V	
• 4th output voltage for heating power		480 V			480 V	
• Power carrying capacity per output, min.	200 W; At 400 V AC	1 200 W; At 400 V AC	200 W; At 480 V AC	200 W; At 400 V AC	1 200 W; At 400 V AC	200 W; At 480 V AC
• Power carrying capacity per output, max.	6 400 W; At 400 V AC	12 800 W; At 400 V AC	7 200 W; At 480 V AC	6 400 W; At 400 V AC	12 800 W; At 400 V AC	7 200 W; At 480 V AC
- for heating elements with high inrush current, max.	4 000 W; At 400 V AC	6 000 W; At 400 V AC	4 000 W; At 480 V AC	4 000 W; At 400 V AC	6 000 W; At 400 V AC	4 000 W; At 480 V AC
• Output current for heating power	16 A; max.	32 A; max.	15 A; max.	16 A; max.	32 A; max.	15 A; max.
• Melting I2t value	250 A <sup>2</sup> ·s		400 A <sup>2</sup> ·s	250 A <sup>2</sup> ·s		400 A <sup>2</sup> ·s
• Design of short-circuit protection per output	Fuse 16 A	Melting fuse 32 A	Melting fuse 20 A	Fuse 16 A	Melting fuse 32 A	Melting fuse 20 A
• Design of overvoltage protection	Transil Diode					
<b>Connection method</b>						
• Design of electrical connection at output for heating and fan	plug, 3-pole with spring-type terminal, push-in	plug, 3-pole, with operating lever, push-in	plug, 3-pole with spring-type terminal, push-in		plug, 3-pole, with operating lever, push-in	plug, 3-pole with spring-type terminal, push-in
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm <sup>2</sup> )	1x (0.75 ... 16 mm <sup>2</sup> )	1x (0.2 ... 10 mm <sup>2</sup> )		1x (0.75 ... 16 mm <sup>2</sup> )	1x (0.2 ... 10 mm <sup>2</sup> )
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm <sup>2</sup> )	1x (0.75 ... 16 mm <sup>2</sup> )	1x (0.25 ... 6 mm <sup>2</sup> )		1x (0.75 ... 16 mm <sup>2</sup> )	1x (0.25 ... 6 mm <sup>2</sup> )
- Connectable conductor cross-sections for AWG cables, stranded	1x (24 ... 8)	1x (18 ... 4)	1x (24 ... 8)		1x (18 ... 4)	1x (24 ... 8)
<b>Interfaces</b>						
Interfaces/bus type	system interface					
<b>Interrupts/diagnostics/status information</b>						
Number of status displays	12	9	12		9	12
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel					
Diagnostics function	Voltage diagnostics	Voltage and current diagnosis	Voltage diagnostics		Voltage and current diagnosis	Voltage diagnostics

## Technical specifications

Article number	6BK1943-2AA00-0AA2	6BK1943-2AH00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA2	6BK1943-2CH00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 Highend busbar mounting	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 Highend panel mounting	HCS POM4320 panel mounting (UL)
<b>Diagnoses</b>						
• Fuse blown	Yes					
• Load failure	Yes					
• Triac error	Yes					
• Switch-off threshold for internal device temperature	Yes					
• Parallel-connected heating elements	No	Yes	No		Yes	No
• Rotating field fault	Yes					
• Communication error	Yes					
• Supply voltage not connected	Yes					
• Line voltage outside the permissible range	Yes					
• Frequency outside the permissible range	Yes					
• Fault current too high	No	Yes	No		Yes	No
<b>Integrated Functions</b>						
<b>Monitoring functions</b>						
• Temperature monitoring	Yes					
• Type of temperature monitoring	NTC thermistor					
<b>Measuring functions</b>						
• Voltage measurement	Yes					
• Current measurement	No	Yes	No		Yes	No
• Fault current detection	No	Yes; For 2-pole switching	No		Yes; For 2-pole switching	No
<b>Potential separation</b>						
Design of electrical isolation between the outputs	Optocoupler and/or protective impedance between main circuit and PELV No					
<b>Isolation</b>						
Overvoltage category	III					
<b>EMC</b>						
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011					
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge					
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)					
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV load lines					
Conducted interference due to surge acc. to IEC 61000-4-5	on supply and load lines: 1 kV symmetric, 2 kV unsymmetric					
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)					
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• min.	0 °C					
• max.	55 °C					
<b>Ambient temperature during storage/transportation</b>						
• Storage, min.	-25 °C					
• Storage, max.	70 °C					
• Transportation, min.	-25 °C					
• Transportation, max.	70 °C					

## I/O systems

IO systems for heating elements  
with integrated power outputs - modular design

### SIPLUS HCS4300 heating control system > Power Output Module (POM)

#### Technical specifications

Article number	6BK1943-2AA00-0AA2	6BK1943-2AH00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA2	6BK1943-2CH00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 Highend busbar mounting	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 Highend panel mounting	HCS POM4320 panel mounting (UL)
<b>Air pressure acc. to IEC 60068-2-13</b>						
• Operation, min.	860 hPa					
• Operation, max.	1 080 hPa					
• Storage, min.	660 hPa					
• Storage, max.	1 080 hPa					
<b>Altitude during operation relating to sea level</b>						
• Installation altitude above sea level, max.	2 000 m					
<b>Relative humidity</b>						
• Operation at 25 °C, max.	95 %					
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C					
<b>Vibrations</b>						
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g					
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g					
<b>Shock testing</b>						
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis					
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis					
<b>Dimensions</b>						
Width	104 mm					
Height	340 mm			344 mm		
Depth	250 mm			217 mm		



**Overview**


- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slaves (DP-V1)
- Automatic determination of fault types and locations
- Data transmission rate 9.6 kbps to 12 Mbps
- Connection via FastConnect using IDC

**Ordering data**

Ordering data	Article No.
<b>RS 485 diagnostics repeater</b> For connection of 1 or 2 segments to PROFIBUS DP; with online diagnostics functions for monitoring the bus lines	6ES7972-0AB01-0XA0
<b>Accessories</b>	
<b>RS 485 bus connector with 90° cable outlet</b> With screw terminals, max. transfer rate 12 Mbps <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul>	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
<b>PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet</b> With insulation displacement terminals, max. transfer rate 12 Mbps Without PG interface <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul> With PG interface <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul> Without PG interface, grounding via control cabinet cover <ul style="list-style-type: none"> <li>• 1 unit</li> </ul> With PG interface, grounding via control cabinet cover <ul style="list-style-type: none"> <li>• 1 unit</li> </ul>	6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0 6ES7972-0BA70-0XA0 6ES7972-0BB70-0XA0
<b>RS 485 bus connector with angled cable outlet (35°)</b> With screw terminals, max. transfer rate 12 Mbps <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul>	6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0

**Article No.**

<b>PROFIBUS FastConnect RS 485 bus connector with angular cable outlet (35°)</b> With insulation displacement terminals, max. transfer rate 12 Mbps <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul>	6ES7972-0BA61-0XA0 6ES7972-0BB61-0XA0
<b>PROFIBUS FastConnect Stripping Tool</b> Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00
<b>PROFIBUS FC Standard Cable</b> Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	6XV1830-0EH10
<b>S7 Manual Collection</b> Electronic manuals on DVD, multilingual: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	6ES7998-8XC01-8YE0
<b>S7 Manual Collection update service for 1 year</b> Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	6ES7998-8XC01-8YE2
<b>Connecting cable for PROFIBUS</b> 12 Mbps, for PG connection to PROFIBUS DP, pre-assembled with 2 x 9-pin sub D plug, 3.0 m	6ES7901-4BD00-0XA0

## I/O systems

### PROFIBUS components

#### Diagnostics

### PROFIBUS DP diagnostic repeater

#### Technical specifications

Article number	<b>6ES7972-0AB01-0XA0</b> Diagnostic repeater f. PROFIBUS-DP,
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Operation, max.	95 %; at 25 °C

Article number	<b>6ES7972-0AB01-0XA0</b> Diagnostic repeater f. PROFIBUS-DP,
<b>Connection method</b>	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	FastConnect insulation displacement, 10 clamping cycles possible
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	67.5 mm
<b>Weights</b>	
Weight, approx.	300 g

**SIPLUS diagnostic repeater for PROFIBUS**
**Overview**


- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slave (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 kbps to 12 Mbps
- Connection via FastConnect IDC

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**Ordering data**
**Article No.**
**Article No.**
**SIPLUS RS 485 diagnostics repeater**

To connect up to 2 segments to PROFIBUS DP, with online diagnostics functions for monitoring the bus lines

Exposure to environmental substances

**6AG1972-0AB01-4XA0**
**Accessories**
**RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbps

Extended temperature range and exposure to environmental substances

- without PG interface
- with PG interface

**6AG1972-0BA12-2XA0**  
**6AG1972-0BB12-2XA0**
**RS 485 bus connector with angled cable outlet**

(Extended temperature range -40 °C ... +70 °C and exposure to environmental substances)

Max. transfer rate 12 Mbps

- without PG interface
- with PG interface

**6AG1972-0BA42-7XA0**  
**6AG1972-0BB42-7XA0**
**Additional accessories**

See SIMATIC RS 485 diagnostics repeater, page 10/523

# I/O systems

## PROFIBUS components

### Diagnostics

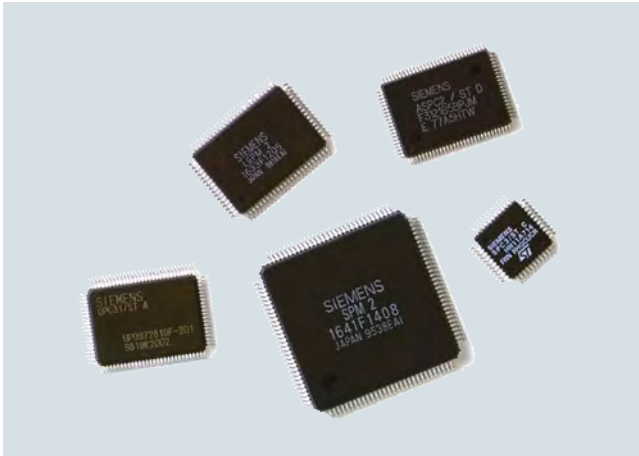
#### SIPLUS diagnostic repeater for PROFIBUS

#### Technical specifications

Article number	<b>6AG1972-0AB01-4XA0</b>
Based on	<b>6ES7972-0AB01-0XA0</b> SIPLUS Diagnose-Repeater fuer Profibus
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *

Article number	<b>6AG1972-0AB01-4XA0</b>
Based on	<b>6ES7972-0AB01-0XA0</b> SIPLUS Diagnose-Repeater fuer Profibus
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## Overview



- Easy connection of field devices to PROFIBUS
- Integrated low-power management
- Different ASICs for the different functional requirements and application areas

## Ordering data

## ASIC ASPC2

For constructing master interface modules (quantity discount)

- 6 units (lead-free)
- 66 units (lead-free)
- 660 units (lead-free)
- 4620 units (lead-free)

6ES7195-0AA05-0XA0

6ES7195-0AA15-0XA0

6ES7195-0AA25-0XA0

6ES7195-0AA35-0XA0

## ASIC LSPM2

For constructing simple slave interface modules (quantity discount)

- 330 units (lead-free)

6ES7195-0BA22-0XA0

## ASIC SPC3

For constructing intelligent DP slave interface modules (quantity discount)

- 6 units (lead-free)
- 96 units (lead-free)
- 960 units (lead-free)
- 4800 units (lead-free)
- 750 units (lead-free) (tape & reel)

6ES7195-0BD04-0XA0

6ES7195-0BD14-0XA0

6ES7195-0BD24-0XA0

6ES7195-0BD34-0XA0

6ES7195-0BD44-0XA0

## ASIC SPC3LV

For constructing intelligent DP slave interface modules (quantity discount)

- 160 units (lead-free)
- 800 units (lead-free)
- 4800 units (lead-free)
- 1000 units (lead-free) (tape & reel)

6ES7195-0BG10-0XA0

6ES7195-0BG20-0XA0

6ES7195-0BG30-0XA0

6ES7195-0BG40-0XA0

## Article No.

## DPC31 ASIC STEP B

For constructing intelligent DP slave interface modules (quantity discount)

- 60 units (lead-free)
- 300 units (lead-free)

6ES7195-0BE12-0XA0

6ES7195-0BE22-0XA0

## DPC31 ASIC STEP C1

For constructing intelligent DP slave interface modules (quantity discount)

- 6 units (lead-free)
- 66 units (lead-free)
- 660 units (lead-free)
- 4620 units (lead-free)

6ES7195-0BF02-0XA0

6ES7195-0BF12-0XA0

6ES7195-0BF22-0XA0

6ES7195-0BF32-0XA0

## ASIC SPC 4-2

For constructing intelligent DP slave interface modules (quantity discount)

- 5 units for laboratory development (lead-free)
- 160 units (lead-free, 1 tray)

6GK1588-3AA00

6GK1588-3AA15

## ASIC SIM 1-2

For connection according to IEC H1 for PROFIBUS PA with a transmission rate of 31.25 kbps

- 60 units (in tube)
- 1 000 units (tape & reel)

6GK1588-3BB02

6GK1588-3BB21

## I/O systems

### PROFIBUS components

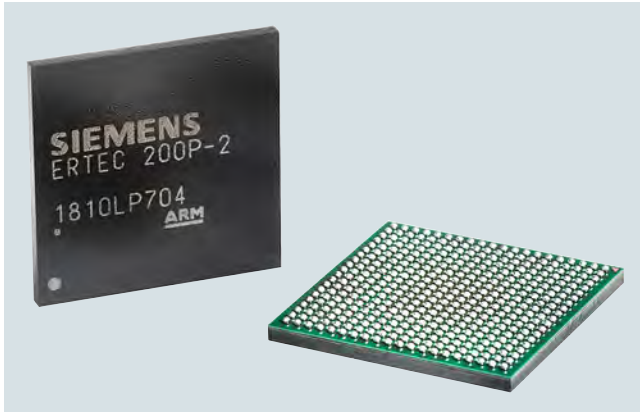
#### PROFIBUS DP ASICs

##### Technical specifications

	<b>LSPM2</b>	<b>SPC3</b>	<b>SPC3LV</b>	<b>DPC31</b>
Protocol	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP, PROFIBUS PA
Application range	simple slave application	intelligent slave application	intelligent slave application	intelligent slave application
Transmission rate, max.	12 Mbps	12 Mbps	12 Mbps	12 Mbps
Bus access	in ASIC	in ASIC	in ASIC	in ASIC
Automatic determination of transmission rate	Yes	Yes	Yes	Yes
Microprocessor required	No	Yes	Yes	integrated
Scope of firmware	not required	6 to 24 KB	6 to 24 KB	Approx. 38 KB
Message buffer	-	1.5 KB	1.5 KB	6 KB
Power supply	5 V DC	5 V DC	3.3 V DC	3.3 V DC
Power loss, max.	0.35 W	0.5 W	<0.5 W	0.2 W
Permissible ambient temperature	-40 °C to +75 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Enclosure	MQFP, 80-pin	PQFP, 44-pin	PQFP, 44-pin	PQFP, 100-pin
Frame size	4 cm <sup>2</sup>	2 cm <sup>2</sup>	2 cm <sup>2</sup>	4 cm <sup>2</sup>
Delivery quantities (pcs.)	6/66/330/4950	6/96/750/960/4800	5/160/800/1000/4800	STEP B: 6/60/300/5100 STEP C1: 6/66/660/4620

	<b>SPC 4-2</b>	<b>ASPC2</b>	<b>SIM 1-2</b>
Protocol	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS PA
Application range	Intelligent slave application	Master application	Medium Attachment
Transmission rate, max.	12 Mbps	12 Mbps	31.25 kbit/s
Bus access	in ASIC	in ASIC	-
Automatic determination of transmission rate	Yes	Yes	-
Microprocessor required	Yes	Yes	-
Scope of firmware	3 to 30 KB	80 KB	not required
Frame buffer	3 KB	1 MB (external)	-
Power supply	5 V DC, 3.3 V	5 V DC	via bus
Power loss, max.	0.6 W at 5V 0.01 W at 3.3 V	0.9 W	0.05 W
Permissible ambient temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Enclosure	TQFP, 44-pin	P-MQFP, 100-pin	MLPQ, 40-pin
Frame size	2 cm <sup>2</sup>	4 cm <sup>2</sup>	36 mm <sup>2</sup>
Delivery quantities (pcs.)	5/160	6/66/660/4620	30/60/1000

## Overview

Innovative and well-proven

As a dedicated PI member, Siemens has been actively advancing the development of PROFINET from the beginning. Siemens technology components benefit from the accumulated know-how. They have been field-proven in countless products, provide maximum performance capability and can be scaled to exact requirements.

And that is not all. Siemens Competence Centers offer advice for choosing the right technology component for the device, training opportunities and support throughout the development process, up to and including successful certification.

ERTEC 200P-2 – Your path to the fastest PROFINET

The ERTEC 200P-2 (Enhanced Real-Time Controller) sets new standards for communication.

Designed for cycle times as low as 125  $\mu$ s, the performance upgrade for PROFINET has been integrated in the ERTEC 200P-2. With its 250 MHz ARM9 CPU and integrated IRT (isochronous real-time) switch, field devices with demanding performance requirements can be implemented. The reduced chip size simplifies integration into compact field devices. The CPU also allows integration of a user's own applications, which makes an external host CPU unnecessary depending on the application.

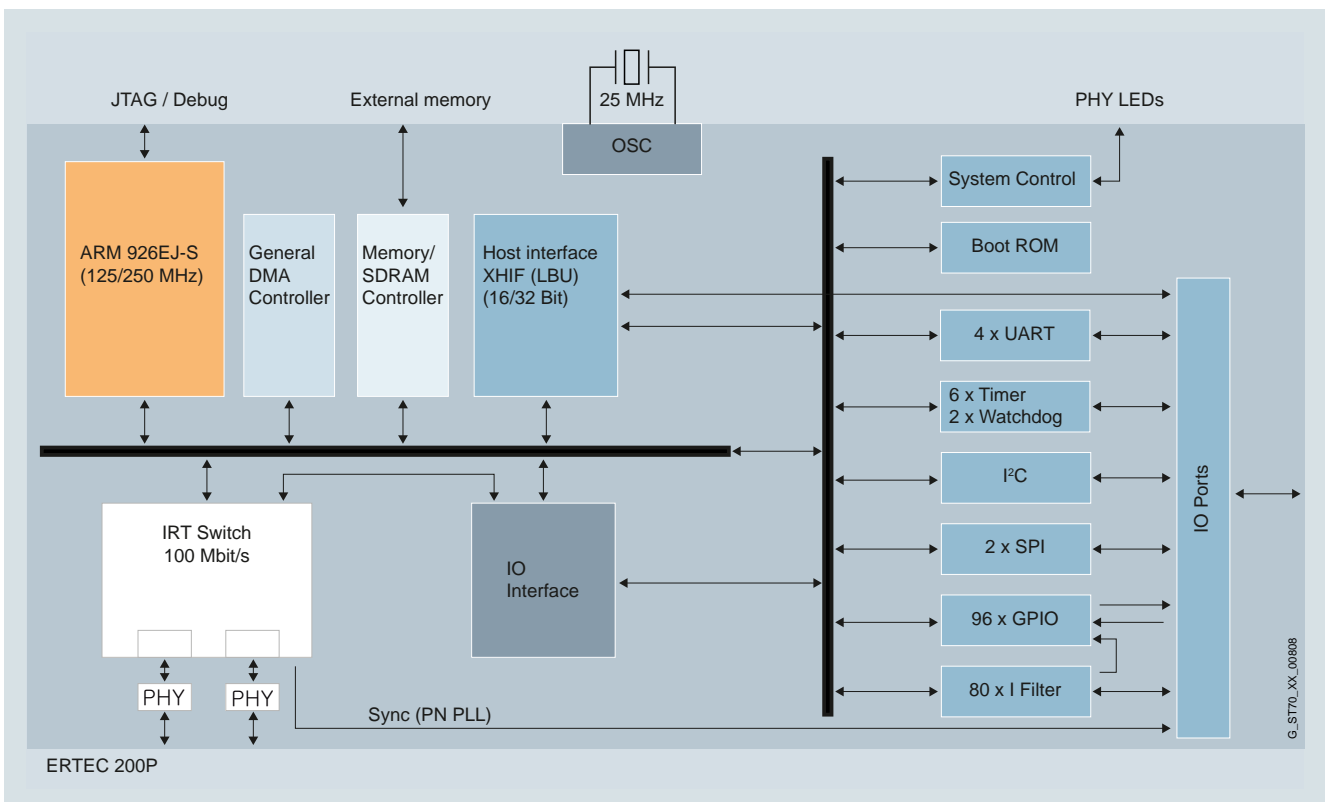
Development kit for ERTEC 200P-2

The development kit includes an evaluation board with sample applications so that commissioning can be completed in minimum time. The PROFINET stack is delivered as source code and includes the eCos open source real-time operating system and all development tools, analysis programs and documentation. Field devices with RT (real-time) and IRT (isochronous real-time) can be implemented with the ERTEC ASICs. The integrated switch allows the construction of field devices with two ports.

## Functions:

- Isochronous mode
- Shared device for 4 controllers
- S2 system redundancy
- PROFINET performance upgrade with a minimum cycle time of 125  $\mu$ s.
- MRP/MRPD
- Regular, no-cost updates
- Current technology certificate

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Internal structure of ERTEC 200P-2

**I/O systems**

## PROFINET components

**Enhanced Real-Time Ethernet Controller ERTEC****Ordering data****Article No.****ERTEC 200P-2**

ASIC for connection to switched Ethernet 100 Mbps, Ethernet controller with integrated 2-port switch, ARM 926 processor and integrated PHYs; recommended for new developments

- 10 units (evaluation pack)
- 90 units (single tray)
- 450 units (drypack, 5 trays)
- 1 000 units (tape & reel)

**6ES7195-0BH02-0XA0****6ES7195-0BH12-0XA0****6ES7195-0BH22-0XA0****6ES7195-0BH32-0XA0****EK-ERTEC 200P PN IO evaluation kit with ERTEC 200P-2****6ES7195-3BE00-0YA0****ERTEC 200P**

ASIC for connection to Switched Ethernet 100 Mbps, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs

- 10 units (evaluation pack)
- 90 units (single tray)
- 450 units (drypack, 5 trays)
- 1 000 units (tape & reel)

**6ES7195-0BH00-0XA0****6ES7195-0BH10-0XA0****6ES7195-0BH20-0XA0****6ES7195-0BH30-0XA0****ERTEC 200**

ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbps, Ethernet controller with integral 2-port switch, ARM 946 processor and integral PHYs

- 70 units (single tray)
- 350 units (drypack, 5 trays)
- 3500 units (package, 10 drypacks)
- 1050 units (tape & reel)

**6GK1182-0BB01-0AA1****6GK1182-0BB01-0AA2****6GK1182-0BB01-0AA3****6GK1182-0BB01-0AA4****ERTEC 400**

ASIC ERTEC 400 for connection to Switched Ethernet 10/100 Mbps, Ethernet controller with integrated 4-port switch, ARM 946 processor and PCI interface (V2.2), data preparation for real-time and isochronous real-time for PROFINET IO

- 70 units (single tray)
- 350 units (drypack, 5 trays)

**6GK1184-0BB01-0AA1****6GK1184-0BB01-0AA2****Technical specifications****ERTEC 200P-2**

Integrated IRT switch	2-port
Integrated PHYs	Yes
Copper and fiber-optic cable supported	Yes
Minimum cycle time	125 µs
ARM CPU	ARM 926
Clock frequency	250 MHz
Configurable IOs, general purpose IOs	96
Enclosure size	17x17 mm
Ball pitch	0.8 mm



## Overview



With the development packages for PROFINET, compact or modular PROFINET field devices can be developed quickly and with little effort. Depending on the application, different development packages are available.

The development packages for the ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller) are suitable for the development of field devices with an integrated IRT switch (Isochronous Real-Time). The demand for real-time capability, linear topology capability, and for IT integration is therefore met perfectly.

With the help of the development package for standard Ethernet controllers, PROFINET devices can be developed on the basis of a standard Ethernet controller. Devices with RT (Real-Time) can be implemented in the field device without special hardware.

The PROFIsafe starter kit permits the implementation of fail-safe devices. In so doing, the PROFIsafe stack applicatively builds on the PROFINET stack.

## Ordering data

## Article No.

**ERTEC development kits / evaluation kits**

EK-ERTEC 200P PN IO evaluation kit for ERTEC 200P-2

**6ES7195-3BE00-0YA0**

PROFIsafe starter kit V3.5 according to the PROFIsafe V2.6.1 profile

**6ES7195-3BF03-0YA0****ERTEC ASICs****ERTEC 200P-2**

ASIC for connection to Switched Ethernet 100 Mbps, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs

- 10 units (evaluation pack)
- 90 units (single tray)
- 450 units (drypack, 5 trays)
- 1 000 units (tape & reel)

**6ES7195-0BH02-0XA0****6ES7195-0BH12-0XA0****6ES7195-0BH22-0XA0****6ES7195-0BH32-0XA0****Accessories**

PROFINET IO product line license for one product line

**6ES7195-3BC10-0YA0**

## I/O systems

### PROFINET components

#### PROFINET drivers

##### Overview

###### PROFINET driver for controllers

Reasonably priced components are a major competitive advantage, especially in series machine building. Here, users often develop in-house control software. For reasons of performance, flexibility and cost, the individual application is then implemented on standard PCs. The PROFINET driver supports this in-house development and requires no special hardware thanks to its conventional Ethernet interface.

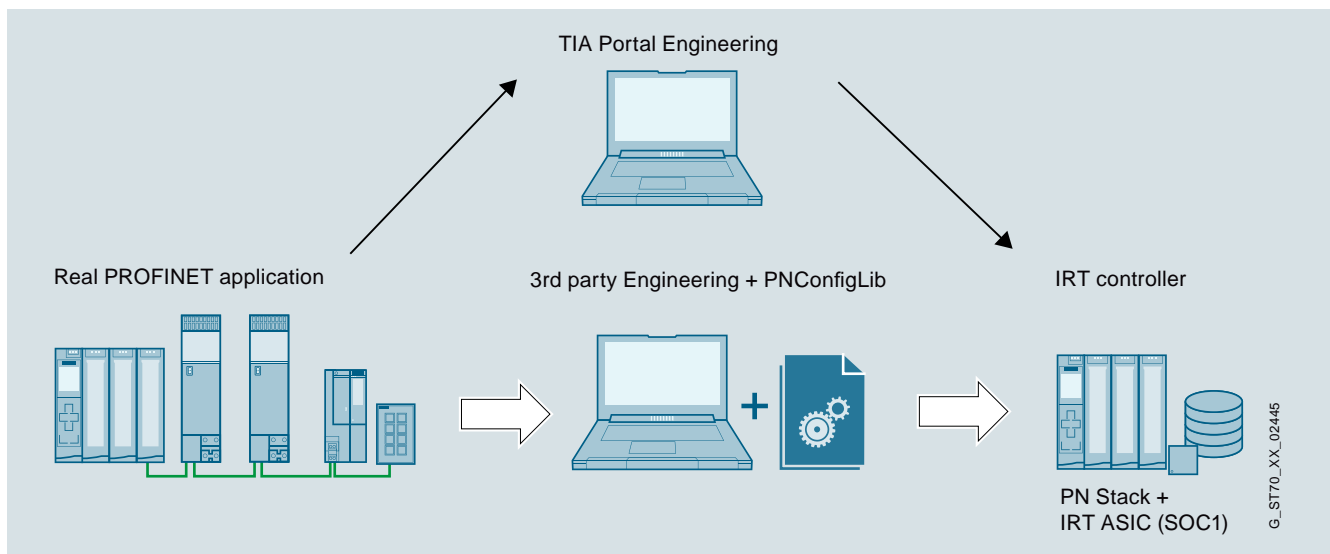
Because the PROFINET driver is delivered as source code, proprietary solutions can be ported into various operating systems and hardware platforms.

As a result, the PROFINET driver can also be optimally used in embedded systems for in-house controller solutions. Design and configuration is easy and takes place via an open XML interface without the need for engineering tools. The well-proven PROFINET stack from SIMATIC forms the centerpiece.

The PROFINET driver is suitable for both simple applications, such as individual PROFINET lines, as well as for complex machines. It supports PROFINET RT for cycle times starting from 1 ms via a standard Ethernet interface. Alternatively, PROFINET IRT can also be used for cycle times starting from 500 µs, in connection with the CP1625 controller development kit.

###### PROFINET ConfigLib

PROFINET networks must be planned. This can be carried out for the PROFINET driver using the TIA Portal. A license is not required. ConfigLib is a standalone API for generating PROFINET hardware configurations. It can be used to create RT and IRT projects, whereby ConfigLib takes over the planning algorithm.



PNConfigLib – Efficient creation of hardware configurations without the TIA Portal

###### CP1625 Controller Development Kit

Siemens SOC1 gives you the hardware support required to build an IRT controller. The CP1625 Controller Development Kit is suitable for both standalone and host modes.

- Stand-alone mode: PN stack and application run on the CP1625
- Host mode: Application runs on the PC or, for example, ARM. The stack runs on the CP1625



SIMATIC CP1625

Ordering data	Article No.
<b>PROFINET Driver V2.1</b>	
For connecting distributed I/O and drives to user-specific control applications via PROFINET	
PN Driver V2.1 development license and PN ConfigLib	<b>6ES7195-3AA00-0YA0</b>
SIMATIC CP1625 Development Board; PCIe card for PROFINET IRT	<b>6ES7648-2CF10-1BA0</b>
Runtime licenses	
• 1 unit	<b>6ES7195-3AA05-0XA0</b>
• 10 units	<b>6ES7195-3AA10-0XA0</b>
• 50 units	<b>6ES7195-3AA20-0XA0</b>
• 200 units	<b>6ES7195-3AA30-0XA0</b>
• 500 units	<b>6ES7195-3AA40-0XA0</b>

## I/O systems

Network components for PROFIBUS  
Electrical networks (RS 485)

### Active RS 485 terminating element

#### Overview



- Terminates bus segments at data transmission rates of 9.6 kbit/s to 12 Mbit/s
- Power supply independent of bus stations.

#### Designed for Industry

- Terminal-independent bus termination through onboard power supply

#### Ordering data

#### Article No.

#### Active RS 485 terminating element for PROFIBUS

6ES7972-0DA00-0AA0

For terminating bus segments at transmission rates of 9.6 kbps to 12 Mbps

#### Technical specifications

Article number	<b>6ES7972-0DA00-0AA0</b> RS485 Termin. resistor f. PROFIBUS/MPI,
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
Current consumption, typ.	30 mA
<b>Power loss</b>	
Power loss, max.	0.72 W
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Operation, max.	95 %; at +25 °C
<b>Connection method</b>	
Design of electrical connection for supply voltage	Screw terminal block
Design of electrical connection for PROFIBUS cables	Screw terminal block
<b>Dimensions</b>	
Width	60 mm
Height	70 mm
Depth	43 mm
<b>Weights</b>	
Weight, approx.	95 g

### Overview



- Automatic detection of transmission rates
- Transmission rates from 9.6 kbps to 12 Mbps are possible, incl. 45.45 kbps
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

#### Designed for Industry

- For increasing the expansion
- Galvanic isolation of segments
- Commissioning support
  - Switches for separation of segments
  - Bus activity display
  - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostics repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described in "Distributed I/O / diagnostics / diagnostics repeater for PROFIBUS DP".

### Technical specifications

Article number	<b>6ES7972-0AA02-0XA0</b> Repeater RS485 f. PROFIBUS/MPI
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
Current consumption, max.	100 mA; 100 mA without loads at PG/OP socket; 130 mA load at PG/OP socket (5 V/90 mA); 200 mA load at PG/OP socket (24 V/100 mA)
<b>Power loss</b>	
Power loss, typ.	0.7 W
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Operation, max.	95 %; at 25 °C
<b>Connection method</b>	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	2 terminal blocks
<b>Dimensions</b>	
Width	45 mm
Height	128 mm
Depth	67 mm
<b>Weights</b>	
Weight, approx.	350 g

### Ordering data

#### Article No.

#### RS 485 repeater for PROFIBUS

Transfer rate up to max. 12 Mbps,  
24 V DC, IP20 enclosure

**6ES7972-0AA02-0XA0**

## I/O systems

Network components for PROFIBUS  
Electrical networks (RS 485)

### SIPLUS DP active RS 485 terminating element

#### Overview



- Used to terminate bus segments at rates of 9.6 kbps to 12 Mbps
- Power supply independent of the bus participants

#### **Designed for Industry**

- End-device independent bus termination thanks to own power supply

#### **Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

#### Ordering data

##### **SIPLUS active RS 485 terminating element for PROFIBUS**

To terminate bus segments at transmission rates of 9.6 kbps to 12 Mbps

Extended temperature range and exposure to environmental substances

#### Article No.

**6AG1972-0DA00-2AA0**

#### Technical specifications

Article number	<b>6AG1972-0DA00-2AA0</b>
Based on	<b>6ES7972-0DA00-0AA0</b> SIPLUS Profibus Terminator
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1972-0DA00-2AA0</b>
Based on	<b>6ES7972-0DA00-0AA0</b> SIPLUS Profibus Terminator
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
<b>Connection method</b>	
Design of electrical connection for supply voltage	Screw terminal block
Design of electrical connection for PROFIBUS cables	Screw terminal block
<b>Dimensions</b>	
Width	60 mm
Height	70 mm
Depth	43 mm
<b>Weights</b>	
Weight, approx.	95 g

## I/O systems

Network components for PROFIBUS  
Electrical networks (RS 485)

### SIPLUS RS 485 repeater

#### Overview



- Automatically detects transmission rate
- 45.45 kbps transmission rate is possible
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

#### Designed for Industry

- For increasing the number of participants and the expansion
- Electric isolation of segments
- Commissioning support
  - Segment separation switch
  - Bus activity display
  - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostics repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described in "Distributed I/O / diagnostics / diagnostics repeater for PROFIBUS DP".

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

#### Ordering data

##### SIPLUS RS 485 repeater for PROFIBUS

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

Extended temperature range and  
exposure to environmental  
substances

#### Article No.

**6AG1972-0AA02-7XA0**



#### Technical specifications

Article number	<b>6AG1972-0AA02-7XA0</b>
Based on	<b>6ES7972-0AA02-0XA0</b> SIPLUS DP RS485-Repeater
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1972-0AA02-7XA0</b>
Based on	<b>6ES7972-0AA02-0XA0</b> SIPLUS DP RS485-Repeater
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
<b>Connection method</b>	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	2 terminal blocks
<b>Dimensions</b>	
Width	45 mm
Height	128 mm
Depth	67 mm
<b>Weights</b>	
Weight, approx.	350 g

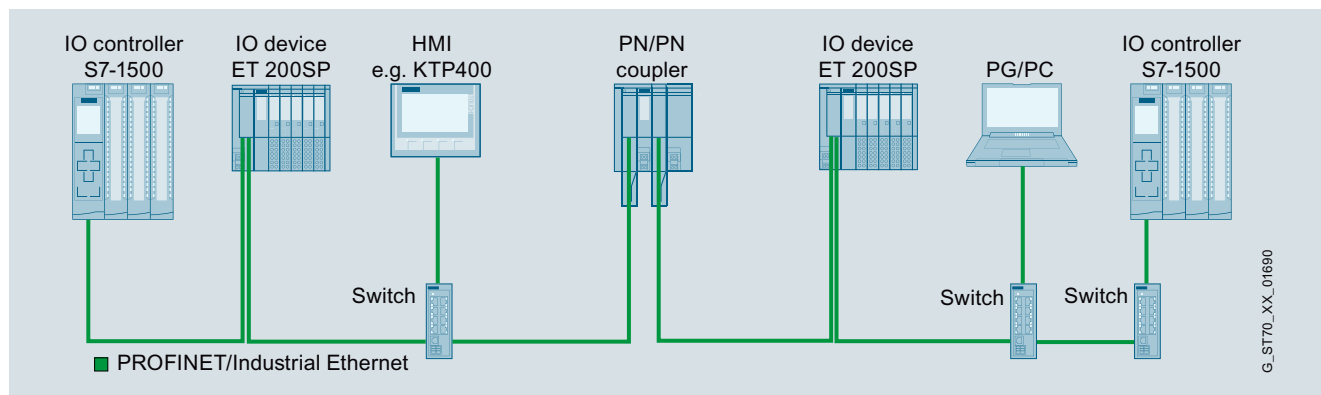
## I/O systems

### Network transitions

#### PN/PN couplers

##### Overview

- Fast deterministic data exchange between CPUs with PROFINET controller, even beyond network boundaries
- Configuration with two PROFINET devices completely independent of the communication technology



Data transmission between two S7-1500 IO controllers beyond a PROFINET limit

- Very simple configuration of the data exchange via virtual IO modules or alternatively via data records for larger amounts of data
- Simultaneous data transfer to up to 3 CPUs on own network side and/or up to 4 CPUs on opposite network side
- Easy to integrate into any PROFINET network with 2 ports per network side
- Fieldbus connection via a SIMATIC BusAdapter; this allows free selection of the connection system (RJ45, FC cable direct connection) and connection hardware (copper, POF, PCF, glass fiber). FO-to-copper media conversion can also be realized economically and without external converters.
- Firmware update
- Support for Ethernet services (ping, arp, SNMP, MIP-2, LLDP)
- Comprehensive diagnostics via LED displays and interrupts
- Extensive compatibility with the PN/PN coupler up to firmware version V3.0

##### Additional functions

- Quantity structures
  - Cyclic transmission: Up to 1 440 bytes each for input and output data
  - Data record transfer: Up to 4 096 bytes per slot. Buffering of up to eight data records per slot
  - Maximum 16 input/output areas for data exchange
  - Max. 254 bytes of input and 253 bytes of output data per module
- Exchange of fail-safe data between two F-CPU's via F-SendDP and F\_ReceiveDP
- Shared device with up to four IO controllers per network side
- Module-internal shared input / shared output (MSI/MSO)
- Device replacement without programming device
  - With topological configuration via proximity detection (LLDP)
  - Without topological configuration via redundant storage of the station name in the BusAdapter. A separate removable memory card is not required.
- Reset button for restoring the factory settings
- Redundant power supply
- Galvanic isolation between the two PROFINET IO subnets
- Media redundancy (MRP and MRPD)
- I&M data

Ordering data	Article No.	Article No.
<b>PN/PN coupler</b> For deterministic data exchange between max. 4 PN controllers per side, also beyond network boundaries Transfer of PROFI-safe, I/O, MSI, MSO and data record communication, redundant power supply PN connection via SIMATIC BusAdapter (BA) Delivery without BusAdapter	<b>6ES7158-3AD10-0XA0</b>	<b>BA 2XLC BusAdapter</b> PROFINET BusAdapter; 2 glass fiber-optic connections
<b>Accessories</b>		<b>BA LC/RJ45 BusAdapter</b> PROFINET BusAdapter; with media converter glass FO-CU; 1 x LC connection, 1 x RJ45 connection
<b>DIN rail 35 mm</b> • Length: 483 mm for 19" cabinets • Length: 530 mm for 600 mm cabinets • Length: 830 mm for 900 mm cabinets • Length: 2 m	<b>6ES710-8MA11</b> <b>6ES710-8MA21</b> <b>6ES710-8MA31</b> <b>6ES710-8MA41</b>	<b>BA LC/FC BusAdapter</b> PROFINET BusAdapter; with media converter glass FO-CU; 1 x LC connection, 1 x FastConnect connection for direct connection of the bus cable
<b>BusAdapter BA 2xRJ45</b> PROFINET BusAdapter with standard Ethernet socket	<b>6ES7193-6AR00-0AA0</b>	<b>Reference identification label</b> 10 sheets of 16 labels each
<b>BusAdapter BA 2xFC</b> PROFINET BusAdapter with FastConnect Ethernet connection; for increased vibration and EMC load capacity	<b>6ES7193-6AF00-0AA0</b>	<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer
<b>BusAdapter BA 2xSCRJ</b> PROFINET BusAdapter with fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	<b>6ES7193-6AP00-0AA0</b>	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer
<b>BusAdapter BA SCRJ/RJ45</b> PROFINET BusAdapter; with media converter FO-Cu; 1 x SCRJ FO connection, 1 x RJ45 connection	<b>6ES7193-6AP20-0AA0</b>	1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer
<b>BusAdapter BA SCRJ/FC</b> PROFINET BusAdapter; with media converter FO-Cu; 1 x SCRJ FO connection, 1 x FastConnect connection for direct connection of the bus cable	<b>6ES7193-6AP40-0AA0</b>	1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer
		<b>Spare parts</b>
		<b>Cover for bus adapter interface</b> 5 units
		<b>Power supply connector</b> For connecting the 24 V DC supply voltage • With push-in terminals • With screw-type terminals
		<b>6ES7193-6AG00-0AA0</b> <b>6ES7193-6AG20-0AA0</b> <b>6ES7193-6AG40-0AA0</b> <b>6ES7193-6LF30-0AW0</b> <b>6ES7193-6LR10-0AA0</b> <b>6ES7193-6LR10-0AG0</b> <b>6ES7193-6LA10-0AA0</b> <b>6ES7193-6LA10-0AG0</b> <b>6ES7591-3AA00-0AA0</b> <b>6ES7193-4JB00-0AA0</b> <b>6ES7193-4JB50-0AA0</b>

## Technical specifications

Article number	6ES7158-3AD10-0XA0	Article number	6ES7158-3AD10-0XA0
	SIMATIC PN/PN Coupler		SIMATIC PN/PN Coupler
<b>General information</b>		<b>Engineering with</b>	
Product type designation	PN/PN coupler	• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V15.1 or higher
<b>Product function</b>		• PROFINET from GSD version/ GSD revision	V2.3
• I&M data	Yes; I&M0 to I&M3	<b>Installation type/mounting</b>	
• Isochronous mode	No; For operation on isochronous bus	Mounting	Mounting rail 7.5 mm and 15 mm
• Tool changer	Yes; Docking station and docking unit	<b>Supply voltage</b>	
• Local coupling, IO data	Yes	Rated value (DC)	24 V
- Number of coupling modules	16	Reverse polarity protection	Yes
- Number of coupling submodules per module	4; 1x write, 3x read	<b>Mains buffering</b>	
• Local coupling, data records	Yes	• Mains/voltage failure stored energy time	10 ms
- Number of coupling modules	16	<b>Input current</b>	
- Number of coupling submodules per module	4; 1x write, 3x read	Current consumption, max.	360 mA; For 19.2 V input voltage at the right-hand supply terminal, including 2 plugged BA 2x LC
- Record length, max.	4 096 byte	from supply voltage 1L+, max.	320 mA; For 19.2 V input voltage at the left-hand supply terminal, including 2 plugged BA 2x LC
- FIFO depth in storage mode	8		

## I/O systems

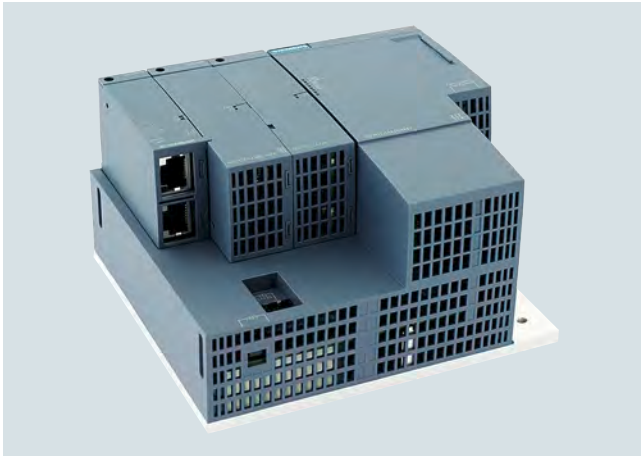
### Network transitions

#### PN/PN couplers

#### Technical specifications

Article number	<b>6ES7158-3AD10-0XA0</b> SIMATIC PN/PN Coupler
<b>Power loss</b>	
Power loss, typ.	4 W; For 24 V input voltage and 2 plugged BA 2x RJ45 If BusAdapters with an optical interface are plugged, there is an additional 750 mW per optical interface (3 W with 2 plugged BA 2x LC)
<b>Address area</b>	
<b>Address space per module</b>	
• Address space per module, max.	254 byte; max. 254 bytes of input data and 253 bytes of output data
<b>Address space per station</b>	
• Address space per station, max.	1 440 byte; per input / output
<b>Hardware configuration</b>	
<b>Submodules</b>	
• Number of submodules per station, max.	116
<b>Interfaces</b>	
Number of PROFINET interfaces	2; One PROFINET interface per line side
Optical interface	Yes; Via SIMATIC BusAdapter
Transmission rate, max.	100 Mbit/s
<b>1. Interface</b>	
<b>Interface types</b>	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC
<b>Protocols</b>	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
<b>2. Interface</b>	
<b>Interface types</b>	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
<b>Protocols</b>	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
<b>Interface types</b>	
<b>RJ 45 (Ethernet)</b>	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	No
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
<b>Protocols</b>	
Supports protocol for PROFINET IO	Yes
<b>Protocols (Ethernet)</b>	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes

Article number	<b>6ES7158-3AD10-0XA0</b> SIMATIC PN/PN Coupler
<b>PROFINET IO Device</b>	
<b>Services</b>	
- IRT	Yes
- PROFIenergy	No
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4; per line side
<b>Redundancy mode</b>	
• PROFINET system redundancy (S2)	Yes; NAP S2 acc. to IEC
• H-Sync forwarding	Yes
<b>Media redundancy</b>	
- MRP	Yes
- MRPD	Yes
<b>Open IE communication</b>	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
<b>Interrupts/diagnostics/status information</b>	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes; Parameterizable
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• LINK LED	Yes; 2x green link LEDs on BusAdapter
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
<b>Potential separation</b>	
between supply voltage and electronics	Yes; to power input 2
between Ethernet and electronics	Yes
<b>Standards, approvals, certificates</b>	
Security level	According to Security Level 1 Test Cases V1.1.4
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-30 °C; From FS05
• max.	60 °C; = Tmax for horizontal installation; for vertical installation Tmax = 50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see section "Climatic and mechanical environmental conditions"
<b>Mechanics/material</b>	
Strain relief	Yes; Optional, for RJ45 and FC BusAdapter only
<b>Dimensions</b>	
Width	100 mm; Minimized with good handling
Height	117 mm
Depth	74 mm; with mounting rail
<b>Weights</b>	
Weight, approx.	200 g; without BusAdapter

**Overview**

The Power Line Booster system is a communication system for general data transmission on conductive media. It enables Ethernet-based communication links between stationary system controls and mobile plant units. The transmission media can be sliding contact systems (graphite/copper on copper) such as in electric monorail conveyors or flexible cables such as the ones used in crane systems as well as slip ring transmitters. The Power Line Booster is designed for operation in industrial environments and supports the use of the proven SIMATIC PROFINET automation components on mobile plant units.

## I/O systems

Network transitions  
Power Line Booster

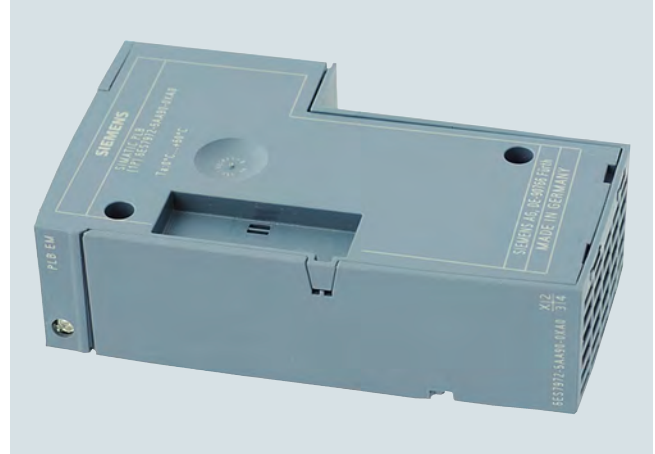
### Communications modules

#### Overview



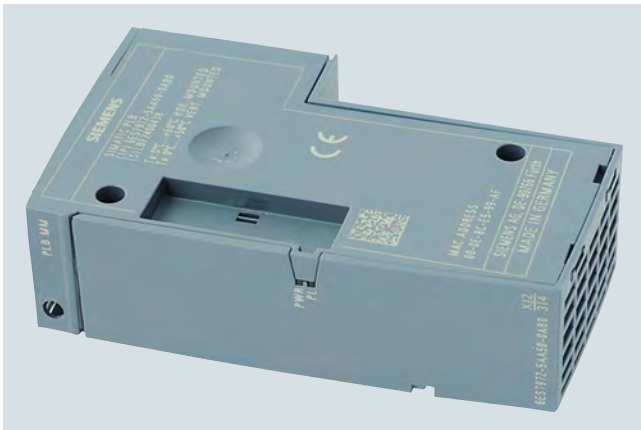
SIMATIC PLB BM LV M/S

- SIMATIC PLB BM LV M/S basic module; for accommodating
  - the Power Line Booster modem module,
  - the empty module and
  - the BusAdapter module RJ-45 ET 200SP BA 2xRJ45 or BusAdapter FastConnect ET 200SP BA 2xFC



SIMATIC PLB EM

- SIMATIC PLB EM empty module; to cover the module bay and the DIP switches of the PLB BM



SIMATIC PLB MM

- SIMATIC PLB MM modem module; modulates or demodulates the Ethernet data frames into a form that is suitable for the "Powerline" transmission medium (e.g. sliding contact lines).

#### Ordering data

#### Article No.

#### Article No.

##### SIMATIC PLB BM LV M/S basic module

6ES7972-5AA10-0AB0

To accommodate the Power Line Booster modem module, the empty module and the BusAdapter module RJ-45 ET 200SP BA 2xRJ45 or BusAdapter FastConnect ET 200SP BA 2xFC

##### SIMATIC PLB MM modem module

6ES7972-5AA51-0AB0

Modulates or demodulates the Ethernet data frames into a form that is suitable for the "Powerline" transmission medium (e.g. sliding contact lines).

##### SIMATIC PLB EM empty module

6ES7972-5AA80-0XA0

to cover the module bay and the DIP switches of the PLB BM

**Overview**

- SIMATIC PLB TC termination module; to terminate both ends of the communication cable of a segment
- SIMATIC PLB connection cable; the connection cables in a powerline system have a strong impact on the signal attenuation and cause poles in the frequency range used. This is why the selection of cables also has an effect on the maximum configuration limit. The PLB connection cable, with a length of 8 m, is optimized for PLB use. The following are available:
  - Connection cable without plug, length 8 m
  - Connection cable with plug at one end, length 8 m
  - Connection cable with 2 plugs

**Ordering data**
**Article No.**
**SIMATIC PLB TC termination module**
**6ES7972-5AB00-0XA0**

To terminate both ends of the communication cable of a segment

**SIMATIC PLB connecting cable**

Length 8 m

- Without a plug
- With a plug on one side
- With two plugs

**6ES7903-1AH40-0AB0**
**6ES7903-1AH41-0AB0**
**6ES7903-1AH42-0AB0**

**I/O systems**

## Network transitions

**PN/CAN LINK****Overview**

- For data exchange between PROFINET and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
  - Node / lifeguarding
  - Heartbeat
  - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V14 or higher
- PROFINET switch and 9-pin D-sub plug integrated for CAN
- Up to 126 CAN nodes
- 512 receiver/transmitter PDOs
- Electrical isolation between the two networks
- Diagnostic interrupts
- Supported controllers: S7-1200, S7-1500, ET 200SP, Open Controller
- Optionally with function block SIMATIC ECC CHAdeMO: Realization of digital communication as basis for conductible DC charging of electric vehicles in line with the CHAdeMO standard

**Ordering data****SIMATIC PN/CAN LINK**

PROFINET network transition according to CAN Bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302; IP20

**Article No.****6BK1620-0AA00-0AA0****Article No.****Accessories****Function block  
SIMATIC ECC CHAdeMO**

For realization of digital communication between a DC charging station and an electric vehicle according to CHAdeMO 1.x-2.0 specification; can be used with TIA Portal as of V15.1; Single license

**6FE1263-8FB10-0AA0****Technical specifications**

Article number	<b>6BK1620-0AA00-0AA0</b> SIMATIC PN/CAN LINK
<b>General information</b>	
Product type designation	PN/CAN Link
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V14 or higher
<b>Installation type/mounting</b>	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
<b>Mains buffering</b>	
• Mains/voltage failure stored energy time	10 ms

Article number	<b>6BK1620-0AA00-0AA0</b> SIMATIC PN/CAN LINK
<b>Input current</b>	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
<b>Power loss</b>	
Power loss, typ.	2.2 W
<b>Interfaces</b>	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
<b>Supports protocol for PROFINET IO</b>	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
<b>PROFINET functions</b>	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes



## Technical specifications

Article number	<b>6BK1620-0AA00-0AA0</b> SIMATIC PN/CAN LINK
<b>CAN</b>	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	50 kbit/s
• Transmission rate, max.	1 000 kbit/s
• Number of slaves, max.	126
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	512; Send / receive
<b>Services</b>	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes
<b>1. Interface</b>	
Interface type	CAN according to CiA 303-1
Isolated	Yes; 500 V AC or 707 V DC
<b>Interface types</b>	
• Number of ports	1
• Design of the connection	9-pin sub D socket
<b>2. Interface</b>	
Isolated	Yes; 1 500 V AC or 2 250 V DC
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
<b>Protocols</b>	
• PROFINET IO Device	Yes
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes

Article number	<b>6BK1620-0AA00-0AA0</b> SIMATIC PN/CAN LINK
<b>Potential separation</b>	
Potential separation exists	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
<b>Marine approval</b>	
• Germanischer Lloyd (GL)	Yes
• American Bureau of Shipping (ABS)	Yes
• Bureau Veritas (BV)	Yes
• Nippon Kaiji Kyokai (Class NK)	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	85 °C
<b>Relative humidity</b>	
• Operation, max.	95 %
<b>Software</b>	
<b>Runtime software</b>	
<b>Target system</b>	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
<b>Dimensions</b>	
Width	70 mm
Height	112 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	212 g

## I/O systems

### Network transitions

#### SIPLUS PN/CAN LINK

##### Overview



- For data exchange between PROFINET and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
  - Node / lifeguarding
  - Heartbeat
  - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V14 or higher
- PROFINET switch and 9-pin D-sub plug integrated for CAN
- Up to 126 CAN nodes
- 512 receiver/transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- PLCs supported: S7-1200, S7-1500, ET 200SP, Open Controller

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

##### Ordering data

**SIPLUS PN/CAN Link**

PROFINET network transition according to CAN Bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302; IP20

Ambient temperature  
-40 ... +70 °C (+85 °C for 10 min.)

##### Article No.

**6AG1620-0AA00-7AA0**

## Technical specifications

Article number	<b>6AG1620-0AA00-7AA0</b>
Based on	<b>6BK1620-0AA00-0AA0</b> SIPLUS PN/CAN LINK
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	85 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Available soon
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	<b>6AG1620-0AA00-7AA0</b>
Based on	<b>6BK1620-0AA00-0AA0</b> SIPLUS PN/CAN LINK
<b>Use on ships/at sea</b>	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

## I/O systems

### Network transitions

#### PN/J1939 LINK

##### Overview



- For data exchange between PROFINET and SAE J1939 networks
- J1939 functions:
  - Broadcast Announce Message (BAM)
  - Connection Mode Data Transfer (CMDT)
  - PDU 1 & 2
- Integrated into Totally Integrated Automation via gsdml file in TIA Portal. No separate software required
- Integrated PROFINET switch with 9-pin Sub-D socket for J1939
- Up to 253 logical nodes
- Up to 30 addressable ECUs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

##### Ordering data

###### SIMATIC PN/J1939 LINK

Network transition from PROFINET to J1939 networks; IP20

**6BK1623-0AA00-0AA0**

##### Technical specifications

Article number	<b>6BK1623-0AA00-0AA0</b> SIMATIC PN/J1939 LINK
<b>General information</b>	
Product type designation	PN/J1939 LINK
<b>Product function</b>	
• I&M data	Yes
• Isochronous mode	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V14 SP1 or higher
<b>Installation type/mounting</b>	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Oversvoltage protection	Yes
Short-circuit protection	Yes
<b>Mains buffering</b>	
• Mains/voltage failure stored energy time	10 ms; PN side
<b>Input current</b>	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
<b>Power loss</b>	
Power loss, typ.	2.2 W
<b>Interfaces</b>	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
<b>Supports protocol for PROFINET IO</b>	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
<b>PROFINET functions</b>	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
<b>CAN</b>	
• CAN operating modes	J1939 according to the standard "SAE J1939"
• Transmission rate, min.	100 kbit/s
• Transmission rate, max.	500 kbit/s
• Number of slaves, max.	30
<b>J1939</b>	
• Addressable ECUs, max.	30
• Logical nodes, max.	253
• PDU 1	Yes
• PDU 2	Yes
• DM data	Yes
• BAM	Yes
• CMDT	Yes

## Technical specifications

Article number	<b>6BK1623-0AA00-0AA0</b> SIMATIC PN/J1939 LINK
<b>1. Interface</b>	
Interface type	J1939 according to the standard "SAE J1939"
Isolated	Yes; 500 V AC or 707 V DC
<b>Interface types</b>	
• Number of ports	1
• Design of the connection	9-pin sub D socket
<b>2. Interface</b>	
Isolated	Yes; 1 500 V AC or 2 250 V DC
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
<b>Protocols</b>	
• PROFINET IO Device	Yes
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
<b>Potential separation</b>	
Potential separation exists	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
<b>Marine approval</b>	
• Germanischer Lloyd (GL)	Yes
• Det Norske Veritas (DNV)	Yes
• Nippon Kaiji Kyokai (Class NK)	Yes

Article number	<b>6BK1623-0AA00-0AA0</b> SIMATIC PN/J1939 LINK
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	85 °C
<b>Relative humidity</b>	
• Operation, max.	95 %
<b>Software</b>	
<b>Runtime software</b>	
<b>Target system</b>	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
<b>Dimensions</b>	
Width	70 mm
Height	112 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	212 g

**I/O systems**

## Network transitions

**PN/BACnet LINK****Overview**

- Gateway between PROFINET and BACnet/IP networks according to EN ISO16484-5 and Addendum ANSI/ASHRAE Standard 135-2012.
- Integrated in Totally Integrated Automation via HSP, TIA Portal V14 or higher
- Integrated PROFINET switch and RJ45 socket for BACnet
- 1 000 BACnet objects/object references
- 1 000 subscribe services
- BACnet features:
  - Client & Server
  - Device profile: B-GW
  - Change of value / cyclic and acyclic data exchange
  - Scan of BACnet/IP network
- Supported BACnet object types:
  - Device
  - Binary input
  - Binary output
  - Analog input
  - Analog output
- Supported BACnet services:
  - DS-COV-A/B
  - DM-DDB-A/B
  - DM-DOB-B
  - DS-RP-A/B
  - DS-WP-A/P
  - GW-EO-B
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

**Ordering data****Article No.****SIMATIC PN/BACnet LINK****6BK1621-0AA00-0AA0**

Network transition of PROFINET to BACnet/IP networks, device profile B-GW, IP20

**Technical specifications**

Article number	<b>6BK1621-0AA00-0AA0</b> SIMATIC PN/BACnet LINK
<b>General information</b>	
Product type designation	PN/BACnet Link
<b>Product function</b>	
• I&M data	Yes
• Isochronous mode	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	V14 SP1
<b>Installation type/mounting</b>	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Oversvoltage protection	Yes
Short-circuit protection	Yes
<b>Mains buffering</b>	
• Mains/voltage failure stored energy time	10 ms
<b>Input current</b>	
Current consumption (rated value)	0.11 A
Current consumption, max.	0.13 A
<b>Power loss</b>	
Power loss, typ.	2.7 W
<b>Interfaces</b>	
<b>Supports protocol for PROFINET IO</b>	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
<b>PROFINET functions</b>	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
<b>BACnet</b>	
• BACnet device profile	B-GW
• Supported character sets	ISO 10646 (UTF-8)
• Network Security	No
• Number of BACnet objects/object references	1 000
• Number of subscription services	1 000
<b>1. Interface</b>	
Interface type	BACnet/IP
Isolated	Yes; 1 500 V AC or 2 250 V DC
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
• Number of ports	1

## Technical specifications

Article number	<b>6BK1621-0AA00-0AA0</b> SIMATIC PN/BACnet LINK
<b>2. Interface</b>	
Isolated	Yes; 1 500 V AC or 2 250 V DC
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
<b>Protocols</b>	
• PROFINET IO Device	Yes
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
<b>Potential separation</b>	
Potential separation exists	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
PNO certificate	Yes
BTL certificate	Yes
RoHS conformity	Yes

Article number	<b>6BK1621-0AA00-0AA0</b> SIMATIC PN/BACnet LINK
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	85 °C
<b>Relative humidity</b>	
• Operation, max.	95 %
<b>Software</b>	
<b>Runtime software</b>	
<b>Target system</b>	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
<b>Connection method</b>	
Design of electrical connection	Screw connection
<b>Dimensions</b>	
Width	70 mm
Height	112 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	210 g

**I/O systems**

## Network transitions

**PN/M-Bus LINK****Overview**

- For data exchange between PROFINET and M-Bus networks
- M-Bus functions:
  - M-Bus master
  - Primary address
  - Secondary address
  - Read-only access to M-Bus slaves
  - Short-circuit detection
- Integrated into Totally Integrated Automation via gsdml file in TIA Portal. No separate software required
- Integrated PROFINET switch with 3-pin screw terminal for M-Bus
- Up to 40 slaves (loads/units)
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

**Ordering data****Article No.****SIMATIC PN/M-Bus LINK****6BK1622-0AA00-0AA0**

PROFINET gateway to M-Bus networks; M-Bus master, IP20

**Technical specifications**

Article number	<b>6BK1622-0AA00-0AA0</b> SIMATIC PN/M-Bus LINK
<b>General information</b>	
Product type designation	PN/M-Bus LINK
<b>Product function</b>	
• I&M data	Yes
• Isochronous mode	No
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V15 or higher
<b>Installation type/mounting</b>	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Oversvoltage protection	Yes
Short-circuit protection	Yes
<b>Mains buffering</b>	
• Mains/voltage failure stored energy time	10 ms; PN side
<b>Input current</b>	
Current consumption (rated value)	0.11 A; At 24 V and 5 loads
Current consumption, max.	0.4 A; At 20.4 V, 40 loads + 100 mA short-circuit current
<b>Power loss</b>	
Power loss, typ.	2.4 W
<b>Interfaces</b>	
<b>Supports protocol for PROFINET IO</b>	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2



## Technical specifications

Article number	<b>6BK1622-0AA00-0AA0</b> SIMATIC PN/M-Bus LINK
<b>PROFINET functions</b>	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
<b>M-Bus</b>	
• Bus voltage, typ.	36 V
• Transmission rate, min.	300 bit/s
• Transmission rate, max.	9 600 bit/s
• Number of slaves, max.	40
• Short-circuit detection	Yes
• short-circuit proof	Yes
• Connectable conductor cross-section	1.5 mm <sup>2</sup>
• Cable length, max.	300 m
<b>1. Interface</b>	
Interface type	M-Bus master
Isolated	No
<b>Interface types</b>	
• Number of ports	1
• Design of the connection	3-wire screw-type terminal
<b>2. Interface</b>	
Isolated	Yes; 1 500 V AC or 2 250 V DC
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
<b>Protocols</b>	
• PROFINET IO Device	Yes
<b>Interrupts/diagnostics/status information</b>	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes

Article number	<b>6BK1622-0AA00-0AA0</b> SIMATIC PN/M-Bus LINK
<b>Potential separation</b>	
Potential separation exists	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
RoHS conformity	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Operation, max.	95 %
<b>Software</b>	
<b>Runtime software</b>	
<b>Target system</b>	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
<b>Dimensions</b>	
Width	70 mm
Height	112 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	215 g

**I/O systems**

## Network transitions

**DP/DP couplers****Overview**

- For interconnecting two PROFIBUS DP networks
- The interchange of data between both DP networks takes place by internal copying in the coupler

**Ordering data****Article No.****DP/DP coupler****6ES7158-0AD01-0XA0**

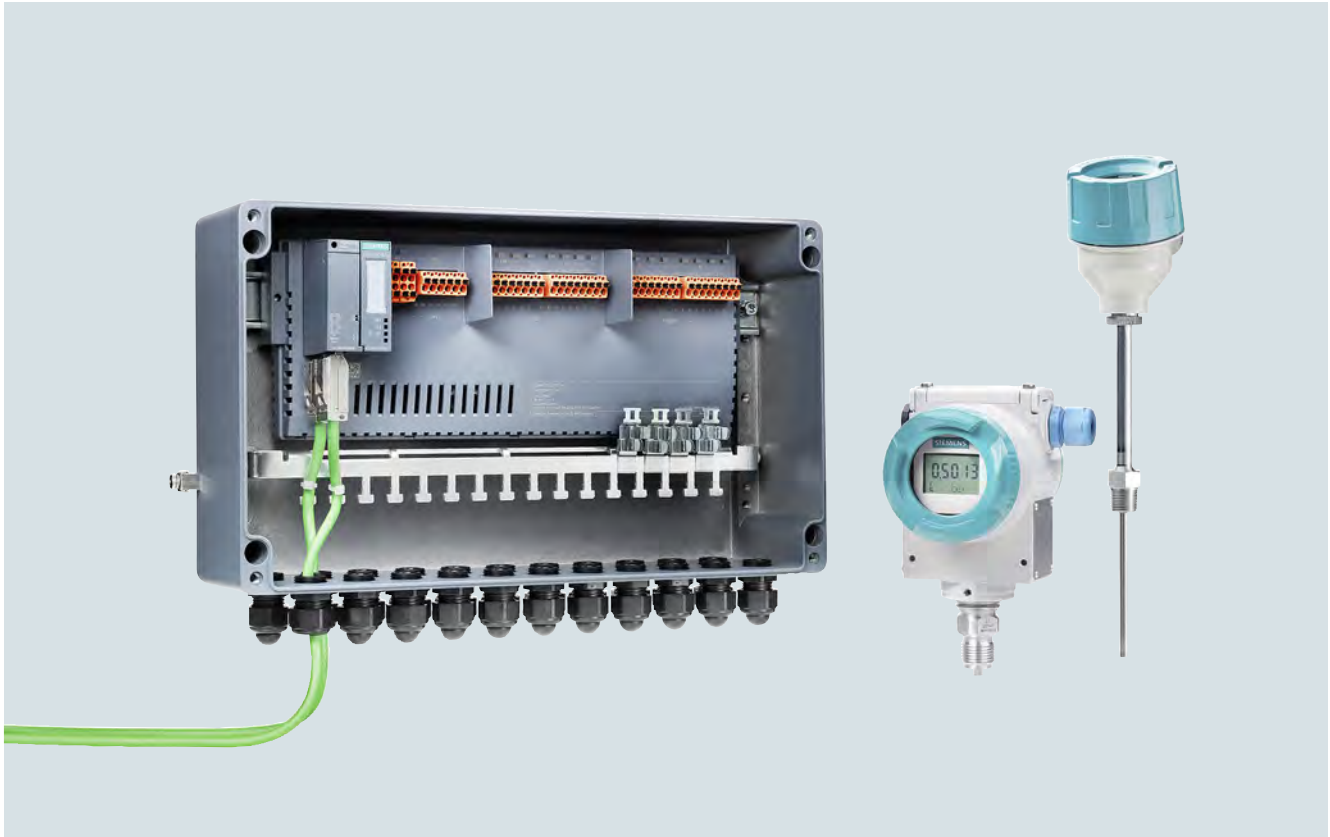
Note:

The manual is available free on the Internet.

**Technical specifications**

<b>DP/DP transceiver</b>	
PROFIBUS transmission rate	max. 12 Mbit/s
Interfaces	• PROFIBUS DP
Supply voltage	24 V DC
Current consumption typ.	150 mA
Mounting	Upright (DIP switches above)
Perm. environmental conditions	
• Operating temperature	
- horizontal mounting	0°C ... +60°C
- all other mounting positions	0°C ... +40°C
• Transport/storage temperature	-40 °C ... +70 °C
• Relative humidity	10-95 % at +25 °C
Design	
• Dimensions (W x H x D) in mm	40 x 127 x 117
• Weight	approx. 250 g
Degree of protection	IP20

## Overview

**Smart Field Distributor – SIMATIC Compact Field Unit**

Digitalization is an important catalyst for the process industry. When developing SIMATIC PCS 7 V9.0 the emphasis was placed on a forward-looking approach encompassing potential digitalization down to the field level.

The system solution was therefore expanded with special high-performance and compact hardware products that support PROFINET – the world's leading Industrial Ethernet standard – and create more freedom for plant layout and operation. With the SIMATIC Compact Field Unit (CFU), we are re-interpreting the conventional approach to field device connection. You benefit from more flexibility and easier handling, coupled with maximum availability. This allows you to efficiently transfer your familiar system concept to the digital world.

**Today's challenges for field device connection:**

- High overhead for device integration and replacement
- Complicated, error-prone wiring and routing over multiple levels, making the hardware FAT very complex
- Extremely long copper cables and numerous terminal points in the field
- Multiple individual control cabinets
- Large numbers of different components and protocols necessitate costly spare parts inventories and training sessions
- High planning and documentation costs

## I/O systems

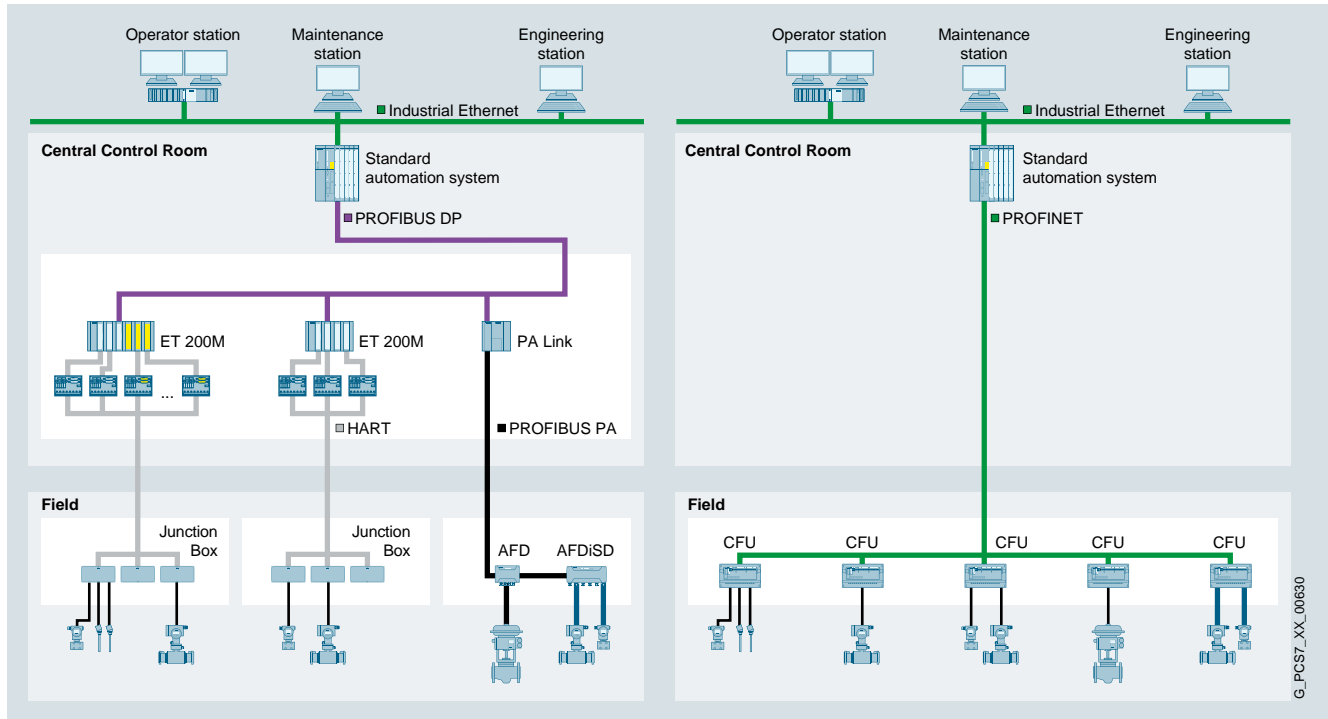
### Network transitions

#### SIMATIC CFU

##### Overview

##### *SIMATIC CFU – The answer to these challenges*

##### Mode of operation



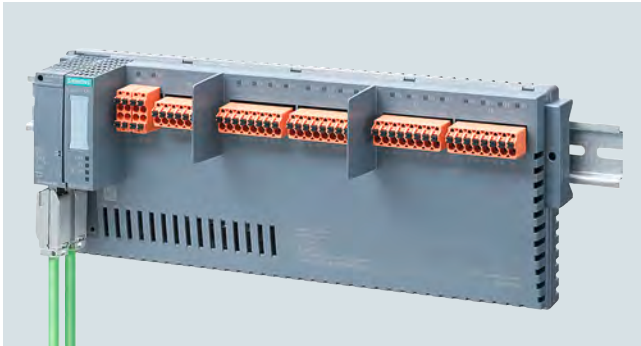
Field device connection with previous technology (left) and with SIMATIC CFU (right)

The SIMATIC Compact Field Unit (CFU) is a real game-changer in field device connection and offers you entirely new prospects regarding simplicity and flexibility. The compact field distributor is installed at the process level and is connected via PROFINET directly to the process control system to form the foundation for digitalization in the field. Utilization of digital fieldbus communication considerably simplifies device interfacing compared to conventional 4 ... 20 mA engineering.

##### Greater flexibility thanks to consistent decentralization

Distributed installation of the SIMATIC CFU means that classic control cabinets are no longer required and you can make considerable savings in cabling and the number of terminal points, as well as reducing planning and documentation overheads. The high granularity (16 I/O per SIMATIC CFU) enables flexible assignment to the higher-level controllers.

## Overview



SIMATIC CFU here with BusAdapter, PROFINET bus cable and push-in terminals

### **SIMATIC CFU PA Edition**

#### Plug-and-produce simplicity

Digitalization requires a digital infrastructure facilitating integrated digital communication right down to the sensors and actuators. You can use the established and proven PROFIBUS PA standard to achieve this. It is integrated into the PA Edition of the SIMATIC CFU, thus combining ruggedness and easy handling with all the advantages of the PROFINET standard based on Industrial Ethernet. Connected devices are automatically addressed. The device is integrated via standardized communication profiles.

This innovative new implementation of the PROFIBUS PA concept makes it possible to combine the simplicity of a point-to-point wiring system with the scalability of digital PROFIBUS PA fieldbus communication. As with digital field devices, it is not necessary to know prior to connection whether the discrete field device is a sensor or actuator – This can be easily configured afterwards via software.

#### Combination of digital fieldbus and discrete I/Os

- 8 × digital fieldbus (PROFIBUS PA)
- 8 × digital inputs/outputs, freely configurable (1 × counter functionality / frequency measurement)

#### Easy to use

- Automatic addressing of PROFIBUS PA field devices
- System-supported detection and integration of PROFIBUS PA field devices into the process control system
  - Utilization of standardized PA profiles
  - Commissioning, device replacement and maintenance wizards
- Implementation of diagnostic messages according to NAMUR NE 107
- Installation on a 35 mm DIN rail

#### Aluminum field housing



SIMATIC CFU aluminum field housing, open



SIMATIC CFU aluminum field housing, closed

The die-cast aluminum housing is suitable for use in zone 2/22 hazardous areas. The following are included in the housing scope of delivery:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The housing has a display window for LED diagnostics.

#### **Ordering data**

#### **Article No.**

#### **Article No.**

##### **SIMATIC CFU PA bundle with push-in terminals**

Comprising:

- SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0

pre-assembled and tested

**6ES7655-5PX11-1XX0**

##### **SIMATIC CFU PA bundle with aluminum enclosure**

Comprising:

- SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0
- Aluminum enclosure with cable glands, shield busbar, shield connection clamps

pre-assembled and tested

**6ES7655-5PX11-1AX0**

**I/O systems**Network transitions  
SIMATIC CFU

## SIMATIC CFU PA Edition

**Technical specifications**

Article number	<b>6ES7655-5PX11-1XX0</b> SIMATIC CFU PA BUNDLE	<b>6ES7655-5PX11-1AX0</b> SIMATIC CFU PA Bundle with Alu housing
<b>General information</b>		
Product type designation	Compact Field Unit	
Number of channels	16	
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M4	
• Isochronous mode	No	
• The user can configure digital channels as input/output as required	Yes	
• Digital channels can be parameterized	Yes	
<b>Engineering with</b>		
• STEP 7 configurable/integrated from version	V5.6 HF2 and higher	
• PCS 7 configurable/integrated from version	V9.0 SP2 and higher	
• PROFINET from GSD version/ GSD revision	GSDML V2.3	
<b>Operating mode</b>		
• Counter	Yes	
<b>Installation type/mounting</b>		
Mounting	on 35 mm DIN rail, 2 spacing units wide	
Mounting position	Horizontal, vertical	
Recommended mounting position	Horizontal, vertical horizontal set up	
<b>Supply voltage</b>		
Type of supply voltage	24 V DC	
Rated value (DC)	24 V	
Reverse polarity protection	Yes	
Short-circuit protection	Yes	
Redundant power supply	Yes	
<b>Mains buffering</b>		
• Mains/voltage failure stored energy time	5 ms; Bridging for field devices and communication	
<b>Input current</b>		
Current consumption (rated value)	2.5 A	
Current consumption, max.	2.55 A	
Inrush current, max.	8 A	
$I^2t$	0.3 A <sup>2</sup> ·s	
<b>Encoder supply</b>		
Number of outputs	8	
Output voltage, min.	18.2 V	
Short-circuit protection	Yes; Electronic	
<b>Output current</b>		
• up to 60 °C, max.	2 A	
• up to 70 °C, max.	1 A	
<b>Power loss</b>		
Power loss, typ.	8.2 W; Depending on the type of BusAdapter used (typ. RJ45)	
<b>Address area</b>		
<b>Address space per station</b>		
• Address space per station, max.	1 440 byte; Dependent on configuration	

**Technical specifications**

Article number	<b>6ES7655-5PX11-1XX0</b> SIMATIC CFU PA BUNDLE	<b>6ES7655-5PX11-1AX0</b> SIMATIC CFU PA Bundle with Alu housing
<b>Digital inputs</b>		
Number of digital inputs	8	
Source/sink input	Yes; P-reading	
Input characteristic curve in accordance with IEC 61131, type 1	Yes	
Input characteristic curve in accordance with IEC 61131, type 2	No	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	
Pulse extension	No	
<b>Number of simultaneously controllable inputs</b>		
<b>horizontal installation</b>		
- up to 60 °C, max.	8; Total current must be observed, see DQ	
- up to 70 °C, max.	8; Total current must be observed, see DQ	
<b>vertical installation</b>		
- up to 60 °C, max.	8; Total current must be observed, see DQ	
<b>Digital input functions, parameterizable</b>		
• Counter	Yes	
- Number, max.	1	
- Counting frequency, max.	1 kHz	
- Counting width	32 bit	
- Counting direction up/down	Yes; Up	
<b>Input voltage</b>		
• Rated value (DC)	24 V	
• for signal *0*	-30 to +5 V	
• for signal *1*	+11 to +30V	
<b>Input current</b>		
• for signal *1*, typ.	2.5 mA; Typical	
<b>Input delay (for rated value of input voltage) for standard inputs</b>		
- parameterizable	No	
- at *0* to *1*, max.	3.2 ms; for counter function 0,1 ms	
- at *1* to *0*, max.	3.2 ms; for counter function 0,1 ms	
<b>Cable length</b>		
• shielded, max.	1 000 m	
• unshielded, max.	600 m	
<b>Digital outputs</b>		
Type of digital output	Transistor	
Number of digital outputs	8	
Current-sinking	No	
Current-sourcing	Yes	
Short-circuit protection	Yes	
• Response threshold, typ.	0.7 to 1.3 A	
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	
Controlling a digital input	Yes	
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	
<b>Load resistance range</b>		
• lower limit	48 Ω	
• upper limit	12 kΩ	
<b>Output voltage</b>		
• Type of output voltage	DC	
• for signal *1*, min.	Ue minus 1 V	
<b>Output current</b>		
• for signal *1* rated value	0.5 A	
• for signal *0* residual current, max.	0.1 mA	

**I/O systems**Network transitions  
SIMATIC CFU

## SIMATIC CFU PA Edition

**Technical specifications**

Article number	<b>6ES7655-5PX11-1XX0</b> SIMATIC CFU PA BUNDLE	<b>6ES7655-5PX11-1AX0</b> SIMATIC CFU PA Bundle with Alu housing
<b>Output delay with resistive load</b>		
• "0" to "1", max.	50 µs	
• "1" to "0", max.	100 µs	
<b>Parallel switching of two outputs</b>		
• for uprating	No	
• for redundant control of a load	No	
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	
• with inductive load, max.	2 Hz	
• on lamp load, max.	10 Hz	
<b>Total current of the outputs</b>		
• Current per channel, max.	0.5 A	
<b>horizontal installation</b>		
- up to 60 °C, max.	2 A	
- up to 70 °C, max.	1 A	
<b>vertical installation</b>		
- up to 60 °C, max.	2 A	
<b>Cable length</b>		
• shielded, max.	1 000 m	
• unshielded, max.	600 m	
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	
- permissible quiescent current (2-wire sensor), max.	1.5 mA	
<b>Interfaces</b>		
Number of PROFINET interfaces	1	
Number of PROFIBUS interfaces	0	
<b>PROFIBUS PA</b>		
• Transmission rate, max.	31.25 kbit/s	
• Number of connectable PA field devices	8; electrically isolated from other interfaces, isolation tested at 2 500 V DC	
• Current output to PA field devices, max.	320 mA	
• permissible current per spur line	40 mA	
• Automatic addressing	Yes	
• System-supported integration of field devices via PA profiles	Yes	
• Extended fieldbus diagnostics	Yes	
<b>1. Interface</b>		
Isolated	Yes	
<b>Interface types</b>		
• Number of ports	2	
• integrated switch	Yes	
• BusAdapter (PROFINET)	Yes	
<b>Protocols</b>		
• PROFINET IO Device	Yes	
• PROFIBUS DP slave	No	
<b>Interface types</b>		
<b>RJ 45 (Ethernet)</b>		
• 100 Mbps	Yes	
• Autonegotiation	Yes	
• Autocrossing	Yes	



**Technical specifications**

Article number	<b>6ES7655-5PX11-1XX0</b>	<b>6ES7655-5PX11-1AX0</b>
	SIMATIC CFU PA BUNDLE	SIMATIC CFU PA Bundle with Alu housing
<b>Protocols</b>		
Supports protocol for PROFINET IO	Yes	
<b>Redundancy mode</b>		
• PROFINET system redundancy (S2)	Yes; Type S2	
<b>Media redundancy</b>		
- MRP	Yes	
<b>Open IE communication</b>		
• LLDP	Yes	
<b>Interrupts/diagnostics/ status information</b>		
Status indicator	Yes	
Alarms	Yes	
Diagnostics function	Yes	
<b>Diagnoses</b>		
• Monitoring of encoder power supply	Yes	
• Wire-break	Yes	
• Short-circuit	Yes	
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; green LED	
• ERROR LED	Yes; red LED	
• MAINT LED	Yes; Yellow LED	
• Monitoring of the supply voltage (PWR-LED)	Yes	
• Status indicator digital input (green)	Yes	
• Status indicator digital output (green)	Yes	
• Spur line status/fault	Yes	
<b>Potential separation</b>		
between the channels and PROFINET	Yes	
<b>Potential separation digital inputs</b>		
• between the channels	No	
• between the channels and the power supply of the electronics	No	
<b>Potential separation digital outputs</b>		
• between the channels	No	
• between the channels and the power supply of the electronics	No	
<b>Degree and class of protection</b>		
IP degree of protection		IP66
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-40 °C	
• max.	70 °C	
<b>Connection method</b>		
Design of electrical connection	Connection plug	

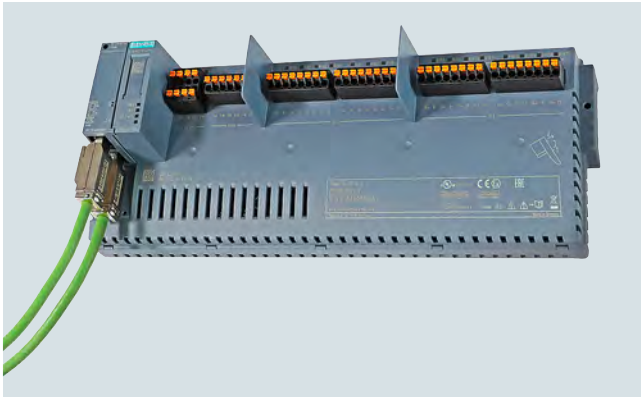
**I/O systems**Network transitions  
SIMATIC CFU

## SIMATIC CFU PA Edition

**Technical specifications**

Article number	<b>6ES7655-5PX11-1XX0</b> SIMATIC CFU PA BUNDLE	<b>6ES7655-5PX11-1AX0</b> SIMATIC CFU PA Bundle with Alu housing
<b>Spur line</b>		
• Number of spur lines	8	
• Type of cable	Type A	
• Cable diameter, min.	6 mm	
• Cable diameter, max.	12 mm	
• Conductor cross-section, min.	0.2 mm <sup>2</sup>	
• Conductor cross-section, max.	2.5 mm <sup>2</sup>	
• Cable length, max.	120 m	
• total current output to field devices, max.	320 mA	
• Number of connectable field devices	8	
• Current limitation per field device, max.	40 mA	
• No-load voltage, max.	15.3 V	
• short-circuit proof	Yes	
• Short-circuit current (test current); max.	8 mA	
• intrinsically safe according to FISCO model	Yes	
• Debounce logic	Yes	
<b>Dimensions</b>		
Width	329 mm	414 mm
Height	123 mm	266 mm
Depth	74 mm	111 mm
<b>Weights</b>		
Weight, approx.	650 g	5.5 kg

## Overview



### SIMATIC CFU DIQ Edition

Individual, customer-specific solutions and flexible system/plant extensions are requirements that are becoming increasingly important in the process industry due to digitalization. SIMATIC CFU DIQ Edition with 16 freely configurable digital IO channels offers a solution for the growing demands of distributed I/O.

SIMATIC CFU also has expansion functions for optional configuration. Two additional operating modes can be activated for selected digital inputs. "Counter" operating mode and "Frequency measurement" operating mode with a cut-off frequency of 1 kHz.

Actuator disconnection can be set for the digital outputs. The actuator disconnection of the SIMATIC CFU uses a monitoring channel (DI channel) to quickly set all digital outputs to a low digital level.

- 16 × digital inputs/outputs, freely configurable (2 × counter functionality / frequency measurement)

### Aluminum field housing



SIMATIC CFU aluminum field housing, open



SIMATIC CFU aluminum field housing, closed

The die-cast aluminum housing is suitable for use in zone 2/22 hazardous areas. The following are included in the housing scope of delivery:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The housing has a display window for LED diagnostics.

### Ordering data

#### SIMATIC CFU DIQ with aluminum housing

Comprising:

- SIMATIC CFU DIQ, Article No. 6ES7655-5PX31-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0
- Aluminum housing with cable glands, shield busbar, shield connection clamp

pre-assembled and tested

### Article No.

6ES7655-5PX31-1AX0

### Article No.

6ES7655-5PX31-1XX0

#### SIMATIC CFU DIQ

Comprising:

- SIMATIC CFU DIQ, Article No. 6ES7655-5PX31-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX31-1XX0

pre-assembled and tested

**I/O systems**Network transitions  
SIMATIC CFU

## SIMATIC CFU DIQ Edition

**Technical specifications**

Article number	<b>6ES7655-5PX31-1AX0</b> SIMATIC CFU DIQ with Alu housing	<b>6ES7655-5PX31-1XX0</b> SIMATIC CFU DIQ
<b>General information</b>		
Product type designation		Compact Field Unit
Number of channels		16
<b>Product function</b>		
<ul style="list-style-type: none"> <li>I&amp;M data</li> <li>Isochronous mode</li> <li>The user can configure digital channels as input/output as required</li> <li>Digital channels can be parameterized</li> </ul>		Yes; I&M0 to I&M4 No Yes Yes
<b>Engineering with</b>		
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated from version</li> <li>PCS 7 configurable/integrated from version</li> <li>PROFINET from GSD version/ GSD revision</li> </ul>		V5.6 HF2 and higher V9.0 SP2 and higher GSDML V2.3
<b>Operating mode</b>		
<ul style="list-style-type: none"> <li>Counter</li> </ul>		Yes
<b>Installation type/mounting</b>		
Mounting		on 35 mm DIN rail, 2 spacing units wide
Mounting position	Horizontal, vertical	Horizontal, vertical
Recommended mounting position	horizontal set up	
<b>Supply voltage</b>		
Type of supply voltage		24 V DC
Rated value (DC)		24 V
Reverse polarity protection		Yes
Short-circuit protection		Yes
Redundant power supply		Yes
<b>Mains buffering</b>		
<ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> </ul>		5 ms; For communication
<b>Input current</b>		
Current consumption (rated value)		5.12 A
Current consumption, max.		5.13 A
Inrush current, max.		4.8 A
$I^2t$		0.073 A <sup>2</sup> ·s
<b>Encoder supply</b>		
Number of outputs		16
Output voltage, min.		18.2 V
Short-circuit protection		Yes; Electronic
<b>Output current</b>		
<ul style="list-style-type: none"> <li>up to 60 °C, max.</li> <li>up to 70 °C, max.</li> </ul>		5 A 4 A
<b>Power loss</b>		
Power loss, typ.		2.88 W; Depending on the type of BusAdapter used (typ. RJ45)
<b>Address area</b>		
<b>Address space per station</b>		
<ul style="list-style-type: none"> <li>Address space per station, max.</li> </ul>		1 440 byte; Dependent on configuration

**Technical specifications**

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
<b>Digital inputs</b>		
Number of digital inputs		16
Source/sink input		Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1		Yes
Input characteristic curve in accordance with IEC 61131, type 2		No
Input characteristic curve in accordance with IEC 61131, type 3		Yes
Pulse extension		No
<b>Number of simultaneously controllable inputs</b>		
<b>horizontal installation</b>		
- up to 60 °C, max.		16; Total current must be observed, see DQ
- up to 70 °C, max.		16; Total current must be observed, see DQ
<b>vertical installation</b>		
- up to 60 °C, max.		16; Total current must be observed, see DQ
<b>Digital input functions, parameterizable</b>		
• Counter		Yes
- Number, max.		2
- Counting frequency, max.		1 kHz
- Counting width		32 bit
- Counting direction up/down		Yes; Up
<b>Input voltage</b>		
• Rated value (DC)		24 V
• for signal *0*		-30 to +5 V
• for signal *1*		+11 to +30V
<b>Input current</b>		
• for signal *1*, typ.		2.5 mA; Typical
<b>Input delay (for rated value of input voltage) for standard inputs</b>		
- parameterizable		No
- at *0* to *1*, max.		3.2 ms; for counter function 0,1 ms
- at *1* to *0*, max.		3.2 ms; for counter function 0,1 ms
<b>Cable length</b>		
• shielded, max.		1 000 m
• unshielded, max.		600 m
<b>Digital outputs</b>		
Type of digital output		Transistor
Number of digital outputs		16
Current-sinking		No
Current-sourcing		Yes
Short-circuit protection		Yes
• Response threshold, typ.		0.7 to 1.3 A
Limitation of inductive shutdown voltage to		Typ. L+ (-50 V)
Controlling a digital input		Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.		5 W
<b>Load resistance range</b>		
• lower limit		48 Ω
• upper limit		12 kΩ
<b>Output voltage</b>		
• Type of output voltage		DC
• for signal *1*, min.		Ue minus 1 V
<b>Output current</b>		
• for signal *1* rated value		0.5 A
• for signal *0* residual current, max.		0.1 mA

**I/O systems**Network transitions  
SIMATIC CFU**SIMATIC CFU DIQ Edition****Technical specifications**

Article number	<b>6ES7655-5PX31-1AX0</b> SIMATIC CFU DIQ with Alu housing	<b>6ES7655-5PX31-1XX0</b> SIMATIC CFU DIQ
<b>Output delay with resistive load</b>		
• "0" to "1", max.		50 µs
• "1" to "0", max.		100 µs
<b>Parallel switching of two outputs</b>		
• for uprating		No
• for redundant control of a load		No
<b>Switching frequency</b>		
• with resistive load, max.		100 Hz
• with inductive load, max.		2 Hz
• on lamp load, max.		10 Hz
<b>Total current of the outputs</b>		
• Current per channel, max.		0.5 A
<b>horizontal installation</b>		
- up to 60 °C, max.		5 A
- up to 70 °C, max.		4 A
<b>vertical installation</b>		
- up to 60 °C, max.		5 A
<b>Cable length</b>		
• shielded, max.		1 000 m
• unshielded, max.		600 m
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor		Yes
- permissible quiescent current (2-wire sensor), max.		1.5 mA
<b>Interfaces</b>		
Number of PROFINET interfaces		1
Number of PROFIBUS interfaces		0
<b>1. Interface</b>		
Isolated		Yes
<b>Interface types</b>		
• Number of ports		2
• integrated switch		Yes
• BusAdapter (PROFINET)		Yes
<b>Protocols</b>		
• PROFINET IO Device		Yes
• PROFIBUS DP slave		No
<b>Interface types</b>		
<b>RJ 45 (Ethernet)</b>		
• 100 Mbps		Yes
• Autonegotiation		Yes
• Autocrossing		Yes
<b>Protocols</b>		
Supports protocol for PROFINET IO		Yes
<b>Redundancy mode</b>		
• PROFINET system redundancy (S2)		Yes; Type S2
<b>Media redundancy</b>		
- MRP		Yes
<b>Open IE communication</b>		
• LLDP		Yes

**Technical specifications**

Article number	<b>6ES7655-5PX31-1AX0</b> SIMATIC CFU DIQ with Alu housing	<b>6ES7655-5PX31-1XX0</b> SIMATIC CFU DIQ
<b>Interrupts/diagnostics/ status information</b>		
Status indicator		Yes
Alarms		Yes
Diagnostics function		Yes
<b>Diagnoses</b>		
• Monitoring of encoder power supply		Yes
• Wire-break		Yes
• Short-circuit		Yes
<b>Diagnostics indication LED</b>		
• RUN LED		Yes; green LED
• ERROR LED		Yes; red LED
• MAINT LED		Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)		Yes
• Status indicator digital input (green)		Yes
• Status indicator digital output (green)		Yes
<b>Potential separation</b>		
between the channels and PROFINET		Yes
<b>Potential separation digital inputs</b>		
• between the channels		No
• between the channels and the power supply of the electronics		No
<b>Potential separation digital outputs</b>		
• between the channels		No
• between the channels and the power supply of the electronics		No
<b>Degree and class of protection</b>		
IP degree of protection	IP66	
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.		-40 °C
• max.		70 °C
<b>Connection method</b>		
Design of electrical connection		Connection plug
<b>Dimensions</b>		
Width	414 mm	329 mm
Height	266 mm	123 mm
Depth	111 mm	74 mm
<b>Weights</b>		
Weight, approx.	5.5 kg	610 g

## I/O systems

Network transitions  
SIMATIC CFU

### BusAdapter

#### Overview



BusAdapter BA 2xRJ45, 2xFC and 2xLC

#### BusAdapter

A BusAdapter as a separate component allows a free choice of SIMATIC CFU connection to PROFINET:

- BA 2xRJ45:  
2 electrical connections for bus cables with standard RJ45 connectors
- BA 2xFC:  
2 electrical connections for direct connection of FastConnect bus cable
- BA 2xLC:  
2 optical ports for fiber-optic cables
- BA 1xLC, 1xRJ45:  
Combination bus adapter comprising 1 optical connection and one electrical connection standard RJ45
- BA 1xLC, 1xFC:  
Combination bus adapter 1 optical connection and 1 electrical connection for direct connection of FastConnect bus cable
- BA 2xRJ45 VD:  
2 electrical connections for Ethernet communication via 2, 4 or 8-wire copper cables and distances up to 500 m

#### Ordering data

##### BusAdapter

**BusAdapter BA 2xRJ45**  
2 x RJ45 connections  
for PROFINET  
(standard Ethernet socket)

**BusAdapter BA 2xFC**  
2 x FastConnect (FC) connections  
for PROFINET

**BusAdapter BA 2xLC**  
2 x glass fiber-optic connections

##### Article No.

6DL1193-6AR00-0AA0

6DL1193-6AF00-0AA0

6DL1193-6AG00-0AA0

##### Article No.

##### BusAdapter BA LC/RJ45

2 x glass fiber-optic connections

##### BusAdapter BA LC/FC

2 x glass fiber-optic connections

##### BusAdapter BA 2xRJ45 (VD)

2 x electrical connections for  
Ethernet communication via 2, 4 or  
8-wire copper cables and distances  
up to 500 m

6DL1193-6AG20-0AA0

6DL1193-6AG40-0AA0

6GK5991-2VA00-8AA2

#### Technical specifications

Article number	6DL1193-6AR00-0AA0 ET 200SP HA, BUSADAPTER BA 2XRJ45	6DL1193-6AF00-0AA0 ET 200SP HA, BUSADAPTER BA 2XFC	6DL1193-6AG00-0AA0 ET 200SP HA, BUSADAPTER BA 2XLC
<b>General information</b>			
Product type designation	BA 2x RJ45	BA 2xFC	BA 2xLC
<b>Interfaces</b>			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1; 2 ports (switch) FC	1; 2 ports (switch) LC Multimode Glass Fibre
<b>Supports protocol for PROFINET IO</b>			
• Number of RJ45 ports	2		
• Number of FC (FastConnect) connections		2	
• Number of LC ports			2
<b>Cable length</b>			
- Cu conductors	100 m	100 m	
- Multimode graded-index fiber 50/125 µm			3 km
- Multimode graded-index fiber 62.5/125 µm			3 km
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	65 °C; redundant design (2x 6DL1155-6AU00-0PM0) : max. 60 °C horizontal, max. 50 °C vertical. When using different I/O devices, the derating specified there must be observed



**Technical specifications**

Article number	<b>6DL1193-6AR00-0AA0</b> ET 200SP HA, BUSADAPTER BA 2XRJ45	<b>6DL1193-6AF00-0AA0</b> ET 200SP HA, BUSADAPTER BA 2XFC	<b>6DL1193-6AG00-0AA0</b> ET 200SP HA, BUSADAPTER BA 2XLC
<b>Dimensions</b>			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm	59 mm
<b>Weights</b>			
Weight, approx.	46 g	53 g	60 g
Article number	<b>6DL1193-6AG20-0AA0</b> ET 200SP HA, BUSADAPTER BA LC/RJ45	<b>6DL1193-6AG40-0AA0</b> ET 200SP HA, BUSADAPTER BA LC/FC	
<b>General information</b>			
Product type designation	BA LC/RJ45	BA LC/FC	
<b>Interfaces</b>			
Number of PROFINET interfaces	1; 2 ports (switch) LC / RJ45	1; 2 ports (switch) LC / FC	
<b>Supports protocol for PROFINET IO</b>			
• Number of RJ45 ports	1	1	
• Number of FC (FastConnect) connections			
• Number of LC ports	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	
<b>Cable length</b>			
- Cu conductors	100 m	100 m	
- Multimode graded-index fiber 50/125 µm	3 km	3 km	
- Multimode graded-index fiber 62.5/125 µm	3 km	3 km	
<b>Standards, approvals, certificates</b>			
RoHS conformity	Yes	Yes	
China RoHS compliance	Yes	Yes	
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-40 °C	-40 °C	
• max.	70 °C; = Tmax for horizontal installation; for vertical installation Tmax = 60 °C; redundant setup (2x 6DL1155-6AU00-0PM0): max. 65 °C horizontally, max. 60 °C vertically. When using different IO Devices, the derating specified there must be observed.	65 °C; = Tmax for horizontal installation; for vertical installation Tmax = 60 °C; redundant setup (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontally, max. 55 °C vertically. When using different IO Devices, the derating specified there must be observed.	
<b>Dimensions</b>			
Width	20 mm	20 mm	
Height	75 mm; Without protective caps (approx. 8 mm)	75 mm; Without protective caps (approx. 8 mm)	
Depth	59 mm	59 mm	
<b>Weights</b>			
Weight, approx.	32 g	50 g	
Article number	<b>6GK5991-2VA00-8AA2</b> BA 2xRJ45VD HA	Article number	<b>6GK5991-2VA00-8AA2</b> BA 2xRJ45VD HA
product type designation	BA 2xRJ45VD HA	product type designation	BA 2xRJ45VD HA
suitability for use	Ethernet transmission via 2, 4 and 8-wire line	type of electrical connection	RJ45
suitability for operation	Products with BusAdapter interface (requirement: the BusAdapter is approved in the firmware of the basic unit)	operating mode	Yes
		• standard Ethernet	Yes; Depending on number of wires (2, 4 or 8-wire)
		• VD	
<b>interfaces</b>		<b>further information internet-Links</b>	
number of electrical connections			
• for network components or terminal equipment maximum	2		
number of 10/100 Mbit/s RJ45 ports	2		

## I/O systems

Network transitions

SIMATIC CFU

### Accessories

Ordering data	Article No.
<b>Connection system</b>	
<b>SIMATIC CFU screw-type terminals</b> Complete set of screw-type terminals for SIMATIC CFU: two-tier 2x2 (24 V), single-tier 1x6 (GND) and single-tier 4x8 (IO)	<b>6ES7655-5PX00-2XX0</b>
<b>SIMATIC CFU push-in terminals</b> Complete set of push-in terminals for SIMATIC CFU: two-tier 2x2 (24 V), single-tier 1x6 (GND) and single-tier 4x8 (IO)	<b>6ES7655-5PX00-1XX0</b>

## SIMATIC control systems



<b>11/2</b>	<b>FM 458-1 DP application module</b>
11/2	Introduction
11/3	FM 458-1 DP basic module
11/5	EXM 438-1 input/output expansion
11/7	EXM 448-2 universal communication expansion module
11/8	D7-SYS
<b>11/9</b>	<b>SIMATIC TDC multiprocessor control system</b>
11/9	Introduction, UR6021 rack
11/10	CPU555, CPU551 processor modules
11/11	MC5xx program memory module, CP50M1 communications module
11/12	CP51M1 communications module, CP53M0 coupling module
11/13	SM500 I/O module
11/15	SM500 DI/DQ I/O module
11/16	GlobalDataMemory
11/17	Accessories

## SIMATIC control systems

### FM 458-1 DP application module

#### Introduction

#### Overview



#### **SIMATIC FM 458-1 DP integrated in SIMATIC S7-400**

- Designed for high-performance and user-configurable closed-loop control tasks in the SIMATIC S7-400.
- Can be adapted to individual requirements as required, such as: Controlling, computing, closed-loop control as well as motion control. Can therefore be used flexibly for a wide variety of applications.
- Extensive library with approx. 300 function blocks: E.g. simple functions such as AND, ADD and OR through to complex GMC (General Motion Control) blocks as virtual master or gear functions.
- User-friendly graphical configuration with the SIMATIC engineering tool CFC (Continuous Function Chart) and the D7-SYS add-on software package: Optimum code generation by the compiler, therefore SCL is not required.
- PROFIBUS DP interface onboard.

SIMATIC FM 458-1 DP is based on more than 15 years experience with high-performance control systems and combines this know-how with the advantages of SIMATIC – the leading automation system for decades. In contrast to other function modules with static structures/functions, the FM 458-1 DP application module can be configured flexibly and adapted to individual requirements.

### Overview



- Basic module for computing, closed-loop control and open-loop control tasks
- PROFIBUS DP interface for connection of distributed I/O and drives
- Modular design with expansion modules for I/O and communication

### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>FM 458-1 DP application module</b> Basic module for computing, closed-loop control and open-loop control tasks; with PROFIBUS DP interface	<b>6DD1607-0AA2</b>	<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbps Without PG interface With PG interface	<b>6ES7972-0BA12-0XA0</b> <b>6ES7972-0BB12-0XA0</b>
<b>Micro Memory Card</b> For FM 458-1 DP basic module 2 MB 4 MB 8 MB	<b>6ES7953-8LL31-0AA0</b> <b>6ES7953-8LM32-0AA0</b> <b>6ES7953-8LP31-0AA0</b>	<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbps Without PG interface With PG interface	<b>6ES7972-0BA42-0XA0</b> <b>6ES7972-0BB42-0XA0</b>
<b>FM 458-1 DP Know-How-Protect</b> For protection of technological application modules against unauthorized copying	<b>6DD1607-0GA0</b>	<b>RS 485 bus connector with 90° cable outlet for FastConnect connection system</b> Max. transfer rate 12 Mbps Without PG interface • 1 unit • 100 units With PG interface • 1 unit • 100 units	<b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b> <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b>
<b>SC64 interface cable</b> To connect FM 458-1 to the serial port of a programming device/ PC	<b>6DD1684-0GE0</b>	<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1000 m, minimum ordering quantity 20 m Preferred lengths:	<b>6XV1830-0EH10</b>  <b>6XV1830-0EN20</b> <b>6XV1830-0EN50</b> <b>6XV1830-0ET10</b>
<b>SB10 interface module</b> To connect 8 binary I/Os to FM 458-1 DP	<b>6DD1681-0AE2</b>		
<b>SB61 interface module</b> To connect 8 binary I/Os to FM 458-1 DP, input voltage: 24/48 V DC	<b>6DD1681-0EB3</b>		
<b>SU12 interface module</b> To connect 10 signals to FM 458-1 DP	<b>6DD1681-0AJ1</b>		

**SIMATIC control systems**

## FM 458-1 DP application module

## FM 458-1 DP basic module

**Technical specifications**

Article number	<b>6DD1607-0AA2</b> FM458-1 DP Application Module
<b>Supply voltage</b>	
Rated value (DC)	
• 5 V DC	Yes
• 24 V DC	Yes
<b>Input current</b>	
Current consumption, typ.	1.5 A
Current consumption, max.	3 A
<b>Memory</b>	
<b>Backup</b>	
• present	Yes
<b>Battery</b>	
<b>Backup battery</b>	
• Backup current, max.	15 µA
<b>Hardware configuration</b>	
<b>Slots</b>	
• required slots	1
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time)	Yes

Article number	<b>6DD1607-0AA2</b> FM458-1 DP Application Module
<b>Digital inputs</b>	
Number of digital inputs	8; Connector X2
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-1 to +6V
• for signal "1"	13.5 to 33V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	0 mA
• for signal "1", typ.	3 mA; at 24 V
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	5 µs
<b>Protocols</b>	
<b>PROFIBUS DP</b>	
<b>Services</b>	
- Equidistance	Yes; With connection to interrupt tasks
- Direct data exchange (slave-to-slave communication)	Yes
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
• Potential separation digital inputs	No; only via optional interface modules
<b>Weights</b>	
Weight, approx.	1 000 g

### Overview



- Optional plug-in expansion module for the FM 458-1 DP basic module
- Used to read in and output time-critical signals
- With digital and analog inputs/outputs
- Incremental and absolute encoders can be connected
- 4 high-resolution analog outputs
- Fan-free operation up to 40 °C

### Ordering data

### Article No.

<b>EXM 438-1 input/output expansion</b> For direct exchange of digital and analog signals between FM 458-1 DP and the plant	<b>6DD1607-0CA1</b>
<b>SB10 interface module</b> To connect 8 binary inputs or outputs to FM 458-1 DP	<b>6DD1681-0AE2</b>
<b>SB61 interface module</b> To connect 8 binary inputs to FM 458-1 DP, input voltage: 24/48 V DC	<b>6DD1681-0EB3</b>
<b>SB71 interface module</b> To connect 8 binary outputs to FM 458-1 DP, output voltage: 24/48 V DC	<b>6DD1681-0DH1</b>
<b>SU12 interface module</b> To connect 10 signals to FM 458-1 DP	<b>6DD1681-0AJ1</b>
<b>SU13 interface module</b> To connect 50 signals to FM 458-1 DP	<b>6DD1681-0GK0</b>
<b>SC62 interface cable</b> To connect EXM 438-1 with up to 5 SBxx or SU12	<b>6DD1684-0GC0</b>
<b>SC63 interface cable</b> To connect EXM 438-1 with an SU13	<b>6DD1684-0GD0</b>

### Technical specifications

Article number	<b>6DD1607-0CA1</b> EXM 438-1 I/O Expansion
<b>Supply voltage</b>	
Rated value (DC)	
• 5 V DC	Yes
• 24 V DC	Yes; to be set up externally
<b>Input current</b>	
Current consumption, typ.	1.5 A
<b>Encoder supply</b>	
Type of output voltage	about 14 V (non-isolated)
Short-circuit protection	Yes; Electronic
<b>Output current</b>	
• Rated value	100 mA
<b>Power loss</b>	
Power loss, typ.	7.5 W
<b>Hardware configuration</b>	
<b>Slots</b>	
• required slots	1
<b>Digital inputs</b>	
Number of digital inputs	16
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-1 to +6 V or input open
• for signal "1"	+13 to +33V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	0 mA
• for signal "1", typ.	3 mA

Article number	<b>6DD1607-0CA1</b> EXM 438-1 I/O Expansion
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	200 µs
<b>Digital outputs</b>	
Number of digital outputs	8
Short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	250 mA
Limitation of inductive shutdown voltage to	Supply voltage +1 V
<b>Output voltage</b>	
• for signal "0", max.	3 V
• for signal "1", max.	Supply voltage -2.5 V
<b>Output current</b>	
• for signal "1" rated value	50 mA
• for signal "1" permissible range for 0 to 40 °C, min.	100 mA
• for signal "0" residual current, max.	20 µA
• Total switching current	80% at 50 °C all outputs 50 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	15 µs

# SIMATIC control systems

## FM 458-1 DP application module

### EXM 438-1 input/output expansion

#### Technical specifications

Article number	<b>6DD1607-0CA1</b> EXM 438-1 I/O Expansion
<b>Analog inputs</b>	
Number of analog inputs	5; Differential inputs
<b>Input ranges (rated values), voltages</b>	
• -10 V to +10 V	Yes; -10 V: $\pm 4$ LSB; to +10 V: $\pm 4$ LSB (1 LSB = 4.88 mV)
- Input resistance (-10 V to +10 V)	470 k $\Omega$
<b>Analog outputs</b>	
Number of analog outputs	8; 4 outputs 16 bit; 4 outputs 12 bit
Voltage output, short-circuit protection	Yes; relative to frame
Voltage output, short-circuit current, max.	16 bit: 27 mA; 12 bit: 100 mA
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	12 bit
• Conversion time (per channel)	45 $\mu$ s
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	4 AO: 16 bit, 4 AO: 12 bit
• Conversion time (per channel)	4 AO (16 bit): 2 $\mu$ s; 4 AO (12 bit): 4 $\mu$ s
<b>Encoder</b>	
Number of connectable encoders, max.	12; 8 incremental encoders (synchronizable), 4 absolute encoders
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes; Single or multturn encoder with SSI (synchronous serial) or EnDat interface

Article number	<b>6DD1607-0CA1</b> EXM 438-1 I/O Expansion
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	1) for tracks A and B (90° out of phase), poss. with zero pulse N; 2) for separate forward and backward track
• Input voltage	With 0 signal: -5 to 0 V; with 1 signal: +3 to +5 V; permissible input voltage range: differential voltage -5 to +5 V; max. input current: 15 mA (important: not limited on module side!)
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Trace mark signals	Track A and B (phase-shifted by 90 degrees), possibly with zero pulse N
• Input voltage	with 0 signal: -30 to +4 V (at 15 mA load); with 1 signal: +8 to 30 V (at 15 mA load); permissible input voltage range: differential voltage -30 to +30 V
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V acc. to RS 422
• Data signal	Dual-, Gray-, Gray-Excess-Code
• Clock frequency, max.	2 MHz; 100 kHz to 2 MHz (depending on cable length)
<b>Errors/accuracies</b>	
Linearity error (relative to output range), (+/-)	( $\pm 1$ LSB )
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
• Potential separation digital inputs	No
<b>Potential separation digital outputs</b>	
• Potential separation digital outputs	No
<b>Potential separation analog inputs</b>	
• Potential separation analog inputs	No
<b>Potential separation analog outputs</b>	
• Potential separation analog outputs	No
<b>Weights</b>	
Weight, approx.	1 kg



#### Overview



- Optional plug-in expansion module for the FM 458-1 DP basic module
- For high-speed communication over up to 2 SIMOLINK interfaces
- For coupling several FM 458-1 DP application modules in synchronism with the sampling time

#### Ordering data

#### Article No.

##### EXM 448-2 universal communication expansion

For high-speed communication with drives; for establishing two SIMOLINK fiber optic connections

**6DD1607-0EA2**

#### Technical specifications

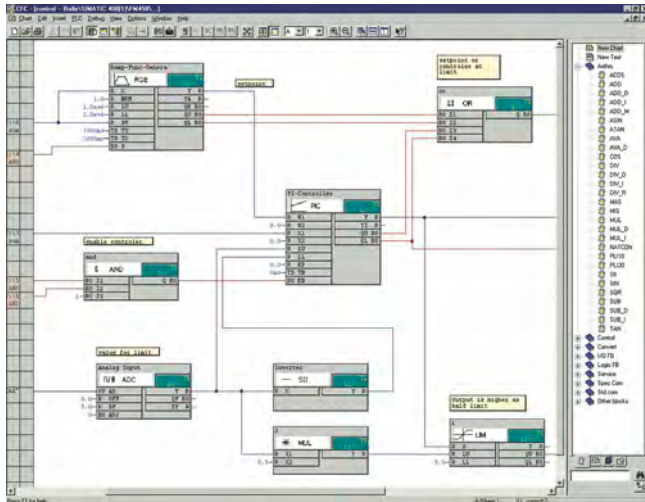
Article number	<b>6DD1607-0EA2</b> SIMATIC S7-400 EXM 448-2 Comm.-Expans.
<b>Supply voltage</b>	
Rated value (DC)	
• 5 V DC	Yes
<b>Input current</b>	
Current consumption, typ.	0.6 A
<b>Hardware configuration</b>	
<b>Slots</b>	
• required slots	1
<b>Weights</b>	
Weight, approx.	0.9 kg

## SIMATIC control systems

### FM 458-1 DP application module

#### D7-SYS

##### Overview



- Optional package for STEP 7 V5.6 for configuring closed-loop control and automation tasks with SIMATIC TDC, FM 458-1 DP and T400
- Extensive block library
- Generation of user libraries in ANSI C with D7-FB-GEN function block generator

##### Licensing

- D7-SYS is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 9.0 is available for users of the previous 8.x version.
- A separate Software Update Service can be purchased for D7-SYS.
- As of version 8.1, the D7-FB-GEN block generator that was previously sold separately is included in the D7-SYS scope of delivery.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

<http://www.siemens.com/simatic-licenses>

##### Ordering data

##### Article No.

##### SIMATIC D7-SYS V9.0

Reference hardware:  
SIMATIC TDC, FM 458-1 DP, T400

Requirement:

MS Windows 7 Professional with SP1 (64-bit) (English language version only)  
MS Windows 7 Ultimate and Enterprise with SP1 (64-bit)  
MS Windows 10 Pro and Enterprise (64-bit)  
MS Windows Server 2008 R2 Standard Edition with SP1 (64-bit)  
MS Windows Server 2012 R2 Standard Edition (64-bit)  
MS Windows Server 2016 Standard Edition (64-bit)  
STEP 7 V5.6

Type of delivery:  
On DVD, en, de, with electronic documentation

Floating license

**6ES7852-0CC06-0YA5**

Upgrade license from V8.x to V9.0

**6ES7852-0CC06-0YE5**

Software Update Service<sup>1)</sup>

**6ES7852-0CC01-0YL5**

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

<sup>1)</sup> For more information on the software update service, see page 12/2.

##### Accessories

##### Overview

- Interface modules and interface cables for the FM 458-1 DP application modules

##### Note:

For information on interface cables SC 62, SC 63, SC 64 and interface modules SB10, SB61, SB71, SU12 and SU13, see SIMATIC TDC multiprocessor control system, accessories, page 11/17.

### Introduction



SIMATIC TDC (Technology and Drives Control) is a digital automation system featuring very high computing power and the ability to process very large programs. An extensive library with approx. 300 ready-made function blocks is available for fast engineering.

### Overview UR6021 rack



- UR6021 rack as the base component for SIMATIC TDC
- Integrated system power supply and system fan
- With high-performance 64-bit backplane bus for high-speed data exchange between the inserted modules
- Requirement for operating the CPU555

### Ordering data

### Article No.

<b>UR6021 rack</b>	<b>6DD1682-0CH3</b>
Spare-part compatible successor of 6DD1682-0CH2	
<b>Accessories</b>	
<b>SR51 slot cover</b>	<b>6DD1682-0DA1</b>
<b>Spare parts</b>	
<b>Backup battery</b>	<b>6ES7971-0BA00</b>
<b>Fan insert for UR6021</b>	<b>6DD1683-0CH3</b>

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

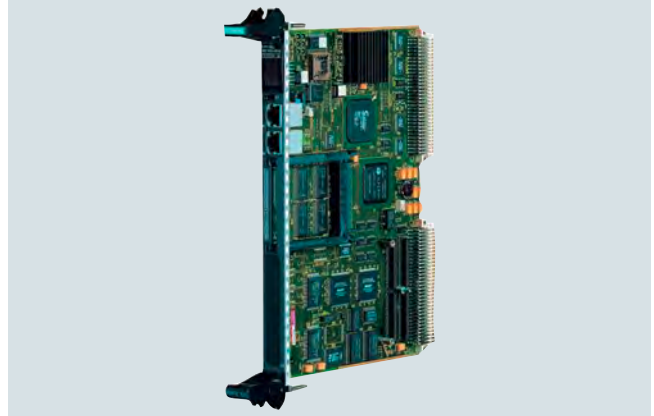
#### CPU555, CPU551 processor modules

##### Overview CPU555 processor module



- Graphically freely configurable processor module
- For implementing highly dynamic open and closed-loop control functions

##### Overview CPU551 processor module



High-performance CPU module for open and closed-loop control and arithmetic tasks.

Ordering data	Article No.
<b>CPU555 processor module</b>	<b>6DD1600-0BB0</b>
<b>Accessories</b>	
<b>SIMATIC Micro Memory Card</b>	
2 MB	6ES7953-8LL31-0AA0
4 MB	6ES7953-8LM32-0AA0
8 MB	6ES7953-8LP31-0AA0
<b>Crossed twisted pair cables 4x2 with RJ45 connectors</b>	
0.5 m	6XV1870-3RE50
1 m	6XV1870-3RH10
2 m	6XV1870-3RH20
6 m	6XV1870-3RH60
10 m	6XV1870-3RN10

Ordering data	Article No.
<b>CPU551 processor module</b>	<b>6DD1600-0BA3</b>
<b>Accessories</b>	
<b>MC500 memory module (4 MB)</b>	<b>6DD1610-0AH4</b>
<b>MC510 memory module (8 MB)</b>	<b>6DD1610-0AH6</b>
<b>MC521 memory module (2 MB)</b>	<b>6DD1610-0AH3</b>

##### Technical specifications

<b>CPU551</b>	
Required space / width	1 slot
Weight	0.6 kg
Display	5x7 LED
Local service interface	Serial RS232 interface
Sampling intervals	from 100 µs
SDRAM	128 MB
Synchronous cache	8 MB
Clock frequency	500 MHz
CPU	64 Bit RISC CPU with floating point unit
SRAM	512 KB, battery buffered
<b>Power supply</b>	
Voltage / Power supply (at 250°C)	+3.3 V, 2.0 A typical +5 V, 1.5 A typical +12 V, 0.04 A typical -12 V, 0.04 A typical
Buffer battery	3.0 V, 3 µA typical
Power loss, typical	15 W
<b>Digital inputs</b>	
Number	8 inputs, 4 with alarm capability
Galvanic isolation	Only through optional interface modules
Input voltage	
• Rated voltage	24 V
• For 0-signal	-1 V ... +6 V
• For 1-signal	+13.5 V ... +33 V
Input power	
• At 0-signal	0 mA
• At 1-signal	3 mA
Delay time	100 µs
Real-time clock, resolution	0.1 ms

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### MC5xx program memory module, CP50M1 communications module

##### Overview MC500 memory module

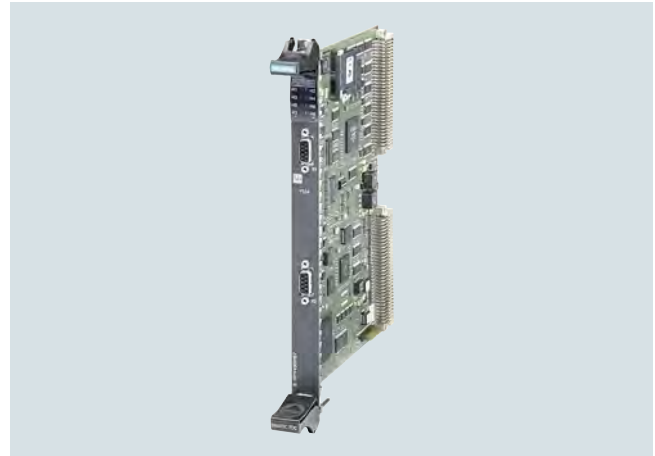
Program memory module for the program designed with CFC.

##### Ordering data

##### Article No.

MC500 memory module (4 MB)	6DD1610-0AH4
MC510 memory module (8 MB)	6DD1610-0AH6
MC521 memory module (2 MB)	6DD1610-0AH3

##### Overview CP50M1 communications module



The CP50M1 communications module provides two PROFIBUS DP/MPI interfaces and an 8 MB interprocessor memory for inter-CPU communication. The interfaces can be used as PROFIBUS DP master, slave, as master and slave simultaneously or as MPI node.

##### Ordering data

##### Article No.

CP50M1 communications module	6DD1661-0AD1
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##### Technical specifications

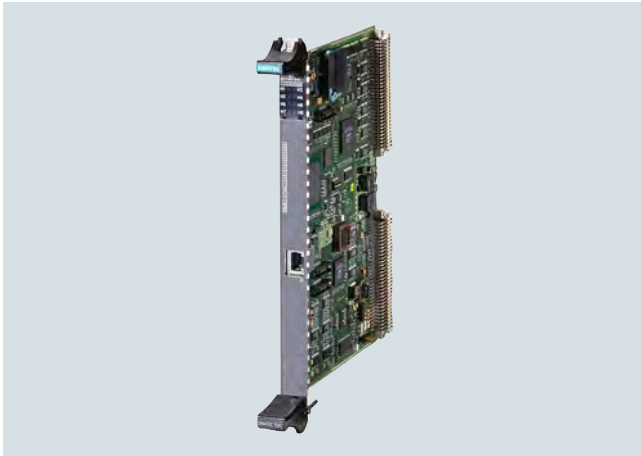
Power supply	
Voltage / Power supply	+5 V, 1.0 A typical
Power loss, typical	5 W
Required space / width	1 slot
Weight	0.34 kg

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

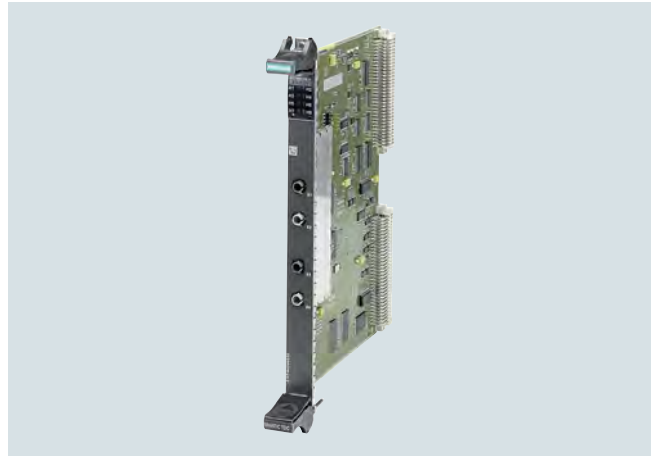
#### CP51M1 communications module, CP53M0 coupling module

##### Overview CP51M1 communications module



The CP51M1 communications module is an Industrial Ethernet interface module for the SIMATIC TDC automation system.

##### Overview CP53M0 coupling module



The CP53M0 coupling module allows coupling of a SIMATIC TDC system to a SIMADYN D system for fast data exchange, e.g. when expanding existing SIMADYN D systems.

##### Ordering data

##### Article No.

CP51M1 communications module	6DD1661-0AE1
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##### Technical specifications

Please refer to the up-to-date technical specifications in the user documentation provided at the time of delivery

Required space / width	1 slot
Weight	
Connection for Industrial Ethernet	RJ45
Protocols	TCP/IP and/or UDP
Message frame lengths	also larger than 2 KB
Modes of transfer	Refresh, Handshake, Multiple and Select
Autosensing	for 10 Mbit or 100 Mbit network
Default router	adjustable

##### Ordering data

##### Article No.

CP53M0 coupling module	6DD1660-0BJ0
------------------------	--------------

For connection of a SIMATIC TDC system to a SIMADYN D system or to two further SIMATIC TDC racks

##### Technical specifications

##### CP53M0 coupling module

##### Memory

Communication memory	SRAM, 128 KB
Communications buffer	SDRAM, 8 MB

##### FOC interface

Number	2 (master mode) 1 (slave mode)
--------	-----------------------------------

Data transfer rate	96 Mbit/s
Coding	5B/6B

##### Voltage, currents

Voltages / currents	+5 V / 0.3 A 3.3 V / 0.5 A
---------------------	-------------------------------

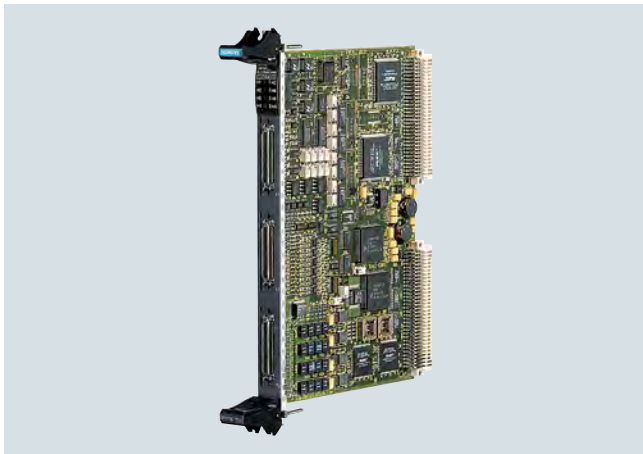
##### Power loss

Power loss, typical	3.1 W
---------------------	-------

##### Dimensions

Number of slots required in rack	1
Dimensions W x H x D (in mm)	20 x 233 x 160
Weight	0.6 kg

### Overview



The SM500 I/O module provides analog and digital inputs/outputs as well as incremental and absolute value encoder connections.

### Ordering data

#### Article No.

SM500 I/O module

6DD1640-0AH0

### Technical specifications

#### Power supply

Voltage / Power supply (at 25°C)	+5 V typically 1.0 A +3.3 V typically 0.05 A +12 V typically 0.3 A -12 V typically 0.3 A
----------------------------------	---

Typical power loss	12.5 W
--------------------	--------

Required space / width	1 slot
------------------------	--------

Weight	0.7 kg
--------	--------

#### Analog outputs

Number	8
--------	---

Version	Output with associated ground
---------	-------------------------------

Galvanic isolation	No
--------------------	----

Output voltage range	-10 V to +10 V
----------------------	----------------

Output current	±10 mA
----------------	--------

Resolution	12 bit
------------	--------

Typical conversion time per channel	4 µs
-------------------------------------	------

#### Accuracy:

• Max. differential linearity error	± 1 LSB (monotony guaranteed)
• Max. amplification error	± 0.3 %
• Max. offset error	± 24 LSB

Slew rate	Approx. 3.5 V/µs
-----------	------------------

#### Voltage output:

• Short-circuit protection to ground	yes
• Short-circuit current	Approximately 100 mA

#### Analog inputs

Number	8
--------	---

Version	Differential inputs
---------	---------------------

Galvanic isolation	No
--------------------	----

Input voltage range	-10 V to +10V
---------------------	---------------

Resolution	12 bit
------------	--------

Max. conversion time per channel	Approx. 20 µs
----------------------------------	---------------

#### Accuracy:

• Max. differential linearity error	± 1 LSB (no missing code)
• Max. amplification error	± 0.3 %
• Max. offset error	± 5 LSB

Input resistance	20 kΩ
------------------	-------

Input filter	34 kHz
--------------	--------

Reverse polarity protection	Yes, as differential inputs are used
-----------------------------	--------------------------------------

#### Integrating analog inputs (V/f)

Number	4
--------	---

Version	Differential inputs
---------	---------------------

Galvanic isolation	No
--------------------	----

Input voltage range	-10 V to +10 V
---------------------	----------------

Resolution	Depending on the integration time, e.g. 15 bits for a 4 ms integration time.
------------	--

Max. integration time per channel	Configurable
-----------------------------------	--------------

#### Accuracy:

• Max. amplification error	0.05 %
• Max. integral linearity error	1 %
• Max. offset error	± 2 LSB (software adjustment)

Input resistance	470 kΩ
------------------	--------

Input filter	2 kHz
--------------	-------

Reverse polarity protection	Yes, as differential inputs are used
-----------------------------	--------------------------------------

**SIMATIC control systems**

## SIMATIC TDC multiprocessor control system

**SM500 I/O module****Technical specifications****Digital outputs**

Number	16
Galvanic isolation	Only through optional interface modules
External power supply:	
• Nominal voltage	24 V
• Permissible range	20 to 30
• Short-term	35 V for max. 0.5 s
• Max. current consumption, without load	40mA
Output voltage range:	
• With 0 signal, max.	3 V
• With 1 signal, min.	ext. supply voltage -2.5 V
Output current:	
• With 0 signal, min.	- 20 µA
• With 1 signal	
- Rated value	50 mA
- Permissible range, max.	100 mA
Delay time	100µs
Max. switching frequency of the outputs under resistive load	6 kHz
Short-circuit protection to	
• Mass	yes
• Ext. power supply	No
Max. short-circuit current	250 mA
Total current of outputs (up to 60°C)	16 x 50mA
Limiting of inductive cut-off voltage.	External power supply +1 V

**Digital inputs**

Number	16
Electrical isolation	Only through optional interface modules
Input voltage:	
• Nominal voltage	24 V
• For 0-signal	-1 V to +6 V
• For 1-signal	+13.5 V to +33 V
Input current:	
• With 0 signal	0 mA
• With 1 signal	3 mA
Delay time	100 µs

**Incremental encoder**

Number	4
Connectable types	Incremental encoders with 90 degree track phase offset
Version	Differential inputs, switchable between 15 V (HTL) and 5 V (TTL) encoder signals
Track signals	Tracks A, B with or without zero pulse
Min. phase difference of the track signals	200 ns
Max. pulse frequency (track frequency)	1 MHz

Input voltage:	
• 15 V encoder	
- Permissible range	- 30 V to + 30 V
- With 0 signal	- 30 V to + 4 V
- With 1 signal	+ 8 V to +30 V
• 5 V encoder	
- Permissible range	- 7 V to + 7 V
- With 0 signal	- 7 V to - 0.7 V
- With 1 signal	+1.5 V to + 7 V

Input current	
• With 15 V encoder (typical, absolute)	5.0 mA
• With 5 V encoder (typical, absolute)	1.5 mA

Monitoring output	Not available
-------------------	---------------

Monitoring input	Specification as for digital input
------------------	------------------------------------

Interrupt reset output	
• Short-circuit protection against ground	yes
- Ext. power supply	No
- Max. short-circuit current	20 mA

Alarm input:	
• Input voltage (permissible range)	0 V to 5 V
- 0 signal, max.	< 0.5 V
- 1 signal, min.	> 2.0 V
• Input current	
- 0 signal	- 2.8 mA
- 1 signal	1.6 mA

**Sensor supply voltage**

Number	1
Electrical isolation	No
Typical output voltage	13.5 V
Max. output current	150 mA, short-circuit-proof against ground, short-circuit current approx. 250 mA

**Absolute encoder inputs**

Number	4
Version	Differential inputs, RS485 signal level
Connectable types	Single or multturn encoder
Protocols	SSI, EnDat
Data formats	Gray code, binary
Data direction	
• Unidirectional	SSI
• Bi-directional	EnDat
Data bits	SSI: 13+Parity, 25+Parity EnDat: variable
Max. pulse frequency	2 MHz, depending on cable length
Input voltage	
• Permissible range	RS485 signal level



### Overview

The SM500 DI/DQ I/O module provides digital inputs and outputs.

### Ordering data

### Article No.

#### SM500 DI/DQ I/O module

16 DI/16 DQ; 6 LEDs

**6DD1640-0AH1**

### Technical specifications

#### Power supply

Voltage / Power supply (at 25°C)	+5 V typically 0.4 A +3.3 V typically 0.05 A
----------------------------------	---

Typical power loss	3 W
--------------------	-----

Required space / width	1 slot
------------------------	--------

Weight	0.6 kg
--------	--------

#### Digital outputs

Number	16
--------	----

Galvanic isolation	Only through optional interface modules
--------------------	---

#### External power supply:

• Nominal voltage	24 V
• Permissible range	20.4 V to 28.8 V
• Short-term	35 V for max. 0.5 s
• Max. current consumption, without load	40mA

#### Output voltage range:

• At 0 signal, max.	3 V
• At 1 signal, min.	ext. supply voltage -2.5 V

#### Output current:

• At 0 signal, min.	- 20 µA
• At 1 signal	
- Rated value	50 mA
- Permissible range, max.	100 mA

Delay time	100 µs
------------	--------

Max. switching frequency of the outputs under resistive load	6 kHz
--	-------

#### Short-circuit protection to

• Mass	Yes
• Ext. power supply	No

Max. short-circuit current	250 mA
----------------------------	--------

Total current of outputs (up to 60°C)	16 x 50mA
---------------------------------------	-----------

Limiting of inductive cut-off voltage.	External supply voltage +1 V
--	------------------------------

#### Digital inputs

Number	16
--------	----

Galvanic isolation	Only through optional interface modules
--------------------	---

#### Input voltage:

• Nominal voltage	24 V
• For 0 signal	-1 V to +6 V
• For 1 signal	+13.5 V to +33 V

#### Input current:

• At 0 signal	0 mA
• At 1 signal	3 mA

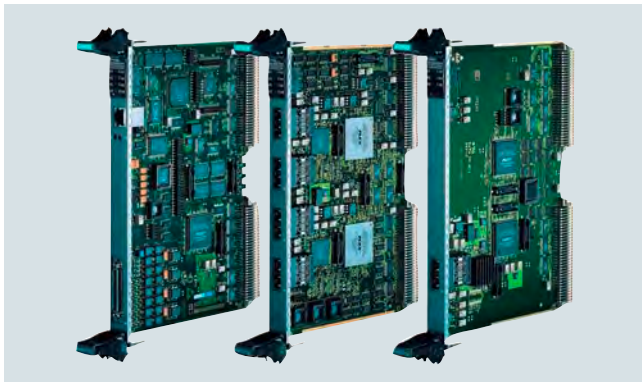
Delay time	100 µs
------------	--------

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### GlobalDataMemory

#### Overview



#### GlobalDataMemory

Data can be exchanged between all of the CPU modules in the system, over all of the networked subracks, using the memory in the GlobalDataMemory (GDM). Up to 44 subracks can be coupled in synchronism through the central memory. This means that a maximum of 836 CPU modules can be used.

#### Ordering data

#### Article No.

<b>CP52M0 memory module</b>	<b>6DD1660-0BF0</b>
<b>CP52IO interface module</b>	<b>6DD1660-0BG0</b>
<b>CP52A0 access module</b>	<b>6DD1660-0BH1</b>

#### Technical specifications

##### CP52M0

##### Power supply

Voltage/current supply (at 25 °C)	+5 V typ. 0.4 A +3.3 V typ. 0.7 A +12 V typ. 0.01 A -12 V typ. 0.01 A
-----------------------------------	--

Power loss, typical	4.5 W
---------------------	-------

Space requirement / width	1 slot
---------------------------	--------

Weight	0.6 kg
--------	--------

##### Digital outputs

Number	16
--------	----

Electrical isolation	No
----------------------	----

##### External power supply voltage

• Rated value	24 V
• Permissible range	20 to 30
• Briefly	35 V, for max. 0.5 s
• Max. current drain (without load)	40 mA

##### Output voltage range

• For a 0-signal, max.	3 V
• For a 1-signal min	External power supply -2.5 V

##### Output current

• For a 0-signal, min.	-20 µA
• For a 1-signal	
- Nominal value	50 mA
- Permissible range, max.	100 mA

Delay time	100 µs
------------	--------

Max. switching frequency of the outputs for an ohmic load	6 kHz
---	-------

##### Short-circuit protection with respect to

• Ground	Yes
• Ext. power supply	No

Max. short-circuit current	250 mA
----------------------------	--------

Summed current of the outputs (up to 60 °C)	16 x 50 mA
---	------------

Limiting, of inductive switch-off voltages	External power supply voltage + 1 V
--	-------------------------------------

##### CP52IO

##### Power supply

Voltage/current supply (at 25 °C)	+5 V typ. 3 A +3.3 V typ. 0.8 A
-----------------------------------	------------------------------------

Power loss, typical	18 W
---------------------	------

Space requirement / width	1 slot
---------------------------	--------

Weight	0.6 kg
--------	--------

##### CP52A0

##### Power supply

Voltage/current supply (at 25 °C)	+5 V typ. 1.5 A +3.3 V typ. 0.4 A
-----------------------------------	--------------------------------------

Power loss, typical	9 W
---------------------	-----

Space requirement / width	1 slot
---------------------------	--------

Weight	0.6 kg
--------	--------

### Overview SB10 interface module



May deviate from figure.

The interface module is used to connect 8 digital inputs or outputs.

### Overview SB70 interface module



The interface module is used to connect 8 digital outputs with conversion of the 24 V DC voltage on the module side to a max. of 120 V DC/AC on the plant side using relays.

### Overview SB60 interface module



Interface module for connecting 8 digital inputs with 120 V DC/AC to 24 V DC conversion.

### Overview SB71 interface module



The interface module is used to connect 8 digital outputs with conversion of the module-side 24 V DC to system-side max. 24/48 V DC by means of transistors.

### Overview SB61 interface module



It is used to connect 8 digital inputs with conversion from 24/48 V DC to 24 V DC.

### Overview SC62 interface cable



Cable for connecting the SIMATIC TDC SM500 I/O module or SIMATIC S7-400 EXM 438-1 expansion module with up to five SB10, SB60, SB70, SB61 SB71 and/or SU12 interface modules.

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### Accessories

##### Overview SC63 interface cable



Cable for connecting the SIMATIC TDC SM500 I/O module or SIMATIC S7-400 EXM 438-1 expansion module with an SU13 interface module.

##### Overview SC67 service cable



Service cable for the SIMATIC TDC CPU551 processor module and a local configuration / service PC.

##### Overview SC64 interface cable



May deviate from figure

Interface cable for FM 458-1 DP basic module and SB10, SB60, SB61 and SU12 interface modules.

##### Overview SU12 interface module



The interface module is used to connect 10 signals; there is no electronic conversion.

##### Overview SC66 interface cable



Interface cable for the SIMATIC TDC CPU551 processor module and the SB10, SB60, SB61 and SU12 interface modules

##### Overview SU13 interface module



This interface module can be used to connect 50 signals; there is no electronic conversion.

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### Accessories

Ordering data	Article No.		Article No.
<b>SB10 interface module</b> 8 digital inputs/outputs, 24 V DC	<b>6DD1681-0AE2</b>	<b>SC63 interface cable</b> between SM500 or EXM 438-1 module and SU13 interface module, 2 m long	<b>6DD1684-0GD0</b>
<b>SB60 interface module</b> 8 digital inputs, 120 V AC	<b>6DD1681-0AF4</b>	<b>SC64 interface cable</b> between FM 458-1 DP (X2) module with SBxx or SU12 interface module, 2 m long	<b>6DD1684-0GE0</b>
<b>SB61 interface module</b> 8 digital inputs, 24/48 V DC	<b>6DD1681-0EB3</b>	<b>SC66 interface cable</b> between CPU551 and interface module SB10, SB60, SB61 or SU12, 2 m long	<b>6DD1684-0GG0</b>
<b>SB70 interface module</b> 8 digital outputs with relays	<b>6DD1681-0AG2</b>	<b>SC67 service cable</b> between CPU551 and PG/PC, 7 m long	<b>6DD1684-0GH0</b>
<b>SB71 interface module</b> 8 digital outputs with transistors, 24/48 V DC	<b>6DD1681-0DH1</b>	<b>SU12 interface module</b> with plug-in connector, 10-pole	<b>6DD1681-0AJ1</b>
<b>SC62 interface cable</b> between SM500 or EXM 438-1 module and max. 5 SB10, SB60, SB70, SB61, SB71 and/or SU12 interface modules, 2 m long	<b>6DD1684-0GC0</b>	<b>SU13 interface module</b> with screw-type plug-in connector	<b>6DD1681-0GK0</b>

**SIMATIC control systems**

## SIMATIC TDC multiprocessor control system

## Accessories

**Technical specifications****Technical data for interface module SB 10**

Number of digital inputs/outputs	8
Galvanic isolation	No
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.3 kg

**Technical data for interface module SB 60**

Number of digital inputs	8
• Input voltage	120 V DC/AC
Insulation voltage	<ul style="list-style-type: none"> <li>• Safe isolation assured between inputs and outputs</li> <li>• Galvanic isolation assured between input circuits</li> <li>• 1125 V AC test voltage</li> </ul>
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.31 kg

**Technical data for interface module SB 61**

Number of digital inputs	8
• Input voltage	24/48 V DC
Galvanic isolation	Yes, via optocoupler
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg

**Technical data for interface module SB 70**

Number of digital outputs	8
• Output voltage, max.	120 V DC/AC
Relay switching current	
• At 120 V AC	2 A
• At 120 V DC	0.2 A
Galvanic isolation	via relay
Insulation voltage	<ul style="list-style-type: none"> <li>• Safe isolation assured between inputs and outputs</li> <li>• Galvanic isolation assured between input circuits</li> <li>• 1125 V AC test voltage</li> </ul>
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg

**Technical data for interface module SB 71**

Number of digital outputs	8
• Output voltage, max.	24/48 V DC
Output current, max.	40 mA, short-circuit proof
Galvanic isolation	Yes, via optocoupler
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg

**Technical data for interface module SU 12**

Number of connectable signal lines	10
Signal strength per signal, max.	60 V, 0.5 A
Galvanic isolation	No
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.28 kg

**Technical data for interface module SU 13**

Number of connectable signal lines	50
Signal strength per signal, max.	60 V, 0.5 A
Galvanic isolation	No
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.3 kg

## Software for SIMATIC Controllers

**12/2 Introduction**

- 12/2 Information on software licensing
- 12/2 Software Update Service

**12/3 TIA Portal**

- 12/3 PLC programming
- 12/3 STEP 7 Basic (TIA Portal)
- 12/5 STEP 7 Professional (TIA Portal)
- 12/8 STEP 7 (TIA Portal) options
  - 12/8 - STEP 7 Safety (TIA Portal)
  - 12/10 - S7-PLCSIM Advanced
  - 12/12 - ODK 1500S
  - 12/13 - Target for Simulink
  - 12/14 - SIMATIC Safe Kinematics
  - 12/15 - SIMATIC Kinematics Operate
  - 12/16 - PID Professional (TIA Portal)
  - 12/17 - Easy Motion Control (TIA Portal)
  - 12/18 - OPC UA S7-1200/S7-1500
- 12/19 TIA Portal options
- 12/19 TIA Portal Multiuser Engineering
- 12/20 TIA Portal Test Suite
- 12/21 TIA Portal Cloud Connector
- 12/22 TIA Portal Teamcenter Gateway
- 12/23 SIMATIC Visualization Architect
- 12/24 SIMATIC ProDiag
- 12/25 SIMATIC Modular Application Creator
- 12/26 Central user management (UMC)

**12/27 STEP 7 V5.x**

- 12/27 Basic software and editors
- 12/27 STEP 7
- 12/29 STEP 7 Professional
- 12/32 S7-SCL
- 12/34 S7-GRAPH
- 12/36 S7-PLCSIM
- 12/37 Options for programming and design
- 12/37 CFC
- 12/39 S7 Distributed Safety
- 12/40 Safety Integrated for Process Automation
  - 12/42 - SIMATIC S7 F Systems
  - 12/44 - SIMATIC S7 Safety Matrix
- 12/46 Software redundancy
- 12/47 SIMATIC iMap
- 12/49 DOCPRO
- 12/50 Options for diagnostics and service
- 12/50 S7-PDIAG
- 12/51 PRODAVE
- 12/52 Options for technology and drive systems
- 12/52 Loadable function blocks
  - 12/52 - Standard PID Control
  - 12/54 - Modular PID Control
  - 12/57 - PID Self-Tuner
- 12/58 S7-Technology
- 12/59 Easy Motion Control
- 12/60 D7-SYS
- 12/61 Drive ES engineering software

**12/62 Software for common tasks**

- 12/62 For network planning/commissioning
- 12/62 SINETPLAN 2.0 network planning
- 12/63 PROFINET Asset Management
- 12/63 PRONETA Professional
- 12/64 For maintenance
- 12/64 SIMATIC Automation Tool
- 12/66 SIMATIC PDM
- 12/72 For administration
- 12/72 Central user management (UMC)
- 12/73 SIMATIC Version Cross Manager
- 12/74 Version Trail

## Software for SIMATIC Controllers

### Introduction

#### Information on software licensing, Software Update Service

##### Overview Licensing

###### **Software types**

Siemens Digital Industry offers various types of software license.

For more information, see catalog section 17, page 17/14.

##### Overview Software Update Service

- Service for automatic dispatch of all new software versions during contract lifetime
- Reduced logistics effort thanks to automatic contract extension
- Reduced costs as updates are provided free of charge

###### **Ordering**

- The Software Update Service is ordered in the same way as any other product. The corresponding order number is given in the ordering information of the software product in question.
- You must own the current version of the software.
- One Software Update Service is ordered for each software license installed.
- The Software Update Service runs for 1 year from date of order.
- It is extended automatically by a further year in each case, as long as it is not canceled 3 months before it expires.
- An annual lump sum is invoiced per license.

##### Application

SIMATIC Software is continuously enhanced and improved. The **Software Update Service** (previously: software maintenance service) is the easiest way to regularly take advantage of these improvements. It ensures automatic delivery of all new software versions that are released after ordering the Software Update Service so that your software is always up to date.

The Software Update Service

- Saves time and effort:  
Once it is ordered, the Software Update Service is automatically renewed every year.
- Lowers costs:  
The service pays for itself after the first update as it costs less than an individually ordered update.
- Makes budgeting easier:  
Software expenditures can be accounted for early in the budgeting process and they are easier to write off.

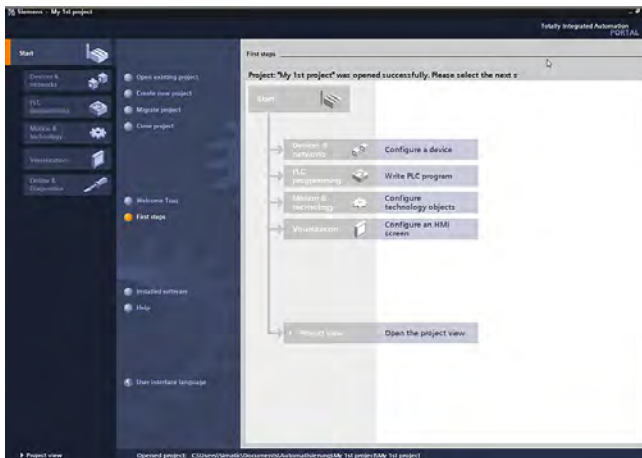
##### Design

###### **Scope of supply**

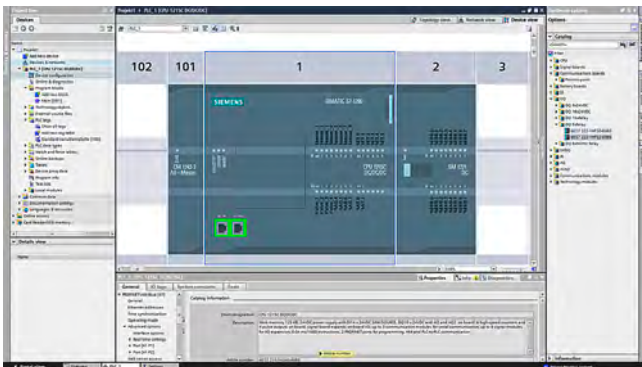
- All new software versions that are released after ordering the Software Update Service (usually several deliveries per year)
- CD-ROM SIMATIC Customer Support Knowledge Base with FAQs, tips & tricks and downloads (several times per year).



## Overview



STEP 7 Basic V17 (TIA Portal), portal view



STEP 7 Basic V17 (TIA Portal), device view: Configuring and parameterizing in realistic photo-quality representation

**Intuitive, efficient and future-oriented - the engineering software for programming SIMATIC Controllers**

SIMATIC STEP 7 Basic V17 is the engineering system for the SIMATIC S7-1200.

STEP 7 Basic V17 is based on the Totally Integrated Automation Portal (TIA Portal) central engineering framework which offers users a uniform, efficient and intuitive solution to all automation tasks.

**New with V17**

- New programming language Cause Effect Matrix (CEM) for efficient and fast programming in a connection matrix
- Download and upload of the folder structure for program blocks, PLC data types and PLC tags to the PLC
- Extended functions for the cross-references (freeze the display, show access to higher-level structures, improved display of PLC tags with overlapping input or output addresses)
- Extended functions for TIA Portal Openness
- Improved performance and support of new CPUs in PLCSIM
- Offline/offline comparison of the hardware configuration up to the parameter level
- Innovated type instance and versioning concept for blocks in TIA Portal libraries
- Extended functions of TIA Portal user management: Introduction of engineering function rights, anonymous users without password, locking of open projects, ...

**Licensing**

- STEP 7 Basic V17 is supplied with a floating license. The floating license allows the software to be used on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- Existing STEP 7 Basic licenses of versions V11-V16 can be upgraded to V17. This requires an upgrade license.
- A STEP 7 Basic V17 license can be upgraded to a STEP 7 Professional V17 license with a PowerPack.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

**Ordering data****Article No.****STEP 7 Basic V17**

Target system:  
SIMATIC S7-1200, S7-1500,  
S7-300, S7-400, WinAC

Requirement:

- Windows 10 (64-bit)
- Windows 10 Home Version 1909, 2004, 20H2
  - Windows 10 Professional Version 1909, 2004, 20H2
  - Windows 10 Enterprise Version 1909, 2004, 20H2
  - Windows 10 IoT Enterprise 2016 LTSC
  - Windows 10 IoT Enterprise 2019 LTSC

Windows Server (64-bit)

- Windows Server 2016 Standard (full installation)
- Windows Server 2019 Standard (full installation)

Type of delivery:

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

**STEP 7 Basic V17, floating license**

**6ES7822-0AA07-0YA5**

**STEP 7 Basic V17, software download including license key<sup>1)</sup>**

**6ES7822-0AE07-0YA5**

Consignee email address required for delivery

**STEP 7 Basic/Professional V17, trial license**

**6ES7822-1AA07-0YA7**

**Upgrade from STEP 7 Basic V11...V16 to STEP 7 Basic V17, floating license**

**6ES7822-0AA07-0YE5**

**Upgrade from STEP 7 Basic V11...V16 to STEP 7 Basic V17, floating license, software download incl. license key<sup>1)</sup>**

**6ES7822-0AE07-0YE5**

Consignee email address required for delivery

**PowerPack STEP 7 Basic V17 to STEP 7 Professional V17, floating license**

**6ES7822-1AA07-0YC5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# Software for SIMATIC Controllers

TIA Portal

PLC programming

## STEP 7 Basic (TIA Portal)

### Ordering data

### Article No.

**PowerPack STEP 7 Basic V17 to STEP 7 Professional V17, floating license, software download including license key<sup>1)</sup>**

6ES7822-1AE07-0YC5

Consignee email address required for delivery

#### Software Update Service

For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version

#### Software Update Service (Standard Edition)<sup>2)</sup>

The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)

- STEP 7 Basic

6ES7822-0AA00-0YLO

#### Software Update Service (Compact Edition)<sup>2)</sup>

The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied.

Delivery items to be combined must be ordered as one item.

- STEP 7 Basic

6ES7822-0AA00-0YMO

#### Software Update Service (Download)<sup>2)</sup>

Upgrades and Service Packs are available for downloading.

Consignee email address required for delivery

- STEP 7 Basic

6ES7822-0AE00-0YYO

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

<sup>2)</sup> For more information on the Software Update Service, see page 12/2.

### Technical specifications

STEP 7 Basic V17 (TIA Portal)	
Type of license	Floating license
Software class	A
Current version	V17
Target system	SIMATIC S7-1200
Operating systems	Windows 10 (64-bit) <ul style="list-style-type: none"> <li>• Windows 10 Home Version 1909, 2004, 20H2</li> <li>• Windows 10 Professional Version 1909, 2004, 20H2</li> <li>• Windows 10 Enterprise Version 1909, 2004, 20H2</li> <li>• Windows 10 IoT Enterprise 2016 LTSB</li> <li>• Windows 10 IoT Enterprise 2019 LTSC</li> </ul> Windows Server (64-bit) <ul style="list-style-type: none"> <li>• Windows Server 2016 Standard (full installation)</li> <li>• Windows Server 2019 Standard (full installation)</li> </ul>
Recommended PC hardware	
Computer	SIMATIC Field PG M6 Advanced or higher (or comparable PC)
Processor	Intel Core i5-8400H (up to 4.2 GHz)
RAM	16 GB or more (min. 8 GB, 32 GB for large projects)
Hard disk	SSD with at least 50 GB storage space available
Network	1 Gbit (for multi-user)
Screen	15.6" full HD display (1920 x 1080 or higher)

### Compatibility with other SIMATIC products

STEP 7 V17 can be installed on a PC in parallel with other versions of STEP 7 V13 SSP2 to V16 and STEP 7 V5.6 or higher.

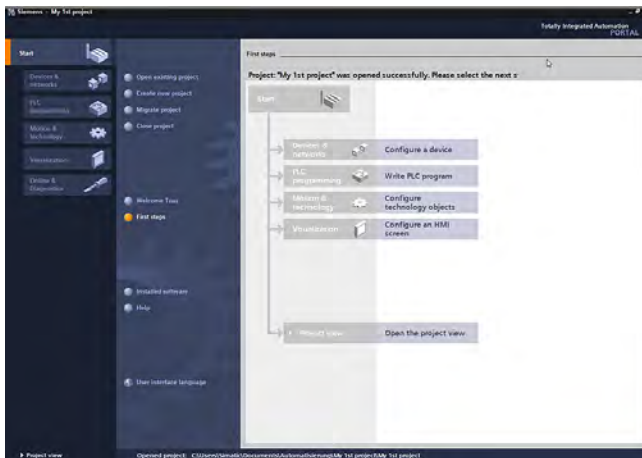
As of TIA Portal project version V13 SP1, projects can be directly upgraded to V17. Upgrading of projects from previous project versions (V11 ... V13) is carried out on the basis of the TIA Portal products (e.g. STEP 7) used in the project in version V13 SP1 or V13 SP2 (latest update recommended).

### Important note

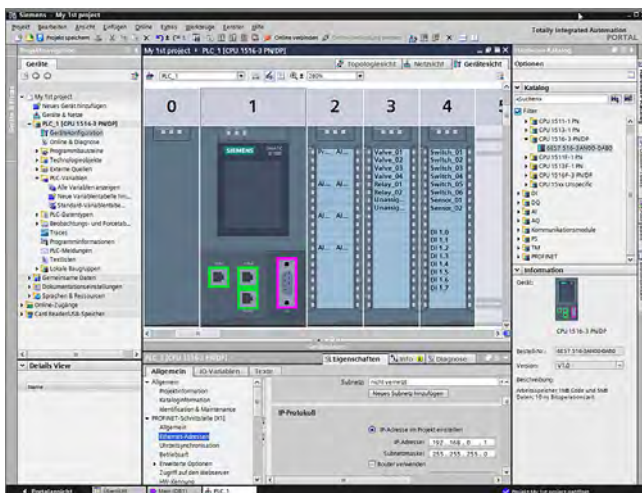
TIA Portal project versions V13 SP1.. V16 are upgraded with TIA Portal V17 to the project version V17. If you need to edit a TIA Portal project version V13 SP1.. V16, we recommend an additional installation of the corresponding software to TIA Portal V17. The license purchased for V17 is also valid for all older TIA Portal versions.

Program code and hardware configuration from STEP 7 V5.4 SP5 can be migrated directly to a TIA Portal V17 project with STEP 7 V17.

## Overview



STEP 7 Professional V17 (TIA Portal), portal view



STEP 7 Professional V17 (TIA Portal), device view: Configuring and parameterizing in realistic photo-quality representation

### Intuitive, efficient and future-oriented - the engineering software for programming the SIMATIC Controllers

SIMATIC STEP 7 Professional V17 is the engineering system for the SIMATIC S7-1200, S7-1500, S7-300, S7-400 Controllers, WinAC and Software Controllers.

STEP 7 V17 is based on the Totally Integrated Automation Portal (TIA Portal) central engineering framework which offers users a uniform, efficient and intuitive solution to all automation tasks.

#### New with V17

- New programming language Cause Effect Matrix (CEM) for efficient and fast programming in a connection matrix
- Download and upload of the folder structure for program blocks, PLC data types and PLC tags to the PLC
- Extended functions for the cross-references (freeze the display, show access to higher-level structures, improved display of PLC tags with overlapping input or output addresses)
- Extended functions for TIA Portal Openness
- Improved performance and support of new CPUs in PLCSIM
- Offline/offline comparison of the hardware configuration up to the parameter level
- Innovated type instance and versioning concept for blocks in TIA Portal libraries
- Extended functions of TIA Portal user management: Introduction of engineering function rights, anonymous users without password, locking of open projects, ...

#### Licenses

- STEP 7 Professional V17 is supplied with a STEP 7 Professional V17 floating license. The floating license allows the software to be used on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- Existing STEP 7 Professional licenses of versions V11-V16 can be upgraded to V17. This requires an upgrade license.
- The user receives a combo license when upgrading from STEP 7 V5.x. The combo license enables engineering to be performed both on the STEP 7 V 5.x and the STEP 7 V17 platform.
- The STEP 7 Basic V17 license can be upgraded to a STEP 7 Professional V17 license with a PowerPack.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

# Software for SIMATIC Controllers

TIA Portal

PLC programming

## STEP 7 Professional (TIA Portal)

### Ordering data

#### STEP 7 Professional V17

Target system:  
SIMATIC S7-1200, S7-1500,  
S7-300, S7-400, WinAC

Requirement:

- Windows 10 (64-bit)
- Windows 10 Professional  
Version 1909, 2004, 20H2
  - Windows 10 Enterprise  
Version 1909, 2004, 20H2
  - Windows 10 IoT Enterprise 2016  
LTSC
  - Windows 10 IoT Enterprise 2019  
LTSC
- Windows Server (64-bit)
- Windows Server 2016 Standard  
(full installation)
  - Windows Server 2019 Standard  
(full installation)

Type of delivery:

9 languages: de, en, zh included, fr,  
sp, it, ru, jp, kr as download

**STEP 7 Professional V17,  
floating license** **6ES7822-1AA07-0YA5**

**STEP 7 Professional V17,  
floating license,  
software download including  
license key <sup>1)</sup>** **6ES7822-1AE07-0YA5**

Consignee email address required  
for delivery

**STEP 7 Professional V17/2021  
Combo, floating license** **6ES7810-5CC14-0YA5**

**STEP 7 Professional V17/2021  
Combo, floating license,  
software download incl.  
license key <sup>1)</sup>** **6ES7810-5CE14-0YB5**

Consignee email address required  
for delivery

**STEP 7 Professional V17,  
trial license** **6ES7822-1AA07-0YA7**

#### Conversion package STEP 7 Professional V17

Only valid if ordered together  
with Software Update  
Service 6ES7 810-5CC04-0YE2  
(STEP 7 Professional and  
STEP 7 Professional in TIA Portal).

- PowerPack & upgrade from  
STEP 7 V5.7 to  
STEP 7 Professional V17/2021  
Combo, floating license.  
STEP 7 Software Update Service  
is a prerequisite.
- PowerPack & upgrade from  
STEP 7 V5.7 to  
STEP 7 Professional V17/2021  
Combo, floating license.  
STEP 7 Software Update Service  
is a prerequisite.  
Software download including  
license key <sup>1)</sup>  
Consignee email address  
required for delivery

**6ES7822-1AA07-0XC2**

**6ES7822-1AE07-0XC2**

**Upgrade from  
STEP 7 Professional V11...16 to  
STEP 7 Professional V17 or  
STEP 7 Professional  
V11...V16/201x Combo to  
V17/2021 Combo  
or STEP 7 Professional  
2006...2010 to V17/2021 Combo,  
floating license**

**6ES7822-1AA07-0YE5**

**Upgrade from  
STEP 7 Professional V11...16 to  
STEP 7 Professional V17 or  
STEP 7 Professional  
V11...V16/201x Combo to  
V17/2021 Combo or  
STEP 7 Professional 2006...2010  
to V17/2021 Combo,  
floating license  
Software download including  
license key <sup>1)</sup>**

**6ES7822-1AE07-0YE5**

Consignee email address required  
for delivery

**PowerPack  
STEP 7 Professional V17 Trial 365  
to STEP 7 Prof. V17,  
floating license.**

**6ES7822-1BE07-0YC5**

Only valid if ordered together  
with Software Update  
Service 6ES7 822-1AE00-0YY0  
(STEP 7 Professional V1x)  
Prerequisite is a STEP 7 V17  
Trial 365 license.  
License key download <sup>1)</sup>  
Consignee email address required  
for delivery

**50 hours of engineering with  
STEP 7 Professional Combo,  
WinCC Professional  
(incl. WinCC flexible 2008)  
and STEP 7 Safety Advanced  
(incl. Distributed Safety),  
floating license  
Software download incl.  
license key <sup>1)</sup>**

**6ES7823-1GE07-0YA5**

Consignee email address required  
for delivery

**PowerPack & upgrade from  
STEP 7 V5.3...V5.7 to  
STEP 7 Professional V17/2021  
Combo, floating license**

**6ES7822-1AA07-0XC5**

**PowerPack & upgrade from  
STEP 7 V5.43...V5.7 to  
STEP 7 Professional V17/2021  
Combo, floating license  
Software download including  
license key <sup>1)</sup>**

**6ES7822-1AE07-0XC5**

Consignee email address required  
for delivery

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Technical specifications												
<p><b>Software Update Service</b></p> <p>For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version</p>		<table border="1"> <thead> <tr> <th colspan="2">STEP 7 Professional V17 (TIA Portal)</th> </tr> </thead> <tbody> <tr> <td>Type of license</td> <td>Floating license</td> </tr> <tr> <td>Software class</td> <td>A</td> </tr> <tr> <td>Current version</td> <td>V17</td> </tr> <tr> <td>Target system</td> <td>SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC, Software Controllers</td> </tr> <tr> <td>Operating systems</td> <td>           Windows 10 (64-bit)           <ul style="list-style-type: none"> <li>• Windows 10 Professional Version 1909, 2004, 20H2</li> <li>• Windows 10 Enterprise Version 1909, 2004, 20H2</li> <li>• Windows 10 IoT Enterprise 2016 LTSC</li> <li>• Windows 10 IoT Enterprise 2019 LTSC</li> </ul>           Windows Server (64-bit)           <ul style="list-style-type: none"> <li>• Windows Server 2016 Standard (full installation)</li> <li>• Windows Server 2019 Standard (full installation)</li> </ul> </td> </tr> </tbody> </table>	STEP 7 Professional V17 (TIA Portal)		Type of license	Floating license	Software class	A	Current version	V17	Target system	SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC, Software Controllers	Operating systems	Windows 10 (64-bit) <ul style="list-style-type: none"> <li>• Windows 10 Professional Version 1909, 2004, 20H2</li> <li>• Windows 10 Enterprise Version 1909, 2004, 20H2</li> <li>• Windows 10 IoT Enterprise 2016 LTSC</li> <li>• Windows 10 IoT Enterprise 2019 LTSC</li> </ul> Windows Server (64-bit) <ul style="list-style-type: none"> <li>• Windows Server 2016 Standard (full installation)</li> <li>• Windows Server 2019 Standard (full installation)</li> </ul>
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<p><b>Software Update Service (Standard Edition)<sup>2)</sup></b></p> <p>The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)</p> <ul style="list-style-type: none"> <li>• STEP 7 Professional in the TIA Portal</li> <li>• STEP 7 Professional and STEP 7 Professional in the TIA Portal</li> </ul>	<p><b>6ES7822-1AA00-0YL5</b> <b>6ES7810-5CC04-0YE2</b></p>	<p><b>Recommended PC hardware</b></p> <table border="1"> <tbody> <tr> <td>Computer</td> <td>SIMATIC Field PG M6 Advanced or higher (or comparable PC)</td> </tr> <tr> <td>Processor</td> <td>Intel Core i5-8400H (up to 4.2 GHz)</td> </tr> <tr> <td>RAM</td> <td>16 GB or more (min. 8 GB, 32 GB for large projects)</td> </tr> <tr> <td>Hard disk</td> <td>SSD with at least 50 GB storage space available</td> </tr> <tr> <td>Network</td> <td>1 Gbit (for multi-user)</td> </tr> <tr> <td>Screen</td> <td>15.6" full HD display (1920 x 1080 or higher)</td> </tr> </tbody> </table>	Computer	SIMATIC Field PG M6 Advanced or higher (or comparable PC)	Processor	Intel Core i5-8400H (up to 4.2 GHz)	RAM	16 GB or more (min. 8 GB, 32 GB for large projects)	Hard disk	SSD with at least 50 GB storage space available	Network	1 Gbit (for multi-user)	Screen	15.6" full HD display (1920 x 1080 or higher)
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<p><b>Software Update Service (Compact Edition)<sup>2)</sup></b></p> <p>The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. Delivery items to be combined must be ordered as one item.</p> <ul style="list-style-type: none"> <li>• STEP 7 Professional in the TIA Portal</li> <li>• STEP 7 Professional and STEP 7 Professional in the TIA Portal</li> </ul>	<p><b>6ES7822-1AA00-0YM5</b> <b>6ES7810-5CC00-0YM2</b></p>													
<p><b>Software Update Service (Download)<sup>2)</sup></b></p> <p>Upgrades and Service Packs are available for downloading. Consignee email address required for delivery</p> <ul style="list-style-type: none"> <li>• STEP 7 Professional V1x</li> <li>• STEP 7 Professional and STEP 7 Professional in the TIA Portal</li> </ul>	<p><b>6ES7822-1AE00-0YY0</b> <b>6ES7810-5CC04-0YY2</b></p>	<p><b>Compatibility with other SIMATIC products</b></p> <p>STEP 7 V17 can be installed on a PC in parallel with other versions of STEP 7 V13 SP2 to V16 and STEP 7 V5.6 or higher.</p> <p>As of TIA Portal project version V13 SP1, projects can be directly upgraded to V17. Upgrading of projects from previous project versions (V11 ... V13) is carried out on the basis of the TIA Portal products (e.g. STEP 7) used in the project in version V13 SP1 or V13 SP2 (latest update recommended).</p> <p><u>Important note</u></p> <p>TIA Portal project versions V13 SP1.. V16 are upgraded with TIA Portal V17 to the project version V17. If you need to edit a TIA Portal project version V13 SP1.. V16, we recommend an additional installation of the corresponding software to TIA Portal V17. The license purchased for V17 is also valid for all older TIA Portal versions.</p> <p>Program code and hardware configuration from STEP 7 V5.4 SP5 can be migrated directly to a TIA Portal V17 project with STEP 7 V17.</p>												

<sup>2)</sup> For more information on the Software Update Service, see page 12/2.

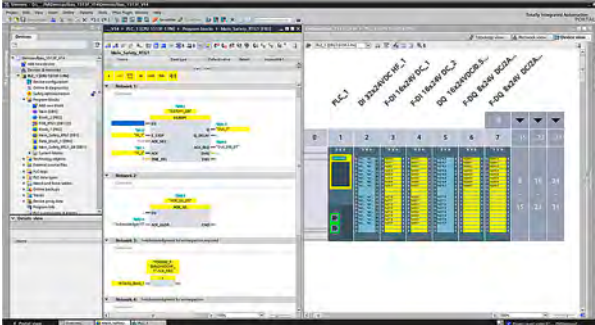
# Software for SIMATIC Controllers

TIA Portal

PLC programming

## STEP 7 (TIA Portal) options > STEP 7 Safety (TIA Portal)

### Overview



STEP 7 Safety Advanced, configuration and programming

- For creating safety-related programs on the STEP 7 user interface
- For seamless and easy to use integration of safety-related functions into the standard automation
- All the required configuration and programming tools are integrated into the STEP 7 user interface and utilize a common project structure
- STEP 7 Safety Basic option package for parameter assignment and programming of the fail-safe S7-1200 Basic Controller
- STEP 7 Safety Advanced option package for all fail-safe TIA SIMATIC controller classes (S7-1200, S7-1500, S7-1500 Software Controller, S7-300, S7-400, WinAC)

### Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- STEP 7 Safety Basic is a subset of STEP 7 Safety Advanced for programming the fail-safe S7-1200 F Basic Controller.
- Powerpacks can be used to upgrade an existing STEP 7 Safety Basic license.
- Combo licenses allow you to choose between programming with the predecessor product S7 Distributed Safety and STEP 7 Safety Advanced.
- An upgrade to a combo license is offered for the latest version of S7 Distributed Safety.
- Software Update Service (SUS) contracts can be concluded for both STEP 7 Safety Basic and STEP 7 Safety Advanced.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

### Ordering data

### Article No.

#### STEP 7 Safety Advanced V17

##### Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

##### Requirement:

STEP 7 Professional V17

##### Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup.

The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user;  
license key on USB flash drive

**6ES7833-1FA17-0YA5**

Floating license for 1 user,  
license key for download<sup>2)</sup>;  
Email address required for delivery

**6ES7833-1FA17-0YH5**

##### Software Update Service (Standard Edition)<sup>1)</sup>

**6ES7833-1FC00-0YX2**

The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.). Requires the current software version.

#### STEP 7 Safety Advanced V17 Combo

Delivery includes STEP 7 Safety Advanced V17 and S7 Distributed Safety V5.4 SP5 Update 2

Floating combo license for 1 user;  
software and documentation on DVD; license key on USB flash drive

**6ES7833-1FC17-0YA5**

Floating combo license for 1 user;  
software, documentation and license key for download<sup>2)</sup>;  
Email address required for delivery

**6ES7833-1FC17-0YH5**

##### Software Update Service

##### Software Update Service (Compact Edition)<sup>1)</sup>

**6ES7833-1FC00-0YM2**

The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. The deliveries that are to be grouped together must be ordered as a single item. Requires the current software version.

Minimum order quantity: 3 units

##### Software Update Service (Download)<sup>1)</sup>

**6ES7833-1FC00-0YY0**

Requires the current software version.

Email address required for delivery

<sup>1)</sup> For more information on the Software Update Service, see page 12/2.

<sup>2)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Article No.	
<p><b>STEP 7 Safety Advanced Upgrade</b></p> <p><u>Note:</u> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.</p> <p>Upgrade from Distributed Safety V5.4 SP5 or STEP 7 Safety Advanced V11..V16 (Combo) to STEP 7 Safety Advanced V17 (Combo) for parallel use of the versions; upgrade of combo license for 1 user; license key on USB flash drive</p> <p>Upgrade from Distributed Safety V5.4 SP5 or STEP 7 Safety Advanced V11..V16 (Combo) to STEP 7 Safety Advanced V17 (Combo) for parallel use of the versions; upgrade of combo license for 1 user; license key for download<sup>2)</sup>; Email address required for delivery</p>	<p><b>6ES7833-1FA17-0YF5</b></p> <p><b>6ES7833-1FA17-0YY5</b></p>	<p><b>STEP 7 Safety Basic Upgrade</b></p> <p><u>Note:</u> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.</p> <p>Upgrade from STEP 7 Safety Basic V13 SP1...V16 to STEP 7 Safety Basic V17 for parallel use of the versions; upgrade license for 1 user; license key on USB flash drive;</p> <p>Upgrade from STEP 7 Safety Basic V13 SP1...V16 to STEP 7 Safety Basic V17 for parallel use of the versions; upgrade license for 1 user; license key for download<sup>2)</sup>; Email address required for delivery</p> <p><u>Software Update Service (Standard Edition)</u><sup>1)</sup></p> <p>The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.). Requires the current software version.</p> <p><u>Software Update Service (Compact Edition)</u><sup>1)</sup></p> <p>The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. The deliveries that are to be grouped together must be ordered as a single item. Requires the current software version.</p> <p>Minimum order quantity: 3 units</p> <p><u>Software Update Service (Download)</u><sup>1)</sup></p> <p>Requires the current software version. Email address required for delivery</p>	<p><b>6ES7833-1FB17-0YE5</b></p> <p><b>6ES7833-1FB17-0YK5</b></p> <p><b>6ES7833-1FD00-0YX2</b></p> <p><b>6ES7833-1FD00-0YM2</b></p> <p><b>6ES7833-1FD00-0YN2</b></p>
<p><b>STEP 7 Safety Advanced PowerPack</b></p> <p>PowerPack STEP 7 Safety Basic V17 to STEP 7 Safety Advanced V17; floating license for 1 user; license key on USB flash drive</p> <p>PowerPack STEP 7 Safety Basic V17 to STEP 7 Safety Advanced V17; floating license for 1 user; license key for download<sup>2)</sup>; Email address required for delivery</p>	<p><b>6ES7833-1FA17-0YC5</b></p> <p><b>6ES7833-1FA17-0YJ5</b></p>		
<p><b>STEP 7 Safety Basic V17</b></p> <p><u>Task:</u> Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC</p> <p><u>Requirement:</u> STEP 7 Basic V17 or higher</p> <p><u>Note:</u> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.</p> <p>Floating license for 1 user; license key on USB flash drive</p> <p>Floating license for 1 user; license key for download<sup>2)</sup>; Email address required for delivery</p>	<p><b>6ES7833-1FB17-0YA5</b></p> <p><b>6ES7833-1FB17-0YH5</b></p>		

<sup>1)</sup> For more information on the Software Update Service, see page 12/2.

<sup>2)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Software for SIMATIC Controllers

TIA Portal

PLC programming

### STEP 7 (TIA Portal) options > S7-PLCSIM Advanced

#### Overview

With SIMATIC S7-PLCSIM Advanced, virtual controllers can be used for simulation of S7-1500 and ET 200SP Controllers and for extensive function simulation.

The virtual controllers can also be tested and validated in conjunction with a plant/machine. An extensive API is available for interfacing plant/machine simulations.

#### New with V4.0

- The control code for the following SIMATIC PLCs can now be loaded directly and simulated with S7-PLCSIM Advanced:
  - SIMATIC S7-1500 H/R CPUs
  - SIMATIC ET 200pro CPUs
  - SIMATIC Drive Controller S7-1504 D TF and S7-1507 D TF
  - SIMATIC S7-1518 T/TF
  - SIMATIC S7-SIPLUS CPUs (equivalents of the supported standard CPU types)
- Expansion of communication capabilities similar to hardware CPU S7-1500 with firmware version V2.9:
  - Support of up to 128 UDP multicast connections
  - DHCP and DNS support
- Secure communication...
  - Via Secure Open User Communication (secure TCP communication) as of STEP 7 V17
  - Via OPC UA Server as of STEP 7 V17
  - Via HTTPS connections to the web server as of STEP 7 V17
- TCP/IP communication with NpCap:
  - The WinPcab TCP/IP driver has been replaced by the current NpCap version, which is now automatically included in installation via the setup.

#### Licensing

- The engineering software can be installed on multiple computers. The number of licenses acquired determines the number of computers on which the software can be used simultaneously (floating license). For each license, the use of two simultaneously started S7-PLCSIM Advanced instances is permitted.
- An upgrade to version 4.0 is available for users of the previous 1.0/2.x/3.0 versions.
- It is also possible to procure the software as an annual subscription.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### SIMATIC S7-PLCSIM Advanced V4.0

Option for simulation of S7-1500 and ET 200SP

Floating license, software and documentation on DVD; license key on USB flash drive

**6ES7823-1FA03-0YA5**

Floating license, software, documentation and license key for download <sup>1)</sup>

**6ES7823-1FE03-0YA5**

Email address required for delivery

##### Upgrade

Upgrade from SIMATIC S7-PLCSIM Advanced V1.0/V2.x/V3.0 to V4.0, floating license

**6ES7823-1FA03-0YE5**

Upgrade from SIMATIC S7-PLCSIM Advanced V1.0/V2.x/V3.0 to V4.0, floating license for download <sup>1)</sup>;

**6ES7823-1FE03-0YE5**

Email address required for delivery

##### Software Subscription Service

SIMATIC S7-PLCSIM Advanced Subscription Download, single license, software, documentation and license key for download <sup>1)</sup>

**6ES7823-1FE00-0YN5**

Email address required for delivery

##### Software Update Service<sup>2)</sup>

For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version.

Software Update Service: Upgrades and Service Packs are provided in the form of DVDs, USB flash drives etc.

**6ES7823-1FA00-0YL5**

Software Update Service (Download)<sup>1)</sup>

Upgrades and Service Packs are available for downloading.

**6ES7823-1FE00-0YL5**

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

<sup>2)</sup> For more information on the Software Update Service, see page 12/2.



**Technical specifications****Minimum requirements for use**

Hardware / software	Requirements
Processor	<ul style="list-style-type: none"> <li>• One logical Intel Core™ i7 6th generation core for each started instance</li> <li>• At least one additional core for the operating system</li> <li>• At least one additional core for additional active applications</li> </ul>
RAM	<ul style="list-style-type: none"> <li>• 1 GB for each started instance</li> <li>• At least 4 GB for the Windows operating system</li> <li>• Additional RAM work memory according to the requirements of the remaining active applications</li> </ul>
Free hard disk space	5 GB
Operating systems (64-bit version)	<ul style="list-style-type: none"> <li>• Windows 10 Home Version 1909</li> <li>• Windows 10 Home Version 2004</li> <li>• Windows 10 Home Version 2009/20H2</li> <li>• Windows 10 Professional Version 1909</li> <li>• Windows 10 Professional Version 2004</li> <li>• Windows 10 Professional Version 2009/20H2</li> <li>• Windows 10 Enterprise Version 1909</li> <li>• Windows 10 Enterprise Version 2004</li> <li>• Windows 10 Enterprise Version 2009/20H2</li> <li>• Windows 10 Enterprise 2016 LTSC</li> <li>• Windows 10 Enterprise 2019 LTSC</li> <li>• Windows Server 2016 Standard (full installation)</li> <li>• Windows Server 2019 Standard (full installation)</li> </ul>
Screen resolution	min. 1024 x 768

Compatibility with other products

- S7-PLCSIM Advanced V4.0 and S7-PLCSIM V17 can be installed and operated on the same PC or the same virtual machine. Communication between the two applications cannot be simulated.
- Compatible with TIA Portal projects from versions V14 to V17
- Support of the CPU firmware versions V1.8 to V2.9

## Software for SIMATIC Controllers

TIA Portal

PLC programming

### STEP 7 (TIA Portal) options > ODK 1500S

#### Overview

- For developing dynamically loadable function libraries for the S7-1500 Software Controllers and S7-1500 Advanced Controllers CPU 1518 MFP and PLCSIM Advanced:
  - Implementation of function libraries for the SIMATIC S7-1500 Software Controller that are executed under Windows with the high-level languages C/C++, C# and VB
  - Implementation of function libraries for the PLCSIM Advanced that are executed under Windows with the high-level languages C/C++
  - Implementation of function libraries that are executed in real-time in the context of the user program of the CPU with the high-level language C++
  - Implementation of applications for the C++ runtime of the CPU 1518 MFP
- "Eclipse" development environment for real-time function libraries in the CPU user program and applications for the C++ runtime in the scope of delivery.
- Development of library functions under Windows with MS Visual Studio (optional)
- Easy introduction to development by using basic projects via templates
- Automatic creation of function blocks for calling the library functions
- Simple integration of the function blocks into STEP 7 by importing.
- Simple use of the library functions in the PLC without specific high-level language know-how.

#### Licensing

- ODK 1500S is supplied with a floating license. The floating license allows installation of the software on any number of computers. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 2.5 is offered for users of the previous versions 1.0 and 2.0.
- The integrated development environment Eclipse, required for developing real-time libraries, is included in the scope of supply of ODK 1500S as well as templates for Visual Studio.
- SIMATIC ODK 1500S is available as a standalone product or in a bundle with SIMATIC Target 1500S™ for Simulink®.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

##### SIMATIC ODK 1500S

Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; single license; supplied on DVD

Open Development Kit V2.0 for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; single license; software download <sup>1)</sup>

E-mail address required for delivery

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) <sup>1)</sup>

E-mail address required for delivery

Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as from V1.0; software download including license key (floating license) <sup>1)</sup>

E-mail address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

#### Article No.

6ES7806-2CD02-0YA0

6ES7806-2CD02-0YGO

6ES7806-2CD03-0YA0

6ES7806-2CD03-0YGO

6ES7806-2CD03-0YK0

#### Technical specifications

##### System requirements

The SIMATIC ODK 1500S can be used on PC platforms with the following requirements:

- Operating systems Windows 7/8.1/10
- Min. 3 GB hard disk memory
- Min. 4 GB work memory
- Mouse, keyboard, monitor

## Overview

SIMATIC Target™ is an add-on for the Simulink® software from The MathWorks. This makes it possible to also use model-based design with MATLAB® and Simulink for SIMATIC S7-1500 Controllers and SIMATIC Industrial Edge. For this purpose, executable code for all ODK-compatible S7-1500 Controllers (S7-1500 Software Controllers, ET 200SP Open Controllers, CPU 1518 ODK/MFP and PLCSIM Advanced as of V3.0) or the LiveTwin Edge app is generated directly from Simulink via SIMATIC Target.

### New with V5.0

- Code generation also for the LiveTwin Edge app. This means there is free choice as to whether the Simulink model should run in real time on an S7-1500 Controller or via LiveTwin on any SIMATIC Edge device. This is also why SIMATIC Target 1500S has been renamed SIMATIC Target.
- Support of the Embedded Coder® for code generation. The generated code can be optimized further with this.
- Support of Custom Storage Class for code generation.
- Simplified integration of the generated code in the S7-1500 user program.
- The S functions for the link between Simulink and PLCSIM Advanced are now supplied directly as Simulink library with SIMATIC Target.

### Licensing

- The engineering software can be installed on multiple computers. The number of licenses acquired determines the number of computers on which the software can be used simultaneously (floating license).
- SIMATIC Target™ for Simulink® V5.0 is available as a standalone product or in a bundle with the SIMATIC S7-1500 Software Controller Open Development Kit.
- An upgrade to latest versions is available for previous versions

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

## Ordering data

## Article No.

### SIMATIC Target for Simulink V5.0

6ES7823-1BE04-0YA5

Download incl. license key <sup>1)</sup>

Email address required for delivery

### Upgrade

6ES7823-1BE04-0YE5

Upgrade of SIMATIC Target 1500S for Simulink V2.0...V4.0 to V5.0, download incl. license key <sup>1)</sup>

Email address required for delivery

### SIMATIC Target + ODK 1500S bundle

6ES7823-1BE14-0YA0

Download incl. license key <sup>1)</sup>

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Technical specifications

### Requirements at the MATLAB end

MATLAB 2019b (64-bit) or more recent version

- MATLAB 9.7
- MATLAB Coder 4.3
- Simulink 10.0
- Simulink Coder 9.2

### Requirements at the SIMATIC end

SIMATIC ODK 1500S V2.0/V2.5

Must be installed together with target 1500S, MATLAB and Simulink on the same PC

STEP 7 Professional as of V15.1

For configuration of the S7-1500 CPUs, not essentially on the same PC as the target 1500S

Supported CPUs

- CPU 1507S(F) with firmware V2.0 or higher
- CPU 1515SP PC (F) with firmware V2.0 or higher
- CPU 1518 (F) ODK/MFP
- S7-PLCSIM Advanced as of V3.0

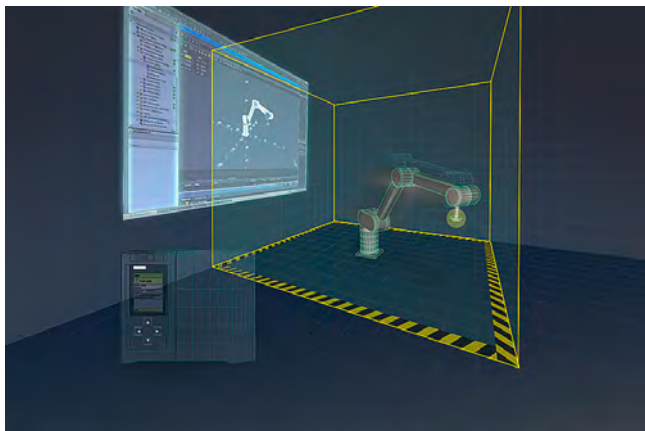
## Software for SIMATIC Controllers

TIA Portal

PLC programming

### STEP 7 (TIA Portal) options > SIMATIC Safe Kinematics

#### Overview



SIMATIC Safe Kinematics V2.0 enables safe monitoring of the movement in multidimensional space by pre-defined kinematics with up to 12 interpolating axes. The following monitoring functions are available:

- **Safe Speed Monitor:**  
Safe speed monitoring can be used to monitor the Cartesian speed of individual points in the kinematics, e.g. at the tool center point or at joints.
- **Safe Zone Monitor:**  
Safe zone monitoring is used to monitor the position of the kinematics in the Cartesian space, e.g. to limit the traversing range of the kinematics or to monitor areas that can be entered by operating personnel.
- **Safe Orientation Monitor:**  
Safe orientation monitoring enables monitoring of the orientation of the flange on user-defined serial kinematics, e.g. a workpiece may only be machined if the tool is perpendicular to the floor.

The following kinematics are supported:

- Cartesian portal
- Roller picker (vertical and horizontal)
- Delta pickers
- SCARA
- Articulated arm
- User-defined serial kinematics

SIMATIC Safe Kinematics V2.0 is an option package of the TIA Portal and is retro-installed as setup in the TIA Portal V16 as of Update 1.

The product contains a fail-safe block library that can be integrated in the STEP 7 Safety Advanced programming environment and can be connected on the input and output side.

SIMATIC Safe Kinematics V2.0 runs on the following PLCs:

- CPU 1517F-3 PN/DP with firmware version 2.8.x
- CPU 1518F-4 PN/DP with firmware version 2.8.x
- CPU 1517TF-3 PN/DP with firmware version 2.8.x
- CPU 1515SP PC2 TF with CPU 1505SP TF with firmware version 20.8.x

#### System requirements

- SIMATIC STEP 7 Professional (TIA Portal) V16 as of Update 1
- STEP 7 Safety Advanced V16

SIMATIC Safe Kinematics requires as a subordinate drive system SINAMICS S120 with CU320-2 as of firmware V5.1 with Safety Integrated Advanced Functions.

#### Licensing

- The software is supplied with a Single Runtime License. A license is required for each F-CPU on which SIMATIC Safe Kinematics runs.
- The software can only be ordered via Online Software Delivery (OSD). The download contains one license certificate and the TIA Portal installation setup for SIMATIC Safe Kinematics.
- The following additional licenses are required to use SIMATIC Safe Kinematics:
  - SIMATIC STEP 7 Professional (TIA Portal) V16
  - STEP 7 Safety Advanced V16
  - SINAMICS Safety Integrated Advanced Functions (for each monitored axis of the kinematics)

#### Ordering data

#### Article No.

##### SIMATIC Safe Kinematics V2.0

TIA Portal option package for safe monitoring of the movement of pre-defined kinematics with up to 12 interpolating axes in multidimensional space.

##### Requirement:

SIMATIC STEP 7 Professional (TIA Portal) V16 as of Update 1  
STEP 7 Safety Advanced V16

##### Runs on:

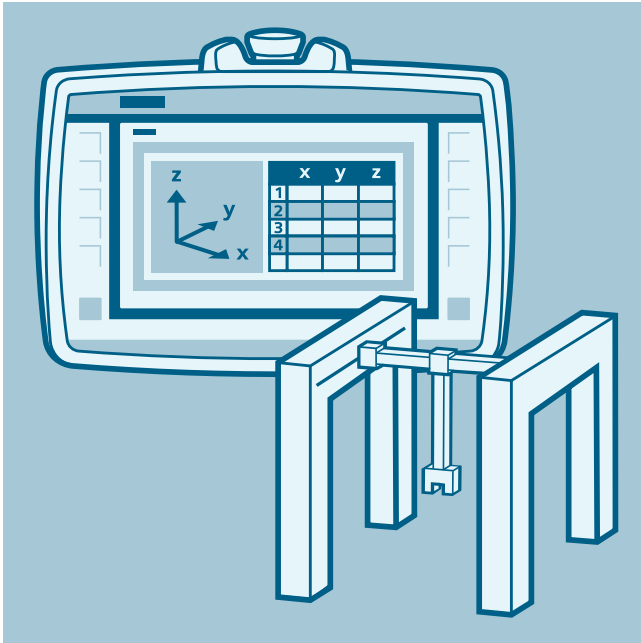
CPU 1517F-3 PN/DP with firmware version 2.8.x  
CPU 1518F-4 PN/DP with firmware version 2.8.x  
CPU 1517TF-3 PN/DP with firmware version 2.8.x  
CPU 1515SP PC2 TF with CPU 1505SP TF with firmware version 20.8.x

Single Runtime License Download<sup>1)</sup>; contains license certificate and installation setup for SIMATIC Safe Kinematics block library; Email address required for delivery

**6ES7823-0FE01-1AA0**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Overview



With SIMATIC Kinematics Operate, kinematics can be configured, programmed and operated with up to 6 positioning axes with synchronous point-to-point control (sPTP). The Plug & Play solution comprises a convenient user interface for programming, diagnostics and operation of the kinematics via HMI.

The SIMATIC Kinematics Operate V1.0 software solution consists of a TIA Portal project and an HMI project for TIA Portal as of V15.0.

SIMATIC Kinematics Operate V1.0 contains the following HMI configuration functions:

- Configuration of kinematics and additional axes; 6 axes are available in total for multi-axis positioning with sPTP. The axes not used in the multi-axis group can be created as independent single axes.
- Axis configuration; the dynamic parameters, the axis limits and the homing of the different axes can be configured.
- Tag and I/O configuration; Bool and Real tags can be created. Logical step enabling conditions consisting of multiple inputs and tags can be combined into one Boolean tag. Digital inputs and outputs can be configured via the I/O address.
- Points table; By means of input or teaching of axis positions, path points can be defined that can be used for programming the kinematics.
- Zone configuration; multiple restricted zones can be created in the workspace as protection zones. These are checked cyclically against both the target coordinates and the current axis values. A violation leads to a stop response of the axes

The program editor offers the following functions:

- Synchronous point-to-point commands; all axes are traversed synchronously with multi-axis positioning. The destination is specified either using the points table or by direct input with optional blending.
- Single axis commands; the additional axes can be homed, positioned, torque-limited or speed-controlled.
- Wait functions; Step enabling conditions, based on a digital input, a Bool tag or a wait time, can be programmed.
- Calculate tags and assign values; digital outputs can be set via an input mask. In addition, floating point tags can be calculated, incremented or assigned absolute values.
- Program control structures; labels, branches, loops and parallel sequences allow flexible program design.

SIMATIC Kinematics Operate can be run on SIMATIC S7-1500 CPU S7-1511T-1 PN. Alternatively, SIMATIC S7-1500 CPU S7-1512C-1 PN or a faster CPU can be used. Please refer to the operating instructions for details on scalability and the configuration limits.

### System requirements

- SIMATIC STEP 7 Professional (TIA Portal) as of V15
- SIMATIC WinCC Advanced ES as of V15

### Licensing

- SIMATIC Kinematics Operate is available as Runtime option for TIA Portal. A license is required for each CPU on which SIMATIC Kinematics Operate runs.
- The product can only be ordered via Online Software Delivery (OSD). The download contains the license certificate. The software is downloaded via the Siemens Industry Online Support Portal.
- The following additional licenses are required to use SIMATIC Safe Kinematics:
  - SIMATIC STEP 7 Professional (TIA Portal) as of V15
  - SIMATIC WinCC Advanced ES as of V15

### Ordering data

### Article No.

#### SIMATIC Kinematics Operate V1.0

TIA Portal Runtime option for configuring, programming and operation of kinematics with up to 6 positioning axes with synchronous point-to-point control (sPTP). Comprises a convenient user interface for programming, diagnostics and operation of the kinematics via HMI

#### Requirement:

SIMATIC STEP 7 Professional (TIA Portal) as of V15  
SIMATIC WinCC Advanced ES as of V15

#### Runs on:

SIMATIC S7-1500 CPU 1511T-1 PN  
SIMATIC S7-1500 CPU 1512C-1 PN  
or faster

Single Runtime License  
Download<sup>1)</sup>;  
contains license certificate;  
Email address required for delivery

**6ES7823-0GE00-1AA0**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

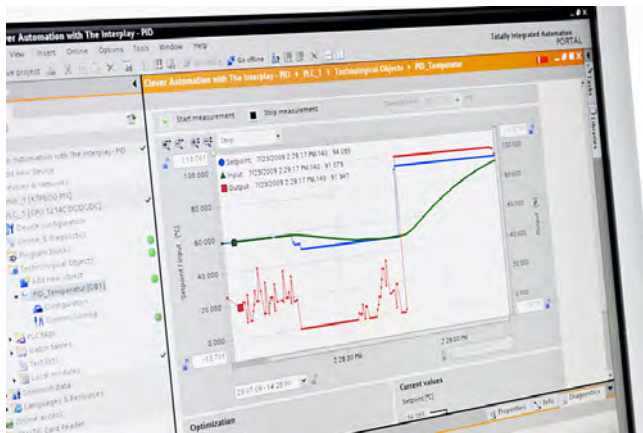
# Software for SIMATIC Controllers

TIA Portal

PLC programming

## STEP 7 (TIA Portal) options > PID Professional (TIA Portal)

### Overview



- PID Professional combines the two option packages Modular PID Control and Standard PID Control in TIA Portal.
- Permits the simple integration of continuous PID controllers, pulse controllers and step controllers in the application program
- Can be used for simple to complex closed-loop control tasks in SIMATIC S7-300 (CPU 313 or higher), S7-400, and WinAC.
- The engineering software for PID Professional is already included in the STEP 7 package in V13 or higher.
- Tuning functionality by means of PID Self-Tuner (part of STEP 7 as of V11 SP1).
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller

### Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The engineering software requires STEP 7 Professional. The software is part of the STEP 7 Professional DVD and/or the program download. A license key is required for activation.
- During runtime, each CPU requires its own runtime license.
- Upgrades to PID Professional (engineering license or single runtime license) are offered for Standard PID Control/Modular PID Control from V11 onwards.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

### Ordering data

### Article No.

#### PID Professional for TIA Portal

##### Task:

Function blocks and editors for PID controllers

##### Requirement:

STEP 7 V13 or higher

##### Delivery package:

Licenses on USB flash drive/downloadable

Floating license for the engineering and single license for runtime

**6ES7860-1XA02-0XA5**

Single license (Certificate of License) for runtime; per CPU (all versions)

**6ES7860-1XA01-0XB0**

Floating license for the engineering; download (email address required for delivery)<sup>1)</sup>

**6ES7860-1XA01-0XH5**

Upgrade from Standard PID Control or Modular PID Control V5.1 to PID Professional for TIA Portal; floating license for the engineering; download (email address required for delivery)<sup>1)</sup>

**6ES7860-1XA01-0XK5**

Upgrade from Standard PID Control or Modular PID Control V5.1 to PID Professional for TIA Portal; single license for runtime

**6ES7860-1XA02-0XE5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**Overview**

- Low-priced package for simple, controlled positioning and simple geared synchronous motion
- For use with any standard variable-speed drive, such as frequency converter or servo drive
- For incremental and absolute encoders

**Licensing**

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The Engineering Software requires STEP 7 Professional, the software is part of the STEP 7 Professional DVD and/or the program download. A license key is required for activation.
- During runtime, each CPU requires its own runtime license.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

**Ordering data****Article No.****Easy Motion Control for TIA Portal**

Requirement: STEP 7 from V12 SP1; software included in STEP 7 V13

Floating license and single license (Runtime)

**6ES7864-2XA02-0XA5**

Type of delivery: CoL for the configuration software, USB flash drive with a license key for the configuration software, CoL for a runtime license; without software or documentation

Floating license download by email, valid for V11 or higher (email address required for delivery<sup>1)</sup>); without software or documentation

**6ES7864-2XA01-0XH5**

**Easy Motion Control Runtime License**

Type of delivery: CoL for one runtime single license (valid for Easy Motion Control V2.x and V11 or higher), without software or documentation

**6ES7864-0AF01-0YX0**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**Technical specifications****Supported hardware:**

Easy Motion Control is runnable on the following CPUs:

- S7-300.
- S7-400.
- WinAC.
- ET 200S.
- ET 200pro.

Supported modules for the measuring of actual values:

- CPU 314C (FW version 2.0 of the CPU or higher).
- ET 200S 1 Count 5V/500 kHz.
- ET 200S 1 Count 24V/100kHz.
- ET 200S 1SSI.
- SM 338.
- FM 350-1, FM 450-1.
- SIMODRIVE Sensor with PROFIBUS DP.
- IM 174.
- Other modules for measuring actual values (using free driver).

Supported modules for setpoint output:

- ET 200S 2AO U.
- SM 332.
- SM 432.
- IM 174.
- Other modules for setpoint output (using free driver).

Supported drives using PROFIBUS DP:

- Micromaster 4.
- SINAMICS G120.
- SINAMICS S120.

**Storage space requirements**

Required work memory in bytes		
Block	Required work memory per block	Additional work memory required per instance
MC_Init	1086	-
MC_MoveAbsolute	3924	112
MC_MoveRelative	2982	110
MC_MoveJog	3110	110
MC_Home	2886	104
MC_StopMotion	1114	70
MC_Control	1756	58
MC_Simulation	410	64
MC_GearIn	3476	128
Input driver	1416 ... 2654	76 ... 128
Output driver	384 ... 1242	52 ... 68
Axis data block	-	294

## Software for SIMATIC Controllers

TIA Portal

PLC programming

### STEP 7 (TIA Portal) options > OPC UA S7-1200/S7-1500

#### Overview

The vendor- and platform-independent OPC Unified Architecture (UA) is the communication standard for Industry 4.0 and is the standard mechanism for accessing SIMATIC S7-1500 and S7-1200 data from non-Siemens devices.

#### New with V17 and S7-1200 (firmware V4.5)

- OPC UA Server on S7-1200 CPUs with following functionality:
  - Methods for consistent data transfer
  - Structured data types and arrays
  - Additional diagnostic buffer entries for OPC UA Server and OPC UA diagnostics in the TIA Portal

#### New with V17 and S7-1500 (firmware V2.9)

- PC UA Server:
  - Alarms & Conditions on Standard SIMATIC Interface
- Global Discovery Service (GDS) support for certificate management
- Supports further PLC data types for mapping to OPC UA:
  - Localized Text and Byte strings
- Automatic creation of OPC UA instances in the server interface for data types of an OPC UA reference namespace to an FB or UDT
- Improvement of modeling for server interface or companion specifications
- OPC UA Client:
  - New blocks for easy handling

#### Licensing

An OPC UA Server or OPC UA Client is available on the target systems (CPUs) and is activated using runtime licenses.

Runtime licenses are offered in three levels for different target systems:

Target system	OPC UA S7-1200 Basic	OPC UA S7-1500 Small	OPC UA S7-1500 Medium	OPC UA S7-1500 Large
S7-1200 CPUs	Yes	No	No	No
ET 200SP CPU 1510SP/1512SP/1515SP (Open Controller)	No	Yes	Yes	Yes
S7-1500 CPU 1511/1513 CPU 1504D Drive Controller				
ET 200pro CPU 1516pro S7-1500 CPU 1515/1516 Software Controller 1507S	No	No	Yes	Yes
S7-1500 CPU 1517/1518/1508S CPU 1507D Drive Controller	No	No	No	Yes

The runtime license includes the certificate for OPC UA (Server and Client) and can be run on the respective target systems including F, C and T/TF as from firmware V2.0 (Client V2.6).

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### SIMATIC OPC UA S7-1200 Basic

Single runtime license; can run on all S7-1200 CPUs (incl. F) from firmware V4.4

License certificate for OPC UA server (data access)

**6ES7823-0BA00-2BA0**

Download incl. license certificate for OPC UA server (data access) <sup>1)</sup>

**6ES7823-0BE00-2BA0**

Email address required for delivery

##### SIMATIC OPC UA S7-1500 Small

Single runtime license; can run on ET 200SP CPU 1510SP/1512SP/1515SP (Open Controller), S7-1500 CPU 1511/1513, CPU 1504D Drive Controller

License certificate for OPC UA server (data access and OPC UA client)

**6ES7823-0BA00-1BA0**

Download incl. license certificate for OPC UA server (data access and OPC UA client) <sup>1)</sup>

**6ES7823-0BE00-1BA0**

Email address required for delivery

##### SIMATIC OPC UA S7-1500 Medium

Single runtime license; can run on ET 200pro CPU 1516pro, ET 200SP CPU 1510SP/1512SP/1515SP (Open Controller), S7-1500 CPU 1511/1513/1515/1516, Software Controller 1507S, CPU 1504D Drive Controller

License certificate for OPC UA server (data access and OPC UA client)

**6ES7823-0BA00-1CA0**

Download incl. license certificate for OPC UA server (data access and OPC UA client) <sup>1)</sup>

**6ES7823-0BE00-1CA0**

Email address required for delivery

##### SIMATIC OPC UA S7-1500 Large

Single runtime license; can run on ET 200pro CPU 1516pro, ET 200SP CPU 1510SP/1512SP/1515SP (Open Controller), S7-1500 CPU 1511/1513/1515/1516/1517/1518, Software Controller 1507S, 1508S, CPU 1504D, CPU 1507D Drive Controller

License certificate for OPC UA server (data access and OPC UA client)

**6ES7823-0BA00-1DA0**

Download incl. license certificate for OPC UA server (data access and OPC UA client) <sup>1)</sup>

**6ES7823-0BE00-1DA0**

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

#### Technical specifications

##### Can be used for

SIMATIC OPC UA S7-1200	For all S7-1200 CPUs from firmware V4.4
SIMATIC OPC UA S7-1500	For all S7-1500 CPUs and ET 200SP CPUs with firmware V2.0 or higher (incl. S/F/T versions) and PLCSIM Advanced



## Overview

TIA Portal Multiuser Engineering allows several users to work on the same project simultaneously. This results in a significant reduction in configuration times, and projects can be commissioned faster.

The basic principle:

The project administration is handled by an autonomous server application. This can be installed independent of a TIA Portal.

### New with V17

- Multiuser sessions can be stored on network drives and local sessions can also be saved as TIA Portal archive (single project).
- All user IDs are now saved during check-in.
- Export/import of projects is possible directly from the administration tool.
- Openness functions can be used in a Multiuser session. This allows the use of existing Openness applications within Multiuser Engineering.
- TIA Portal V17 provides new Multiuser Openness APIs for integrating Multiuser workflows into dedicated automation workflows.
- Combining Openness functions and the new Multiuser Openness APIs enables efficient, automated Multiuser operations via own applications or in TIA Portal add-ins.
- With V17, the asynchronous commissioning mode supports the loading of PLCs with activated access protection and of program changes to the F-program component.

### Licensing

- The software can be installed on multiple computers. The number of licenses acquired determines the number of computers on which the software can be used simultaneously (floating license).
- The software is part of the STEP 7/WinCC (TIA Portal) DVD and/or of the program download; a license key is required for activation.
- An upgrade to version V17 is available for users of the previous V14...V16 versions.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

## Ordering data

## Article No.

### TIA Portal Multiuser Engineering V17

Software is a component of STEP 7 / WinCC as of V17. Only the Certificates of License (CoL) are delivered with the license.

Data storage medium package, floating license, license key on USB flash drive

**6ES7823-1AA07-0YA5**

Download incl. license key, floating license; license key for download <sup>1)</sup>

**6ES7823-1AE07-0YA5**

Email address required for delivery

### Upgrade

Software is a component of STEP 7 / WinCC as of V17. Only the Certificates of License (CoL) are delivered with the license.

Upgrade TIA Portal Multiuser Engineering V14...V16 to V17, floating license; license key on USB flash drive

**6ES7823-1AA07-0YE5**

Upgrade TIA Portal Multiuser Engineering V14...V16 to V17, floating license; license key for download <sup>1)</sup>

**6ES7823-1AE07-0YE5**

Email address required for delivery

### Software Update Service <sup>2)</sup>

Data storage medium package

**6ES7823-1AA00-0YL5**

Download <sup>1)</sup>

**6ES7823-1AE00-0YL5**

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

<sup>2)</sup> For more information on the Software Update Service, see page 12/2.

## Software for SIMATIC Controllers

TIA Portal

TIA Portal options

### TIA Portal Test Suite

#### Overview

- Software to support quality assurance of automation programs in the TIA Portal
- Contains tools for checking the programming style and for creating test routines for software modules:
  - Styleguide Checker:
    - to ensure a unified programming style, rule sets with programming guidelines in the TIA Portal project can be defined as well as their compliance regularly checked.
  - Application test:
    - to check the correct processing of individual logic blocks or entire S7-1500 applications, test routines with function tests can be created in a TIA Portal project and subsequently executed and validated with help of SIMATIC S7-PLCSIM Advanced V3.0.

#### New with V17

- For inclusion in continuous integration workflows, the following functions can be run via an Openness API:
  - XML/ASCII file export and import for rule sets and test cases
  - Export and import from libraries (copy templates)
  - Running of styleguide checker and application test
  - Test results are provided as .NET objects in the Openness application and can thus be exported with a user-defined export format.
- Application test now also supports ET 200pro, S7-1500 R/H and SIMATIC Drive Controller (requires SIMATIC S7-PLCSIM Advanced V4.0 installation)
- New instruction "Assert.InRange (variable, lowerBound, upperBound)" for integer and real tags

#### Licensing

- The software can be installed on multiple computers. The number of licenses acquired determines the number of computers on which the software can be used simultaneously (floating license).
- The application tests created with the Test Suite can only be executed in conjunction with SIMATIC S7-PLCSIM Advanced V3.0 including Update 1 or higher. An additional SIMATIC S7-PLCSIM Advanced V3.0 license is, however, not necessary for this.
- There is also the option of completing a Software Update Service.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### TIA Portal Test Suite Advanced V17

Software to support quality assurance of automation programs in the TIA Portal; Software can exclusively be used together with STEP 7 Prof. / WinCC as of V17. To execute application tests, the SIMATIC S7-PLCSIM Advanced V3.0 software including Update 1 must also be installed.

Floating license, software, documentation and license key for download <sup>1)</sup>

Email address required for delivery

**6ES7823-1TE07-0AA5**

##### Upgrade

Upgrade TIA Portal Test Suite Advanced V16 to V17, floating license, software, documentation and license key for download <sup>1)</sup>

Email address required for delivery

**6ES7823-1TE07-0AE5**

##### Software Update Service <sup>2)</sup>

Download incl. license key <sup>1)</sup>

Email address required for delivery

**6ES7823-1TE00-0AL5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>.

<sup>2)</sup> For more information on the Software Update Service, see page 12/2.

**Overview**

The TIA Portal Cloud Connector enables access to local PG/PC interfaces and connected SIMATIC hardware from the TIA Portal Engineering while the engineering is taking place via a remote desktop on a server of a private cloud.

**Licensing**

- The "Special Terms for the Use of Software with the TIA Portal Cloud Connector " apply for software for use with separately licensed TIA Portal products that have been released for use with the Cloud Connector:  
<https://support.industry.siemens.com/cs/ww/en/view/109739390>
- The software is part of the STEP 7/WinCC (TIA Portal) DVD and/or the program download.

**Ordering data****TIA Portal Cloud Connector**

Single license;  
software is component of  
STEP 7 / WinCC V14 and higher.  
Only the Certificates of License  
(CoL) are delivered with the license.

- Data storage medium package
- Download including license key <sup>1)</sup>  
Email address required for  
delivery

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

**Article No.**

**6ES7823-1CA00-0YA0**  
**6ES7823-1CE00-0YA0**

## Software for SIMATIC Controllers

TIA Portal

TIA Portal options

### TIA Portal Teamcenter Gateway

#### Overview

The Teamcenter Gateway permits storage and management of TIA Portal projects and global libraries in Teamcenter. Program handling is integrated into the TIA Portal.

#### Licensing

- Please note the compatibility of the installed program versions for the operation of the Teamcenter Gateway.
- The software can be installed on multiple computers. The number of licenses acquired determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to version V17 is available for users of the previous V14...V16 versions.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### TIA Portal Teamcenter Gateway

Data storage medium package, floating license, license key on USB flash drive

**6ES7823-1EA07-0YA5**

Download incl. license certificate and license key for TIA Portal Teamcenter Gateway V17, floating license<sup>1)</sup>

**6ES7823-1EE07-0YA5**

Email address required for delivery

##### Upgrade

Upgrade TIA Portal Teamcenter Gateway V14...V16 to V17, floating license

**6ES7823-1EA07-0YE5**

Upgrade TIA Portal Teamcenter Gateway V14...V16 to V17, floating license; license key for download<sup>1)</sup>;

**6ES7823-1EE07-0YE5**

Email address required for delivery

##### Software Update Service<sup>2)</sup>

For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version

Data storage medium package

**6ES7823-1EA00-0YL5**

Download<sup>1)</sup>

**6ES7823-1EE00-0YL5**

Email address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

<sup>2)</sup> For more information on the Software Update Service, see page 12/2.

#### Technical specifications

Can be used with:

- TIA Portal V17
- Teamcenter V11, V12 and V13

**Overview****SIMATIC Visualization Architect**Challenge:

- To standardize the user interfaces of the visualizations throughout the plant
- Significant reduction of the engineering costs for generating the visualizations
- To make the in-house work standard usable

Solution:

- Automatic generation and creation of the visualizations, based on the program code of the PLC and corresponding visualization objects within the framework of system-wide library concepts.

**Licensing**

- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to the subsequent version is offered for users of previous versions.
- A rental license is available for temporary use
- A trial license is available for testing purposes
- It is possible to conclude Software Update Service (SUS) contracts

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

**Ordering data****Article No.****SIMATIC Visualization Architect V17**As package

- SIMATIC Visualization Architect V17
- SIMATIC Visualization Architect V17 Rental
- SIMATIC Visualization Architect V17 Trial  
Download in Customer Support Portal

**6AV2107-0PX07-0AA5****6AV2107-0PX07-0AA6****6AV2107-0PX07-0AA7**As download <sup>1)</sup>

- SIMATIC Visualization Architect V17
- SIMATIC Visualization Architect V17 Rental

**6AV2107-0PX07-0AH5****6AV2107-0PX07-0AH6****Upgrade SIMATIC Visualization Architect**

Engineering software in the TIA Portal;  
software and documentation on CD,  
License key on USB flash drive  
Class A;  
6 languages: en, de, fr, es, it, zh

**V16 -> V17**

- As package
- As download <sup>1)</sup>  
Email address required for delivery

**6AV2107-3PX07-0AA5****6AV2107-3PX07-0AH5****V15/V15.1 -> V16**

- As package
- As download <sup>1)</sup>  
Email address required for delivery

**6AV2107-3PX06-0AA5****6AV2107-3PX06-0AH5**

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

**Technical specifications****SIMATIC Visualization Architect**

Operating system requirements	In accordance with the requirements of the TIA Portal components: <ul style="list-style-type: none"> <li>• SIMATIC STEP 7 (TIA Portal)</li> <li>• SIMATIC WinCC Unified, Professional, Advanced, Comfort, Basic</li> </ul>
Supported STEP 7 version	SIMATIC STEP 7 V17
Supported WinCC versions	SIMATIC WinCC V17 Unified, Professional, Advanced, Comfort, Basic

## Software for SIMATIC Controllers

TIA Portal

TIA Portal options

### SIMATIC ProDiag

#### Overview

The TIA Portal option ProDiag makes it possible to monitor a machine or plant and to intervene in the event of a fault. The monitoring messages which can be generated for the various faults provide specific information on the monitoring mode, location and cause of the fault. Information on troubleshooting can be provided in addition. Plant operators can then not only recognize faults, they can also identify any potential danger in advance and take appropriate countermeasures.

#### Licensing

- The runtime license for controllers includes 250 supervisions or an unlimited number of supervisions per CPU. From FW 2.0 onwards, the software can run on S7-1500/ET 200SP CPUs regardless of the TIA Portal version.
- For the visualization of the messages, the controls are licensed according to the HMI runtime platforms.

You can find more information on the Software Update Service, license types, online software delivery and handling your software licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### SIMATIC ProDiag S7-1500 for 250 monitoring functions

For SIMATIC S7-1500 CPUs and ET 200SP CPUs with FW 2.0 and higher. Independent of the TIA Portal version.

Package with data storage medium

**6ES7823-0AA00-1AA0**

Download incl. license key <sup>1)</sup>

**6ES7823-0AE00-1AA0**

E-mail address required for delivery

##### SIMATIC ProDiag S7-1500 for all planned monitoring tasks on a CPU

For SIMATIC S7-1500 CPUs and ET 200SP CPUs with FW 2.0 and higher. Independent of the TIA Portal version.

Package with data storage medium

**6ES7823-0AA00-1DA0**

Download incl. license key <sup>1)</sup>

**6ES7823-0AE00-1DA0**

E-mail address required for delivery

##### SIMATIC ProDiag for SIMATIC Comfort / Mobile Panels

Controls for SIMATIC WinCC as of V14.

Package with data storage medium

**6AV2107-0UP00-0BB0**

Download incl. license key <sup>1)</sup>

**6AV2107-0UP00-0BH0**

E-mail address required for delivery

##### SIMATIC ProDiag for WinCC Runtime Advanced

Controls for SIMATIC WinCC as of V14.

Package with data storage medium

**6AV2107-0UA00-0BB0**

Download incl. license key <sup>1)</sup>

**6AV2107-0UA00-0BH0**

E-mail address required for delivery

##### SIMATIC ProDiag for WinCC Runtime Professional

Controls for SIMATIC WinCC as of V14

Package with data storage medium

**6AV2107-0UB00-0BB0**

Download incl. license key <sup>1)</sup>

**6AV2107-0UB00-0BH0**

E-mail address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

#### Technical specifications

##### Can be used for

SIMATIC ProDiag S7-1500

For all S7-1500 CPUs and ET 200SP CPUs with FW V2.0 and higher

## Overview

The SIMATIC Modular Application Creator enables the automated generation of TIA Portal projects based on pre-defined software modules. Especially with complex machine configurations, such as a multi-belt control, a printing machine or other applications with many axes, this is very efficient compared to manually creating and parameterizing the associated automation project directly in the TIA Portal.

The software modules provide a technological view of the application and can be used in the TIA Portal without programming knowledge. They are stored in a separate repository, independent of the tool, which needs to be connected to the tool.

### Licensing

- The SIMATIC Modular Application Creator and the existing modules are available as a free download via the Siemens Industry Online Support.
- A corresponding license is required for each CPU into which a module is generated.

## Ordering data

## Article No.

### SIMATIC Modular Application Creator

For automated generation of TIA Portal projects with use of pre-configured software modules

For download at  
<https://support.industry.siemens.com/cs/ww/en/view/109762852>

### SIMATIC Modular Application Creator Equipment Module

Pre-configured software modules for use with the SIMATIC Modular Application Creator

For download at  
<https://support.industry.siemens.com/cs/ww/en/view/109762849>

### SIMATIC Modular Application Creator licenses

For the generation of executable TIA Portal projects with integrated Modular Application Creator software modules; a license must be purchased for each CPU on which the project is to run:

For standard modules without use of technological objects (e.g. OMAC or Weihenstephan)

- Single Basic License, Certificate of License
- Single Basic License, Certificate of License for download<sup>1)</sup>  
Email address required for delivery

**6ES7823-0MA00-1BA0**

**6ES7823-0ME00-1BA0**

For modules with use of technological objects (e.g. Intelligent Belt)

- Single Advanced License, Certificate of License
- Single Advanced License, Certificate of License for download<sup>1)</sup>  
Email address required for delivery

**6ES7823-0MA00-1DA0**

**6ES7823-0ME00-1DA0**

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## Technical specifications

The SIMATIC Modular Application Creator can be used for:

- TIA Portal and StartDrive as of V16.0, with activated Openness interface and
- All SIMATIC S7-1500 CPUs as of FW version 4.8.

## Software for SIMATIC Controllers

TIA Portal

TIA Portal options

### Central user management (UMC)

#### Overview

The User Management Component (UMC) provides the possibility of central user management. Through the connection to the TIA Portal, users and user groups can be defined and managed across projects. Connection to a Microsoft Active Directory is also possible.

#### Licensing

- Central user management (UMC) is supplied with the TIA Portal.
- The license model depends on the number of user accounts per UMC domain.
- Up to ten user accounts can be used without a license.
- For additional user accounts, 365-day rental licenses are available to accumulate the required number of centrally managed users.

#### Ordering data

##### Central user management (UMC)

Software component to implement central user management, included in the scope of supply of the respective products (e.g. TIA Portal).

The license model depends on the number of user accounts per UMC domain. Use of max. 10 user accounts possible without a license.

6 languages: en, de, fr, es, it, zh; executable under Windows 7 (64-bit), Windows 10 (64-bit), Windows Server 2012R2 (64-bit), Windows Server 2016/2019 (64-bit)

- Rental license 365 days with license certificate for 100 user accounts
- Rental license 365 days with license certificate for 4 000 user accounts

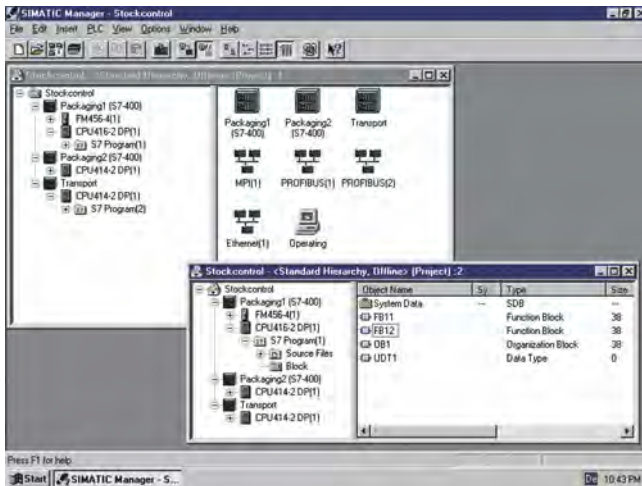
#### Article No.

**6ES7823-1UE30-0YA0**

**6ES7823-1UE10-0YA0**



## Overview



- Basic software STEP 7:  
The standard tool for the SIMATIC S7, SIMATIC C7 and SIMATIC WinAC automation systems.
- For fully utilizing the performance capability of the systems.
- With user-friendly functions for all phases of an automation project:
  - Configuration and parameter assignment of the hardware
  - Specifying the communication
  - Programming
  - Testing, commissioning and service
  - Documentation, archiving
  - Operating, diagnostic functions

## Note

The STEP 7 (TIA Portal) engineering software is required to program the new generation of S7-1200, S7-1500 and ET 200SP CPU PLCs as well as the S7-1500 Software Controller; it can also be used for programming the S7-300, S7-400 and SIMATIC WinAC.

Siemens offers a combo license for both platforms which enables you to work using both STEP 7 (TIA Portal) as well as traditional engineering software. See "STEP 7 Professional" for more information.

## Licensing

- STEP 7 V5.7 can be installed on multiple computers.  
The number of licenses acquired determines the number of computers on which the software can be used simultaneously (floating license).
- A 50 h rental license is available for limited use.
- An upgrade to version V5.7 is offered for users of the previous V5.3...5.6 versions.
- A 5.6 license is also valid for the version V5.7.
- A trial license is available for testing purposes.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

## Ordering data

## Article No.

## STEP 7 Version 5.7

Target system:  
SIMATIC S7-300/400, SIMATIC C7

Requirement:  
Windows 10 Professional/  
Enterprise, Windows Server 2016,  
Windows Server 2019

Type of delivery:  
German, English, French, Spanish,  
Italian; incl. license key on USB  
flash drive, with electronic  
documentation

Floating license on DVD

**6ES7810-4CC12-0YA5**

Floating license, download<sup>1)</sup>;  
Software, license key and  
documentation as download;  
Consignee email address required  
for delivery

**6ES7810-4CE12-0YB5**

Rental license for 50 hours;

**6ES7810-4CC12-0YA6**

Software and documentation on  
DVD, license key on USB flash drive

Rental license for 50 hours,  
download<sup>1)</sup>;

**6ES7810-4CE12-0YB6**

Software, license key and  
documentation as download;  
Consignee email address required  
for delivery

Upgrade floating license  
V5.3...5.6 to V5.7; on DVD

**6ES7810-4CC12-0YE5**

Upgrade floating license  
V5.3...V5.6 to V5.7, download<sup>1)</sup>;  
Software, license key and  
documentation as download;  
Consignee email address required  
for delivery

**6ES7810-4CE12-0YE5**

STEP 7 V5.7 Trial License;  
On DVD, operational for 21 days

**6ES7810-4CC12-0YA7**

## STEP 7 Version 5.7 Japanese

Target system:  
SIMATIC S7-300/400, SIMATIC C7,  
SIMATIC WinAC

Requirement:  
Windows 10 Professional/  
Enterprise, Windows Server 2016,  
Windows Server 2019

Type of delivery:  
English, Japanese; incl. license key  
on USB flash drive, with electronic  
documentation

Floating license Japanese on DVD

**6ES7810-4CC12-0JA5**

Upgrade floating license Japanese  
V5.3...V5.6 to V5.7; on DVD

**6ES7810-4CC12-0JE5**

## STEP 7 Version 5.7 Chinese

Target system:  
SIMATIC S7-300/400, SIMATIC C7

Requirement:  
Windows 10 Professional/  
Enterprise, Windows Server 2016,  
Windows Server 2019

Type of delivery:  
English, Chinese; incl. license key  
on USB flash drive, with electronic  
documentation

Floating license Chinese on DVD

**6ES7810-4CC12-0KA5**

Upgrade floating license Chinese  
V5.3...V5.6 to V5.7; on DVD

**6ES7810-4CC12-0KE5**

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# Software for SIMATIC Controllers

STEP 7 V5.x

Basic software and editors

## STEP 7

Ordering data	Article No.	Ordering data	Article No.
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	6ES7998-8XC01-8YE0	<b>Components for connecting a PC to MPI and PROFIBUS</b> <i>For PCs with a free PCI slot:</i> <b>CP 5612</b>	6GK1561-2AA00
<b>SIMATIC Manual Collection update service for 1 year</b> Current Manual Collection DVD and the three subsequent updates	6ES7998-8XC01-8YE2	<i>For PCs without a free PCI slot:</i> <b>USB A2 PC adapter</b> For connecting a programming device/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	6GK1571-0BA00-0AA0
<b>EPROM programming device, USB Prommer</b> For programming SIMATIC Memory Cards and EPROM modules	6ES7792-0AA00-0XA0	<b>Components for connecting the PC to Industrial Ethernet</b> <i>For PCs with a free PCI slot:</i> <b>Layer 2 Ethernet cards</b>	
<b>MPI cable</b> For linking SIMATIC S7 and PG through MPI (5 m)	6ES7901-0BF00-0AA0		

## Technical specifications

Article number	6GK1571-0BA00-0AA0
product type designation	PC adapter USB A2
<b>transfer rate</b>	
transfer rate	
<ul style="list-style-type: none"> <li>at the 1st interface acc. to PROFIBUS</li> </ul>	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of electrical connections	
<ul style="list-style-type: none"> <li>at the 1st interface acc. to PROFIBUS</li> </ul>	1
number of interfaces acc. to USB	1
type of electrical connection	
<ul style="list-style-type: none"> <li>at the 1st interface acc. to PROFIBUS</li> </ul>	9-pin Sub-D socket (RS 485)
<ul style="list-style-type: none"> <li>of the USB interface</li> </ul>	Standard-B socket
standard for interfaces USB 2.0	Yes
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
type of voltage supply optional external power supply	No
supply voltage	
<ul style="list-style-type: none"> <li>from USB</li> </ul>	5 V
<ul style="list-style-type: none"> <li>note</li> </ul>	Supply direct from USB
relative symmetrical tolerance at DC	
<ul style="list-style-type: none"> <li>at 5 V</li> </ul>	5 %
consumed current	
<ul style="list-style-type: none"> <li>from USB</li> </ul>	0.2 A
power loss [W]	1 W
<b>ambient conditions</b>	
ambient temperature	
<ul style="list-style-type: none"> <li>during operation</li> </ul>	0 ... 60 °C
<ul style="list-style-type: none"> <li>during storage</li> </ul>	-40 ... +70 °C
<ul style="list-style-type: none"> <li>during transport</li> </ul>	-40 ... +70 °C
relative humidity at 30 °C during operation maximum	95 %
protection class IP	IP20

Article number	6GK1571-0BA00-0AA0
product type designation	PC adapter USB A2
<b>design, dimensions and weights</b>	
module format	USB V2.0 adapter
width	58 mm
height	26 mm
depth	105 mm
net weight	365 g
fastening method 35 mm top hat DIN rail mounting	No
<b>product features, product functions, product components general</b>	
number of plug-in cards of same design plug-in per PC station	1
number of units note	-
<b>product functions diagnostics</b>	
product function	
<ul style="list-style-type: none"> <li>port diagnostics</li> </ul>	Yes
<b>standards, specifications, approvals</b>	
standard	
<ul style="list-style-type: none"> <li>for EMC</li> </ul>	2004/108/EC
<ul style="list-style-type: none"> <li>for safety from CSA and UL</li> </ul>	cULus, UL 60950-1, CSA22.2
<ul style="list-style-type: none"> <li>for emitted interference</li> </ul>	EN 61000-6-3, EN 61000-6-4
<ul style="list-style-type: none"> <li>for interference immunity</li> </ul>	EN 61000-6-1, EN 61000-6-2
certificate of suitability	
<ul style="list-style-type: none"> <li>CE marking</li> </ul>	Yes
<ul style="list-style-type: none"> <li>C-Tick</li> </ul>	Yes

## Overview



STEP 7 Professional supports all IEC languages.

In addition to the languages familiar from STEP 7:

- LAD
- FBD
- STL

the following are also available:

- "Sequential function chart"
- "Structured text"

An offline simulation of user programs created with these languages is included. STEP 7 Professional thus replaces the combination of the individual packages STEP 7, S7-GRAPH, S7-SCL and S7-PLCSIM.

A PowerPack (conversion package) is available for customers who use STEP 7 already and wish to change. A valid STEP 7 license is required for purchasing the PowerPack. A separate update service can be purchased for STEP 7 Professional.

## Note

The STEP 7 (TIA Portal) engineering software is required to program the new generation of S7-1200, S7-1500 and ET 200SP CPU PLCs as well as the S7-1500 Software Controller; it can also be used for programming the S7-300, S7-400 and SIMATIC WinAC.

Siemens offers a combo license for both platforms which enables you to work using both STEP 7 (TIA Portal) as well as traditional engineering software. See "Licensing" for more information.

## Licensing

- New installations of STEP 7 Professional 2021 are only available as combo licenses together with STEP 7 Professional V17 (TIA Portal). The software can be installed on multiple computers. The number of licenses acquired determines the number of computers on which the software can be used simultaneously (floating license). A 50 h rental license is available for limited use.
- An upgrade to V17/2021 Combo is available for users of the previous STEP 7 Professional 2006...2010 versions.
- The license of the version V16/2017 Combo can also be used for STEP 7 V5.7.
- PowerPack and upgrade enable migration from STEP 7 V5.7 to STEP 7 Professional V17/2021 Combo.
- A trial license is available for testing purposes.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

## Ordering data

### Article No.

#### STEP 7 Professional V17/2021

Target system:  
SIMATIC S7-300/-400,  
SIMATIC S7-1200/-1500,  
SIMATIC C7, SIMATIC WinAC  
Requirement:  
Windows Server 2016/2019,  
Windows 10 Professional,  
Windows 10 Enterprise  
Type of delivery:  
English, German, French, Spanish,  
Italian; license key on USB flash  
drive, with electronic  
documentation

**Floating combo license on DVD** 6ES7810-5CC14-0YA5

**Floating license, license key download<sup>2)</sup>** 6ES7810-5CE14-0YB5

Software and documentation as download; Consignee email address required for delivery

**Rental license for 50 hours, license key download<sup>2)</sup>** 6ES7823-1GE07-0YA5

Software and documentation as download; Consignee email address required for delivery

### Article No.

#### Conversion package STEP 7 Professional V17

Only valid if ordered together with Software Update Service 6ES7810-5CC04-0YE2 (STEP 7 Professional and STEP 7 Professional in TIA Portal).

- PowerPack & upgrade from STEP 7 V5.7 to STEP 7 Professional V17/2021 Combo, floating license. STEP 7 Software Update Service is a prerequisite.
- PowerPack & upgrade from STEP 7 V5.7 to STEP 7 Professional V17/2021 Combo, floating license. STEP 7 Software Update Service is a prerequisite. Software download including license key<sup>2)</sup> Consignee email address required for delivery

**6ES7822-1AA07-0XC2**

**6ES7822-1AE07-0XC2**

<sup>2)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# Software for SIMATIC Controllers

STEP 7 V5.x

Basic software and editors

## STEP 7 Professional

Ordering data	Article No.	Ordering data	Article No.
<b>Upgrade from STEP 7 Professional V11...16 to STEP 7 Professional V17 or STEP 7 Professional V11...V16/2017 Combo to V17/2021 Combo or STEP 7 Professional 2006...2010 to V17/2021 Combo, floating license</b>	6ES7822-1AA07-0YE5	<b>Software Update Service (Compact Edition)<sup>1)</sup></b> The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. Delivery items to be combined must be ordered as one item. <ul style="list-style-type: none"> <li>STEP 7 Professional and STEP 7 Professional in the TIA Portal</li> </ul>	6ES7810-5CC00-0YM2
<b>Upgrade from STEP 7 Professional V11...16 to STEP 7 Professional V17 or STEP 7 Professional V11...V16/2017 Combo to V17/2021 Combo or STEP 7 Professional 2006...2010 to V17/2021 Combo, floating license</b> <b>Software download including license key<sup>2)</sup></b> Consignee email address required for delivery	6ES7822-1AE07-0YE5	<b>Software Update Service (download)<sup>1)2)</sup></b> Upgrades and Service Packs are available for downloading. Consignee email address required for delivery <ul style="list-style-type: none"> <li>STEP 7 Professional and STEP 7 Professional in the TIA Portal</li> </ul>	6ES7810-5CC04-0YY2
<b>PowerPack &amp; upgrade from STEP 7 V5.3...V5.7 to STEP 7 Professional V17/2021 Combo, floating license</b>	6ES7822-1AA07-0XC5	<b>EPROM programming device, USB Prommer</b> For programming SIMATIC Memory Cards and EPROM modules	6ES7792-0AA00-0XA0
<b>STEP 7 Professional 2021 Trial License; On DVD, operational for 21 days</b>	6ES7810-5CC13-0YA7	<b>MPI cable</b> For linking SIMATIC S7 and PG through MPI (5 m)	6ES7901-0BF00-0AA0
<b>Software Update Service</b> For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version		<b>Components for connecting a PC to MPI and PROFIBUS</b> <i>For PCs with a free PCI slot:</i> <b>CP 5612</b> <i>For PCs without a free PCI slot:</i> <b>USB A2 PC adapter</b>	6GK1561-2AA00 6GK1571-0BA00-0AA0
<b>Software Update Service (Standard Edition)<sup>1)</sup></b> The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.) <ul style="list-style-type: none"> <li>STEP 7 Professional and STEP 7 Professional in the TIA Portal</li> </ul>	6ES7810-5CC04-0YE2	<b>Components for connecting the PC to Industrial Ethernet</b> <i>For PCs with a free PCI slot:</i> <b>Layer 2 Ethernet cards</b>	

<sup>1)</sup> For more information on the Software Update Service, see page 12/2.

<sup>2)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Technical specifications

Article number	<b>6GK1571-0BA00-0AA0</b>
product type designation	PC adapter USB A2
<b>transfer rate</b>	
transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>interfaces</b>	
number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
number of interfaces acc. to USB	1
type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS 485)
• of the USB interface	Standard-B socket
standard for interfaces USB 2.0	Yes
<b>supply voltage, current consumption, power loss</b>	
type of voltage of the supply voltage	DC
type of voltage supply optional external power supply	No
supply voltage	
• from USB	5 V
• note	Supply direct from USB
relative symmetrical tolerance at DC	
• at 5 V	5 %
consumed current	
• from USB	0.2 A
power loss [W]	1 W
<b>ambient conditions</b>	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity at 30 °C during operation maximum	95 %
protection class IP	IP20

Article number	<b>6GK1571-0BA00-0AA0</b>
product type designation	PC adapter USB A2
<b>design, dimensions and weights</b>	
module format	USB V2.0 adapter
width	58 mm
height	26 mm
depth	105 mm
net weight	365 g
fastening method 35 mm top hat DIN rail mounting	No
<b>product features, product functions, product components general</b>	
number of plug-in cards of same design plug-in per PC station	1
number of units note	-
<b>product functions diagnostics</b>	
product function	
• port diagnostics	Yes
<b>standards, specifications, approvals</b>	
standard	
• for EMC	2004/108/EC
• for safety from CSA and UL	cULus, UL 60950-1, CSA22.2
• for emitted interference	EN 61000-6-3, EN 61000-6-4
• for interference immunity	EN 61000-6-1, EN 61000-6-2
certificate of suitability	
• CE marking	Yes
• C-Tick	Yes

## Software for SIMATIC Controllers

STEP 7 V5.x

Basic software and editors

### S7-SCL

#### Overview

- PASCAL-type high-level language
- Optimized for programming PLCs
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 314 and CPU 312C), S7-400, C7 and WinAC



#### Licensing

- S7-SCL is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product.
- S7-SCL V5.7 is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.7 is available for users of the previous versions as of V5.3.
- A separate update service can be purchased for S7-SCL.
- A trial license valid for 21 days is available for download from Industry Online Support:  
<https://support.industry.siemens.com/cs/ww/en/view/109795037>

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### SIMATIC S7-SCL, Version 5.7

###### Task:

High-level language programming

###### Target system:

SIMATIC S7-300 (CPU 314 or higher), SIMATIC S7-400, SIMATIC C7

###### Requirement:

STEP 7 as of V5.7; Windows 10 Professional/Enterprise, Windows Server 2016, Windows Server 2019

###### Type of delivery:

On CD;

English, German, French, Spanish, Italian; license key on USB flash drive, with electronic documentation

Floating license

**6ES7811-1CC08-0YA5**

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7811-1CA01-0YX2**

Upgrade floating from V5.3 to V5.7

**6ES7811-1CC08-0YE5**

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:

LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current Manual Collection DVD and the three subsequent updates

<sup>1)</sup> For more information on the Software Update Service, see page 12/2.

## Technical specifications

Engineering Tool	S7-SCL
Current version	V5.3
Software class	7
<b>Application areas</b>	
Can be used for	Text-based high-level language programming of simple and complex calculations, CASE, loop, jump, and comparison functions
Marketing message	Programming of algorithms and calculations made easy!
Advantages	<ul style="list-style-type: none"> <li>• Clear and easy-to-read programs</li> <li>• Functional, module-based programming</li> <li>• CASE instruction replaces a large number of jump and comparison functions</li> <li>• Easily understood by PLC programmers, as the programming philosophy of LAD/FBD/STL is retained</li> <li>• Easy switchover to PLC programming for PC programmers</li> <li>• Exchangeability (porting) of subroutines in accordance with IEC 61131-3</li> <li>• Less time required for engineering compared to LAD/FBD/STL: Up to 20% for simple programs; at least 50% for demanding program structures</li> </ul>
Sectors	<ul style="list-style-type: none"> <li>• Labeling machines</li> <li>• Chemical plants (e.g. oxygen extraction, evaluation of measured values)</li> <li>• Rubber and plastics machines</li> <li>• Woodworking machines</li> <li>• Storage and logistics systems</li> <li>• Paper and printing machinery</li> <li>• Punching and cutting machines</li> <li>• Water industry</li> <li>• Coilers</li> </ul>
<b>Target systems</b>	
Can be used in	S7-300 (CPU 313 or higher and CPU 312C or higher recommended) S7-400 C7 (C7-626 or higher recommended) WinAC
<b>System requirements</b>	
Operating system	Windows 10 Windows Server 2016/2019
Required hard drive memory in the programming device/PC approx.	50 MB

Engineering Tool	S7-SCL
<b>Properties</b>	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	Yes
Integration in CFC	Yes
<b>Program runtimes</b>	
with S7-300 (typical)	Similar to LAD/FBD/STL
with S7-400 (typical)	Similar to LAD/FBD/STL
<b>Diagnostics</b>	
Integration of diagnostic data in ProAgent	-
Integration of diagnostic data in ProTool/Pro	-
Integration of diagnostic data in WinCC	-
<b>Supported standards</b>	
IEC 61131-3	PLCopen certification <ul style="list-style-type: none"> <li>• Base level ST available</li> <li>• Reusability Level ST available</li> </ul>
<b>Available versions/licenses</b>	
Floating license	CD-ROM with <ul style="list-style-type: none"> <li>• Tool</li> <li>• Electronic manual</li> <li>• Getting Started guide</li> <li>• Examples</li> </ul> License on USB flash drive Certificate of License Product information
Upgrade (floating license)	CD-ROM with <ul style="list-style-type: none"> <li>• Tool</li> <li>• Electronic manual</li> <li>• Getting Started guide</li> <li>• Examples</li> </ul> License on USB flash drive Certificate of License Product information
Software Update Service (SUS)	
<b>Also a component part of</b>	
STEP 7 Professional	Yes
S7 Trainer Package	Yes
PCS 7	Yes
D7-SYS	-

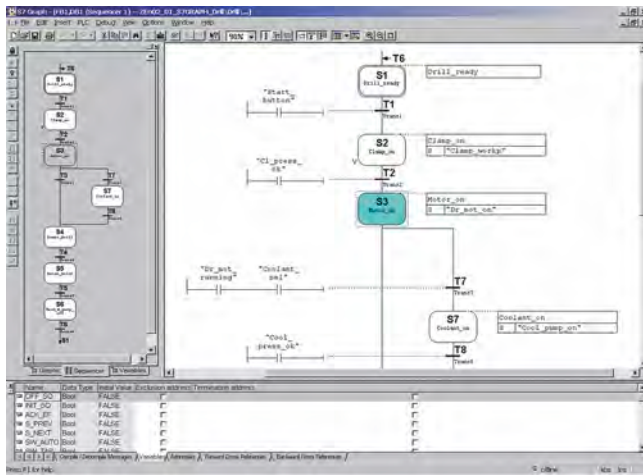
# Software for SIMATIC Controllers

STEP 7 V5.x

Basic software and editors

## S7-GRAPH

### Overview



- For configuring and programming sequential processes using sequencers
- Standardized representation to EN 1131-3
- Clearly comprehensible program thanks to structuring of the process into separate steps
- With extensive diagnostic functions, integrated in the SIMATIC diagnostic concept
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 315 and CPU 312C or higher), S7-400 C7 and WinAC



### Licensing

- S7 GRAPH is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product.
- S7-Graph V5.7 is supplied with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.7 is available for users of previous versions as of V5.3.
- A separate update service can be purchased for S7-GRAPH.
- A trial license valid for 21 days is available for download from Industry Online Support: <https://support.industry.siemens.com/cs/ww/en/view/109795038>

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

### Ordering data

### Article No.

#### SIMATIC S7-GRAPH, Version 5.7

**Task:**  
Configuring and programming of sequences

**Target system:**  
SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7

**Requirement:**  
STEP 7 V5.7; Windows 10 Professional/Enterprise, Windows Server 2016, Windows Server 2019

**Type of delivery:**  
on CD;  
German, English, French, Spanish, Italian; including license key on USB flash drive, with electronic documentation

Floating license **6ES7811-0CC08-0YA5**

Software Update Service (requires current software version)<sup>1)</sup> **6ES7811-0CA01-0YX2**

Upgrade floating license from V5.3 to V5.7 **6ES7811-0CC08-0YE5**

#### SIMATIC Manual Collection **6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI,  
SIMATIC sensors, SIMATIC NET,  
SIMATIC PC-based Automation,  
SIMATIC PCS 7, SIMATIC PG/PC,  
SIMATIC S7, SIMATIC software,  
SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year **6ES7998-8XC01-8YE2**

Current Manual Collection DVD and the three subsequent updates

<sup>1)</sup> For more information on the Software Update Service, see page 12/2.



## Technical specifications

Engineering Tool	S7-GRAPH
Current version	V5.7
Software class	A
<b>Application areas</b>	
Can be used for	Graphical programming of sequential controllers and sequencers
Marketing message	Fast, elegant way to program sequential processes easily and transparently!
Advantages	<ul style="list-style-type: none"> <li>• Can be used to optimum effect even during the design phase</li> <li>• Less configuration effort thanks to graphical structuring and programming</li> <li>• Quick and easy familiarization</li> <li>• Precise fault localization thanks to integrated diagnostics in combination with ProAgent for ProTool/Pro and WinCC</li> <li>• Less time required for engineering compared to LAD/FBD/STL: approx. 40 to 70%</li> </ul>
Sectors	<ul style="list-style-type: none"> <li>• Automotive industry (e.g. body-in-white, final assembly)</li> <li>• Electrical equipment manufacture</li> <li>• Rubber and plastics machines</li> <li>• Pick-and-place machines</li> <li>• Woodworking machines</li> <li>• Metalworking machines</li> <li>• Paper and printing machinery</li> <li>• Testing machines</li> <li>• Rolling mills</li> <li>• Coilers</li> <li>• Leisure and entertainment facilities</li> </ul>
<b>Target systems</b>	
Can be used in	S7-300 (CPU 314 or higher and CPU 312C or higher recommended) S7-400 C7 (C7-626 or higher recommended) WinAC
<b>System requirements</b>	
Operating system	Windows 10 Windows Server 2016/2019
Required hard drive memory in the programming device/PC approx.	50 MB
Required software	STEP 7 V5.7

Engineering Tool	S7-GRAPH
<b>Properties</b>	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	Yes
Integration in CFC	-
<b>Program runtimes</b>	
with S7-300 (typical)	3 ms per block + 1 ms per active step
with S7-400 (typical)	0.4 ms per block + 0.06 ms per active step
<b>Diagnostics</b>	
Integration of diagnostic data in ProAgent	Yes
Integration of diagnostic data in ProTool/Pro	Via ProAgent
Integration of diagnostic data in WinCC	Via ProAgent
<b>Supported standards</b>	
IEC 61131-3	PLCopen certification • Base Level SFC available
Status of PLCopen activities	-
<b>Available versions/licenses</b>	
Floating license	CD-ROM with <ul style="list-style-type: none"> <li>• Tool</li> <li>• Electronic manual</li> <li>• Getting Started guide</li> <li>• Examples</li> </ul> License key on USB flash drive Certificate of License Product information
Upgrade (floating license)	CD-ROM with <ul style="list-style-type: none"> <li>• Tool</li> <li>• Electronic manual</li> <li>• Getting Started guide</li> <li>• Examples</li> </ul> License key on USB flash drive Certificate of License Product information
Software Update Service (SUS)	
<b>Also a component part of</b>	
STEP 7 Professional	Yes
S7 Trainer Package	Yes
PCS 7	-
D7-SYS	-

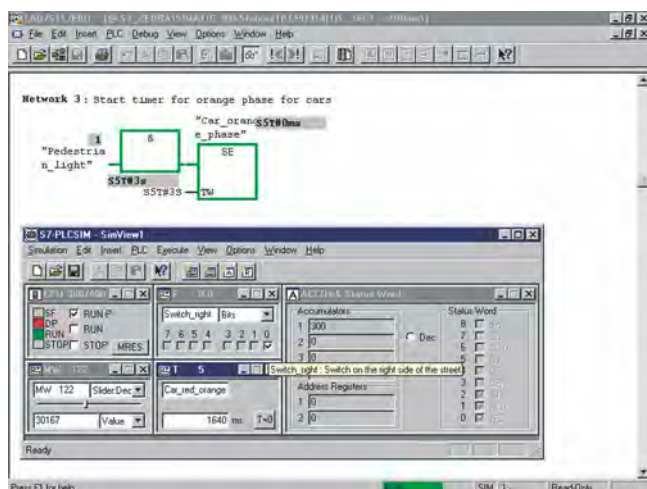
# Software for SIMATIC Controllers

STEP 7 V5.x

Basic software and editors

## S7-PLCSIM

### Overview



- For functional testing of the generated SIMATIC S7 user blocks on a programming device or PC, independent of the availability of the target hardware
- Shifts the detection and correction of programming errors to an early stage of development
- Enables an accelerated and cost-effective initial commissioning and enhances the program quality
- Can be used for LAD, FBD, STL, S7-GRAPH, S7-HiGraph, S7-SCL, CFC, S7-PDIAG, WinCC (local installation)

### Licensing

- S7-PLCSIM is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product
- S7-PLCSIM V5.4 is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.4 is offered for users of the previous versions.
- A separate update service can be purchased for S7-PLCSIM.
- A trial license valid for 14 days is available for download from Industry Online Support:  
<https://support.industry.siemens.com/cs/ww/en/view/109750064>

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

### Ordering data

### Article No.

#### S7-PLCSIM, Version 5.4

**Task:**  
Functional testing of SIMATIC S7 user blocks on programming device/PC

**Target system:**  
SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7

**Requirement:**  
STEP 7 V5.4 or higher incl. SP4/SP5 or STEP 7 > V5.5

**Type of delivery:**  
on CD;  
English, German, French, Spanish, Italian; license key on USB flash drive, with electronic documentation

Floating license

**6ES7841-0CC05-0YA5**

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7841-0CA01-0YX2**

Floating license upgrade to V5.4

**6ES7841-0CC05-0YE5**

#### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:  
LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

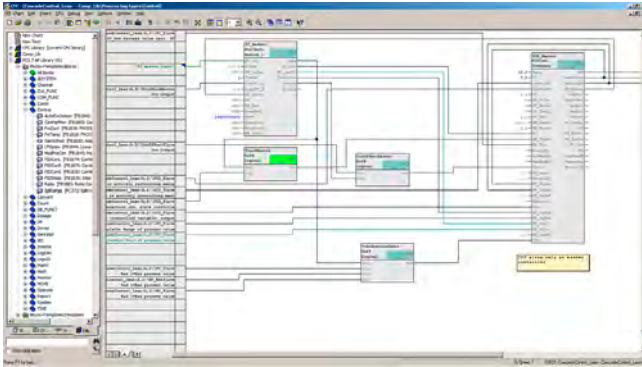
Current Manual Collection DVD and the three subsequent updates

<sup>1)</sup> For more information on the Software Update Service, see page 12/2.

### Technical specifications

Engineering Tool	S7-PLCSIM
Type of license	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows XP Professional Windows 7 Professional Windows 7 Ultimate
Required software packages	STEP 7 V5.4 with SP4 or SP5 or STEP 7 > V5.5
Disk space required in programming device/PC	5 MB

## Overview



- For the generation of automation programs by drawing a technology chart
- With extensive libraries of ready-made software blocks to which user-created blocks can be added
- Minimized outlay and reduced error susceptibility due to the interconnection of ready-made blocks
- Optimized integration in the world of automation, for example, through guaranteed compatibility with all STEP 7 tools
- Can be used for SIMATIC S7-300 (recommended for CPU 316 or CPU 314C or higher), SIMATIC S7-400, SIMATIC WinAC and D7-SYS

### Licensing

- SIMATIC CFC V9.0 is supplied with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 9.0 is available for users of the previous 8.x versions.
- For SIMATIC CFC, the Software Update Service is available with the Standard, Compact and Download types of delivery.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

<http://www.siemens.com/simatic-licenses>

## Ordering data

## Article No.

### SIMATIC CFC, Version 9.0

#### Task:

Graphic configuring and programming of automation applications in the form of technology-oriented diagrams

#### Target system:

SIMATIC S7-300/400,  
SIMATIC WinAC, D7-SYS

#### Requirements:

STEP 7 V5.6 or higher

#### Type of delivery:

Engineering software and electronic documentation on CD-ROM, license key on USB flash drive, Certificate of License

Floating license

**6ES7658-1EX58-0YA5**

Floating License for download.

**6ES7658-1EX58-0YH5**

Email address required for delivery<sup>2)</sup>

Floating license upgrade from V8.x to V9.0

**6ES7658-1EX58-0YE5**

Floating License Upgrade from V8.x to V9.0 for download.

**6ES7658-1EX58-0YK5**

Email address required for delivery<sup>2)</sup>

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7658-1EX00-2YL8**

Software Update Service for multiple orders (requires current software version); the delivery items are combined. For multiple contracts, only 1 package (1 data storage medium set and the corresponding number of licenses) will be supplied. Can be ordered with 5 or more contracts<sup>1)</sup>

**6ES7658-1EX00-2YM8**

Delivery items to be combined must be ordered as one item.

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7658-1EX00-2YV8**

Email address required for delivery

### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI,  
SIMATIC sensors, SIMATIC NET,  
SIMATIC PC-Based Automation,  
SIMATIC PCS 7, SIMATIC PG/PC,  
SIMATIC S7, SIMATIC software,  
SIMATIC TDC

### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current Manual Collection DVD and the three subsequent updates

<sup>1)</sup> For more information on the Software Update Service, see page 12/2.

<sup>2)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

# Software for SIMATIC Controllers

STEP 7 V5.x

Options for programming and design

## CFC

### Technical specifications

EngineeringTool	CFC
Current version	V9.0
Software class	A
<b>Application areas</b>	
Can be used for	Graphical creation, interconnection and parameterization of (preconfigured) blocks and functions
Marketing message	Simply interconnect and configure instead of programming!
Advantages	<ul style="list-style-type: none"> <li>• Can be used to optimum effect even during the design phase</li> <li>• Reduced configuration effort thanks to graphical interconnection</li> <li>• High degree of reusability of diagrams that have already been created</li> <li>• Quick and easy familiarization</li> <li>• Quick and transparent interconnection of ready-made functions</li> <li>• Technological creation of the program as a whole</li> <li>• Clear representation of control loop structures</li> <li>• Short commissioning time</li> <li>• High plant availability</li> <li>• Less time required for engineering compared to LAD/FBD/STL: up to 50%</li> </ul>
Sectors	<ul style="list-style-type: none"> <li>• Automotive industry (e.g. thermostats, tire production processes)</li> <li>• Chemicals</li> <li>• Power engineering and supply</li> <li>• Rubber and plastics machines</li> <li>• Metalworking machines</li> <li>• Food and beverage machines</li> <li>• Petrochemicals</li> <li>• Rolling mills</li> <li>• Water industry</li> <li>• Coilers</li> </ul>
<b>Target systems</b>	
Can be used in	S7-300 S7-400 F/H systems WinAC
<b>System prerequisites</b>	
Operating system	MS Windows 7 Professional with SP1 (64-bit) MS Windows 7 Ultimate with SP1 (64-bit) MS Windows 7 Enterprise with SP1 (64-bit) MS Windows 10 Pro (64-bit) MS Windows 10 Enterprise 2015 LTSB (64-bit) MS Windows Server 2008 R2 Standard Edition with SP1 (64-bit) MS Windows Server 2012 R2 Update Standard Edition (64-bit)
Required hard drive memory in the PG/PC	approx. 80 MB
Required software	STEP 7 V5.6 or higher

EngineeringTool	CFC
<b>Properties</b>	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	-
Integration in CFC	Yes
<b>Program runtimes</b>	
with S7-300 (typical)	Depending on the interconnected blocks
with S7-400 (typical)	Depending on the interconnected blocks
<b>Diagnostics</b>	
Integration of diagnostic data in ProAgent	-
Integration of diagnostic data in ProTool/Pro	-
Integration of diagnostic data in WinCC	-
<b>Supported standards</b>	
IEC 61131-3	based on the IEC standard
Status of PLCopen activities	-
<b>Available versions/licenses</b>	
Floating license	<ul style="list-style-type: none"> <li>• 1 CD</li> <li>• 1 license key memory stick</li> <li>• 1 Certificate of License</li> </ul>
Upgrade (floating license)	<ul style="list-style-type: none"> <li>• 1 CD</li> <li>• 1 license key memory stick</li> <li>• 1 Certificate of License</li> </ul>
Software Update Service (SUS)	
<b>Also a component part of</b>	
STEP 7 Professional	-
S7 Trainer Package	-
PCS 7	Yes
D7-SYS	Yes

#### Overview

- For creating safety-related automation applications with SIMATIC S7 in LAD or FBD (STEP 7 required)
- Implementation of safety functions by simply connecting function blocks
- With prefabricated block library
- Custom block creation possible
- Optimal embedding in the automation world thanks to total integration in the STEP 7 tools
- Scope of supply:
  - Distributed Safety Editor
  - Code generator
  - Debugger
  - Standard block libraries

#### Licensing

- SIMATIC S7 Distributed Safety is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.4 is offered for users of the previous versions 5.x.
- A trial license valid for 14 days is available for download from Industry Online Support:  
<https://support.industry.siemens.com/cs/document/109749360>

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### S7 Distributed Safety V5.4 SP5 update 2 programming tool

###### Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

###### Requirement:

Windows 7 SP1 (64-bit)  
 Windows 10 Professional/Enterprise (64-bit)  
 Windows Server 2008 R2 SP1 (64-bit)  
 Windows Server 2012 R2 (64-bit),  
 Windows Server 2016 (64-bit)  
 STEP 7 from V5.5 SP1

Please also consider the operating systems that have been released for the STEP 7 version used

Floating license for 1 user, software and documentation on DVD, license key on USB flash drive

**6ES7833-1FC02-0YA5**

Floating license for 1 user, software, documentation and license key for download<sup>1)</sup>

**6ES7833-1FC02-0YH5**

Email address required for delivery

##### S7 Distributed Safety upgrade

From V5.x to V5.4;  
 floating license for 1 user, software and documentation on DVD; license key on USB flash drive

**6ES7833-1FC02-0YE5**

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## Software for SIMATIC Controllers

STEP 7 V5.x

Options for programming and design

### Safety Integrated for Process Automation

#### Overview



The process industry frequently features complex technological sequences with high safety demands, and faults and failures in the process automation could have fatal consequences for personnel, machines, plants and the environment. The safety technology used must reliably detect dangerous states in the process and also its own internal errors, and automatically set the plant/application to a safe state.

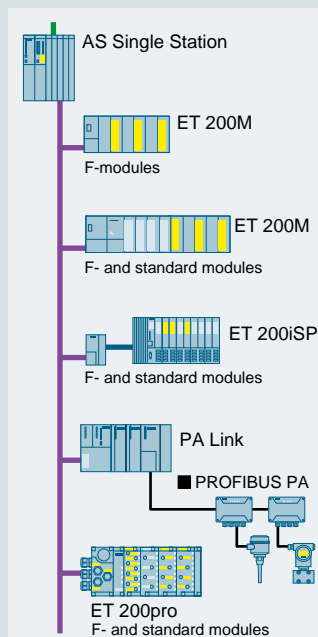
Safety Integrated for Process Automation is the comprehensive range of products and services from Siemens for safe, fault-tolerant applications in the process industry. This is characterized by:

- Safety-oriented F/FH automation systems of the S7-400 series (see "Automation Systems" section)
- Safe communication with the PROFIsafe profile via PROFIBUS (see section "Industrial Communication, PROFIBUS") or PROFINET (see section "Industrial Communication, PROFINET")
- Safe transmitters (SITRANS P DS III) on the PROFIBUS PA with PROFIsafe (see Catalog FI 01, Field devices for process automation)
- ET 200SP HA, ET 200iSP, ET 200M, ET 200S and ET 200pro distributed I/O systems with safety-oriented F-I/O modules/submodules (see "Process I/O" section)
- Safe process instruments/devices for connection to ET 200 distributed I/O systems (see Catalog FI 01, Field Instruments for Process Automation)
- SIMATIC Safety Integrated software for implementation and operation of safety applications, with additional components for the Engineering System and the operator stations: SIMATIC S7 F-systems, SIMATIC S7 Safety Matrix
- Special applications, for example, Partial Stroke Test
- Safety lifecycle management with support by highly qualified solution partners: services for all phases in the lifecycle of a safety instrumented system (analysis, implementation, and operation)

#### Design

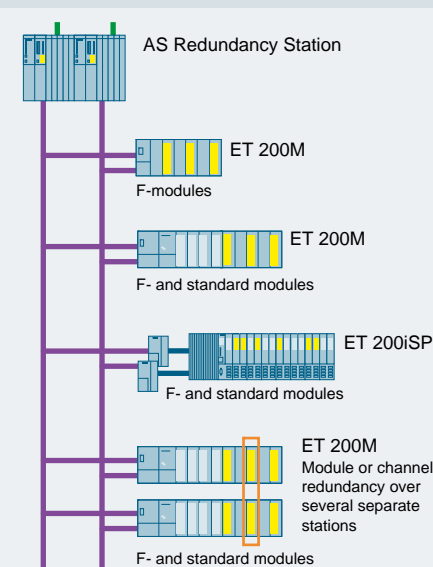
##### Single-channel, non-redundant configuration

Distributed I/O and direct fieldbus interfacing

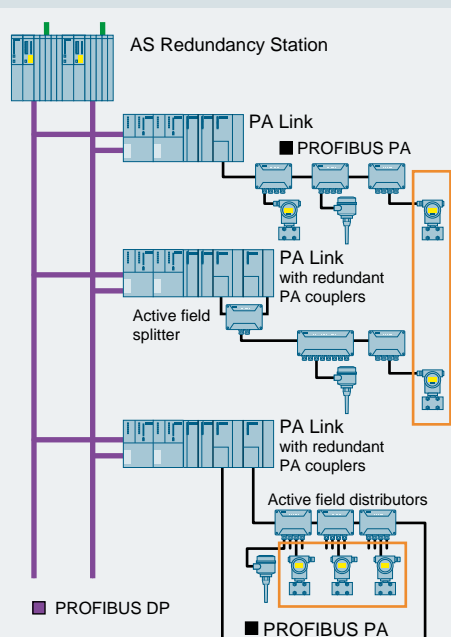


##### Redundant, high-availability and fault-tolerant configuration

Distributed I/O



Direct fieldbus interfacing



Safety-related design versions with PROFIBUS

G\_PCS7\_XX\_00130

## Design

The PROFIsafe profile allows safety-related communication between the automation system (controller) and the process I/O via either PROFIBUS or PROFINET. The decision for choosing either PROFINET IO or the PROFIBUS DP/PA fieldbuses has a significant influence on the architecture of the safety-related system.

### Safety-related design versions with PROFIBUS

In the case of a safety-related system with PROFIBUS communication integrated into SIMATIC PCS 7, a distinction is made across all architecture levels between two design versions:

- Single-channel, non-redundant design
- Redundant, fault-tolerant design

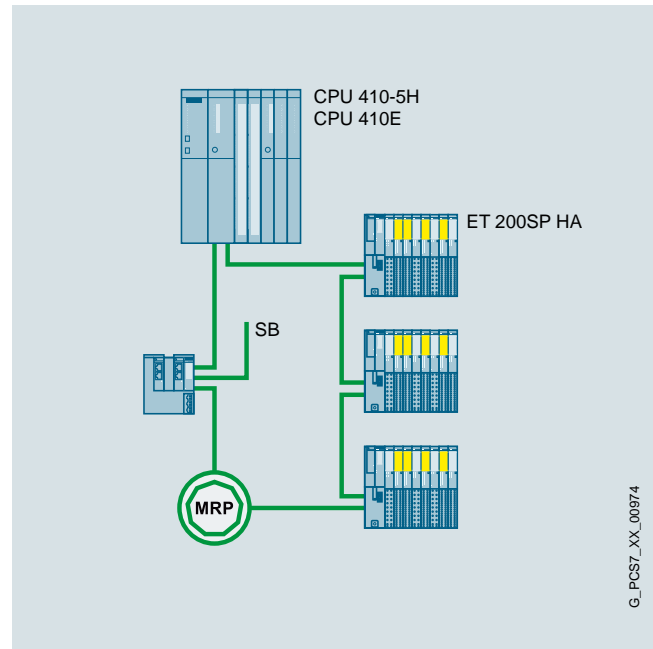
Both design versions are extremely variable, and offer a large scope for different customer requirements. Standard automation (basic process control) and safety-related functions can be combined flexibly, not only in the area of distributed I/O. Even at the controller level, they can be combined in one system or separated. In addition, there are numerous possibilities arising from the use of flexible modular redundancy.

At the individual architectural levels (controller, fieldbus, I/O), you have the configuration alternatives shown in the figure in line with the I/O used (ET 200SP HA, ET 200iSP, ET 200M and ET 200pro remote I/O stations or PROFIBUS PA devices with PA profile 3.0 or higher).

### Safety-related design versions with PROFINET

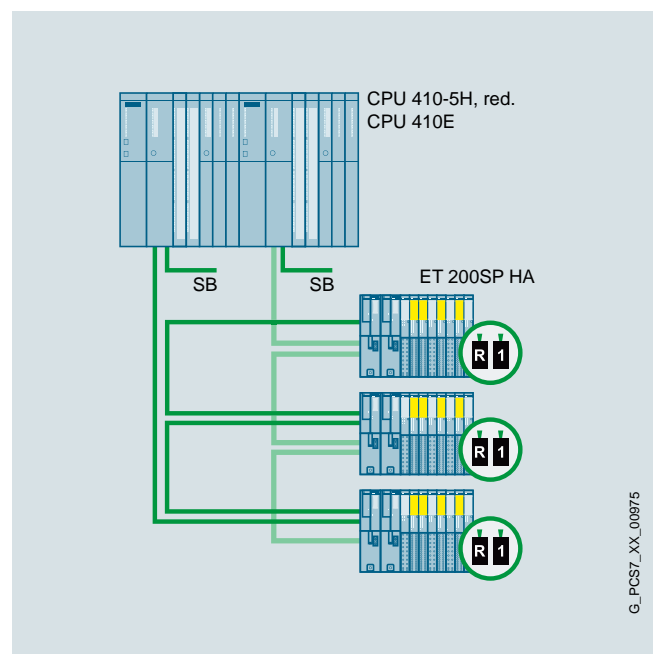
Safety-related AS single stations (F systems) and AS redundancy stations (FH systems) from the S7-400 range can be networked simply and effectively with ET 200M remote I/O stations via PROFINET IO. For this purpose, the PN/IE interface integrated in the CPU and the corresponding PROFINET interface module in the remote I/O stations (e.g. IM 155-6 PN HA for ET 200SP HA) are available on the automation system side.

The availability of the I/O devices on an AS Single Station (F-system) can be increased by a ring topology with media redundancy. If the transmission link in the ring is interrupted at one point, for example, due to a break in the ring cable or the failure of a station, the redundancy manager then immediately activates the alternative communication path.



Safety-related PROFINET IO communication with media redundancy

The maximum availability with minimum error handling times is achieved by the AS Redundancy Station (FH system) in conjunction with the redundant PROFINET configuration R1. From the CPUs of the H system onwards, the R1 devices are connected via two separate line structures. In order to increase availability, we recommend reverse cabling (as shown in the blueprint). In contrast to the single-sided I/O device connection to only one CPU, failure of a CPU in this case does not automatically lead to failure of the connected I/O devices.



Safety-related PROFINET IO communication with system redundancy

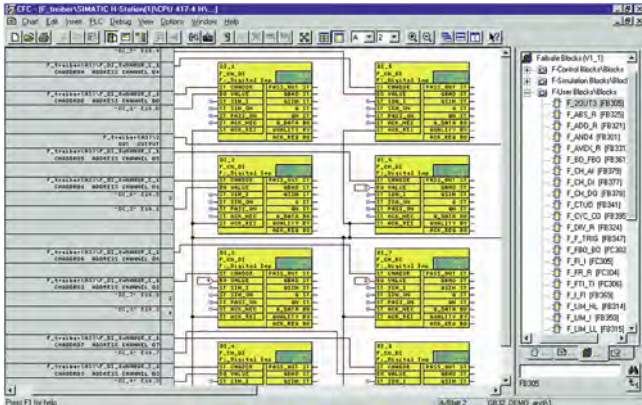
# Software for SIMATIC Controllers

STEP 7 V5.x

Options for programming and design

Safety Integrated for Process Automation > SIMATIC S7 F Systems

## Overview



The SIMATIC S7 F Systems engineering tool for configuration of safety-related SIMATIC PCS 7 automation systems and safety-related F-modules from the ET 200 range is integrated in the SIMATIC Manager. SIMATIC S7 F Systems are based on pre-configured and German Technical Inspectorate certified blocks. The following functions are then available:

- Parameterization of CPU and F signal modules
- Creation of safety-related applications in the CFC

## Information on ordering and delivery

Installation software for the SIMATIC S7 F Systems is provided in the form of a software media package. Software media packages and product-specific software licenses are separate packages. They are not merged into a single delivery unit when supplied in package form.

The number of delivered software media packages can be determined by the number of ordered items. You can find additional information under "Delivery form package" in the "Software Media and Logistics", "PCS 7 Software Packages" section of the ST PCS 7 Catalog.

### Ordering data

### Article No.

### Article No.

#### SIMATIC S7 F Systems

##### SIMATIC S7 F Systems V6.2

Programming and configuration environment for creating and using safety-related STEP 7 programs

2 languages (English, German), software class A

Runs on the following operating systems:

- Windows 10 Enterprise 2015 LTSB 64-bit,
- MS Windows 10 Enterprise 2019 LTSC 64-bit,
- MS Windows Server 2012 R2 Update Standard Edition 64-bit,
- MS Windows Server 2016 Standard Edition 64-bit,
- MS Windows Server 2019 Standard Edition 64-bit

Floating license for 1 user, without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundled with 1 x SIMATIC S7 F Systems Software Media Package per order item
- Online delivery  
License key download and online Certificate of License combined with SIMATIC S7 F Systems Software Media Package (software download and online Certificate of License)  
Note:  
Email address required

6ES7833-1CC36-0YA5

6ES7833-1CC36-0YH5

##### SIMATIC S7 F Systems V6.2

Programming and configuration environment for creating and using safety-related STEP 7 programs  
2 languages (English, German), software class A

Runs on the following operating systems (see SIMATIC S7 F Systems V6.2 Readme for the latest information):

- On the engineering station with Windows 7 SP1 64-bit (Professional, Enterprise, Ultimate) or Windows Server 2008 R2 SP1 Standard 64-bit
- On the operator station also with Windows 7 SP1 32-bit (Enterprise, Ultimate), Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit

Floating license for 1 user, without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundled with 1 x SIMATIC S7 F Systems Software Media Package per order item
- Online delivery  
License key download and online Certificate of License combined with SIMATIC S7 F Systems Software Media Package (software download and online Certificate of License)  
Note:  
Email address required

6ES7833-1CC26-0YA5

6ES7833-1CC26-0YH5

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Ordering data	Article No.	Article No.	
<p><b>SIMATIC S7 F Systems</b> <b>Software Media Package</b></p> <hr/> <p><b>SIMATIC S7 F Systems</b> <b>Software Media Package V6.3</b></p> <p>Installation software without license</p> <p>2 languages (English, German), software class A</p> <p>Runs on the following operating systems:</p> <ul style="list-style-type: none"> <li>Windows 10 Enterprise 2015 LTSC 64-bit, MS Windows 10 Enterprise 2019 LTSC 64-bit, MS Windows Server 2012 R2 Update Standard Edition 64-bit, MS Windows Server 2016 Standard Edition 64-bit, MS Windows Server 2019 Standard Edition 64-bit</li> </ul> <p>Without SIMATIC PCS 7 Software Media Package</p> <p><u>Note:</u> Can only be used in conjunction with a valid license.</p> <ul style="list-style-type: none"> <li>Goods delivery Software on DVD and Certificate of License</li> <li>Online delivery Software download and online Certificate of License</li> </ul> <p><u>Note:</u> Email address required!</p>	<p><b>6ES7833-4CC36-0YT8</b></p> <p><b>6ES7833-4CC36-0YG8</b></p>	<p><b>SIMATIC S7 F Systems</b> <b>Software Media Package V6.2</b></p> <p>Installation software without license</p> <p>2 languages (English, German), software class A</p> <p>Runs on the following operating systems (see SIMATIC S7 F Systems V6.2 Readme for the latest information):</p> <ul style="list-style-type: none"> <li>On the engineering station with Windows 7 SP1 64-bit (Professional, Enterprise, Ultimate) or Windows Server 2008 R2 SP1 Standard 64-bit</li> <li>On the operator station also with Windows 7 SP1 32-bit (Enterprise, Ultimate), Windows 10 Enterprise 2015 LTSC 64-bit or Windows Server 2012 R2 Standard 64-bit</li> </ul> <p>Without SIMATIC PCS 7 Software Media Package</p> <p><u>Note:</u> Can only be used in conjunction with a valid license.</p> <ul style="list-style-type: none"> <li>Goods delivery Software on DVD and Certificate of License</li> <li>Online delivery Software download and online Certificate of License</li> </ul> <p><u>Note:</u> Email address required!</p> <hr/> <p><b>Upgrades for SIMATIC S7 F Systems</b></p> <p>See "Upgrades for Safety Integrated for Process Automation" in section "Update/upgrade packages", "Updates/upgrades asynchronous to the PCS 7 version".</p> <p><u>Note:</u> With a SIMATIC S7 F Systems Upgrade from V5.x to V6.x, the type of SIMATIC S7 F Systems license changes from Single License to Floating License.</p>	<p><b>6ES7833-4CC26-0YT8</b></p> <p><b>6ES7833-4CC26-0YG8</b></p>

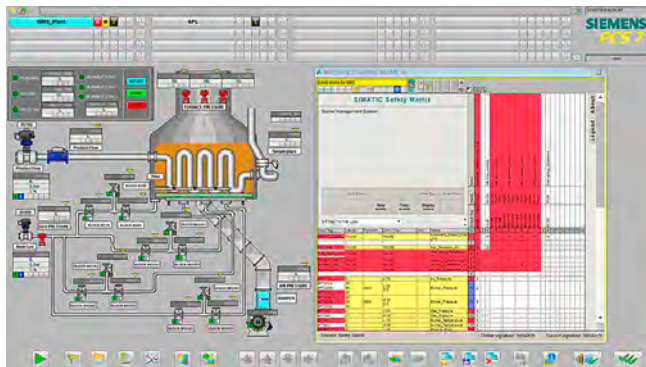
## Software for SIMATIC Controllers

STEP 7 V5.x

Options for programming and design

### Safety Integrated for Process Automation > SIMATIC S7 Safety Matrix

#### Overview



Process image of an operator station with the SIMATIC S7 Safety Matrix Viewer displayed

The SIMATIC S7 Safety Matrix, which can be used in addition to the CFC, is an innovative safety lifecycle tool from Siemens that can be used not only for user-friendly configuration of safety applications, but also for their operation and service. The tool, which is based on the proven principle of a cause & effect matrix, is ideally suited to processes where defined states require specific safety reactions.

The SIMATIC S7 Safety Matrix means that programming of the safety logic is not only significantly simpler and more convenient, but also much faster than conventional processes. During the risk analysis of a plant, the configuration engineer can assign precisely defined reactions (effects) to events (causes) which may occur during a process.

#### Information on ordering and delivery

Installation software for the SIMATIC S7 Safety Matrix is provided in the form of a software media package. Software media packages and product-specific software licenses are separate packages, which are not merged into a single delivery unit for a goods delivery.

The number of delivered software media packages can be determined by the number of ordered items. You can find more information under "Goods delivery" in the section "Software Media and Logistics", subsection "PCS 7 Software Packages" in the ST PCS 7 Catalog.

#### Ordering data

#### Article No.

#### Article No.

##### SIMATIC S7 Safety Matrix

Runs with the following operating systems (see SIMATIC S7 Safety Matrix V6.3 Readme for the latest information):

- On engineering station under:
  - MS Windows 7 SP1 (64-bit) (Ultimate, Enterprise, Professional)
  - MS Windows 10 Enterprise 2015 LTSC
  - MS Windows 10 Enterprise 2019 LTSC
  - MS Windows Server 2008 R2 SP1
  - MS Windows Server 2012 R2 Standard
  - MS Windows Server 2016 Standard
  - MS Windows Server 2019 Standard
- On operator station (for Safety Matrix Viewer) under:
  - MS Windows 7 Ultimate SP1 (32-bit)
  - MS Windows 7 SP1 (64-bit) (Ultimate, Enterprise, Professional)
  - MS Windows 10 Enterprise 2015 LTSC
  - MS Windows 10 Enterprise 2019 LTSC
  - MS Windows Server 2008 R2 SP1
  - MS Windows Server 2012 R2 Standard
  - MS Windows Server 2016 Standard
  - MS Windows Server 2019 Standard

##### SIMATIC S7 Safety Matrix Tool V6.3

Creation, configuration, compilation and loading of the SIMATIC S7 Safety Matrix as well as operator control and monitoring in a SIMATIC PCS 7 environment

2 languages (German, English), software class A, floating license for 1 user

Without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 Safety Matrix Software Media Package per order item
- Online delivery  
License key download and online Certificate of License, combined with SIMATIC S7 Safety Matrix Software Media Package (software download and online Certificate of License)  
Note: Email address required; installation software also available separately as SIMATIC S7 Safety Matrix Software Media Package.

**6ES7833-1SM03-0YA5**

**6ES7833-1SM03-0YH5**

Ordering data	Article No.	Article No.
<b>SIMATIC S7 Safety Matrix Viewer V6.3</b> For operator control and monitoring of the SIMATIC S7 Safety Matrix via OS Single Station/OS Client Runtime software, 2 languages (German, English), software class A, floating license for 1 user Without SIMATIC PCS 7 Software Media Package <ul style="list-style-type: none"> <li>• Goods delivery License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 Safety Matrix Software Media Package per order item</li> <li>• Online delivery License key download and online Certificate of License, combined with SIMATIC S7 Safety Matrix Software Media Package (software download and online Certificate of License) Note: Email address required; installation software also available separately as SIMATIC S7 Safety Matrix Software Media Package.</li> </ul>	<b>6ES7833-1SM63-0YA5</b>  <b>6ES7833-1SM63-0YH5</b>	<b>SIMATIC S7 Safety Matrix Software Media Package</b> <b>SIMATIC S7 Safety Matrix Software Media Package V6.3 (incl. SP)</b> Installation software without license, 2 languages (German, English), software class A Without SIMATIC PCS 7 Software Media Package Note: Can only be used in conjunction with a valid license. <ul style="list-style-type: none"> <li>• Goods delivery Software on DVD and Certificate of License</li> <li>• Online delivery Software download and online Certificate of License Note: Email address required!</li> </ul> <b>Upgrades for SIMATIC S7 Safety Matrix Tool and SIMATIC S7 Safety Matrix Viewer</b> See "Safety Integrated Upgrades for Process Automation", chapter "Update/upgrade packages", section "Updates/upgrades asynchronous to the PCS 7 version"
		<b>6ES7833-4SM36-0YT8</b>  <b>6ES7833-4SM36-0YG8</b>

### Technical specifications

	Safety lifecycle support	Operating modes	Hardware requirements	Software requirements
SIMATIC S7 Safety Matrix Tool V6.3	Complete lifecycle: <ul style="list-style-type: none"> <li>• Analysis phase</li> <li>• Implementation phase</li> <li>• Operation and maintenance phase</li> </ul>	Offline, online	SIMATIC PCS 7 with safety-related automation systems (SIMATIC S7 F Systems RT license integrated) Installation basis: SIMATIC PCS 7 Engineering Station	<ul style="list-style-type: none"> <li>• Microsoft Windows operating system (in line with the software requirements of the SIMATIC PCS 7 version)</li> <li>• For offline testing: S7-PLCSIM or SIMIT</li> <li>• SIMATIC S7 F Systems V6.1 SP2 and higher</li> </ul>
SIMATIC S7 Safety Matrix Viewer V6.3	Operating phase (operator control and monitoring)	Online	SIMATIC PCS 7 with safety-related automation systems (SIMATIC S7 F Systems RT license integrated) Installation basis: SIMATIC PCS 7 Operator Station, single station or client version	Microsoft Windows operating system (in line with the software requirements of the SIMATIC PCS 7 version)

System requirements for SIMATIC S7 Safety Matrix

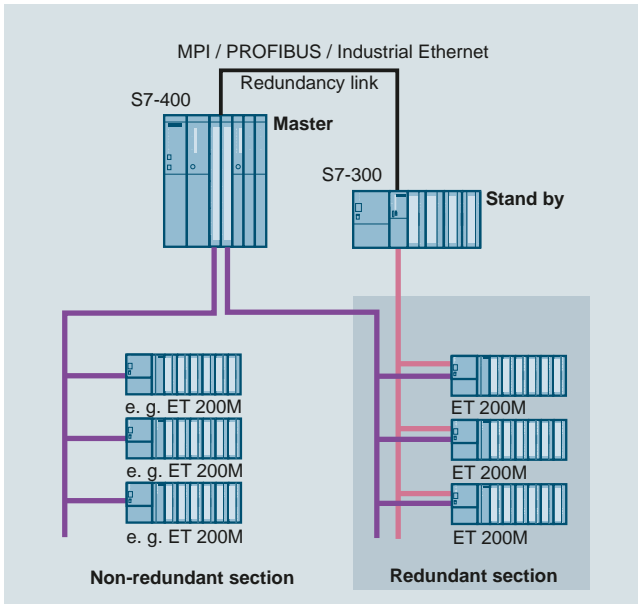
## Software for SIMATIC Controllers

STEP 7 V5.x

Options for programming and design

### Software redundancy

#### Overview



- Software package for assembling fault-tolerant control systems based on software
- Designed for control systems with single-channel distributed I/O
- For use in applications with low demands on changeover speed, such as the control of hydroelectric power plants, cooling circuits, traffic flows, level control, measured data acquisition
- Inexpensive thanks to the use of standard S7-300 and S7-400 components
- I/O linking with PROFIBUS DP in redundant configuration
- Optional control via WinCC operator station

#### Ordering data

#### Article No.

##### Program package software redundancy V1.2

###### Task:

Configuring a redundant control.

###### Target system:

SIMATIC S7-300, S7-400

###### Requirement:

STEP 7 V5.2, NCM S7 for PROFIBUS

###### Delivery package:

incl. electronic documentation (English, German, French, Spanish, Italian), 4 application examples and faceplate for WinCC on CD-ROM

Single license (for 2 CPUs)

**6ES7862-0AC01-0YA0**

Single license, without software and documentation

**6ES7862-0AC01-0YA1**

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual:  
 LOGO!, SIMADYN,  
 SIMATIC bus components,  
 SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI,  
 SIMATIC Sensors, SIMATIC NET,  
 SIMATIC PC-based Automation,  
 SIMATIC PCS 7, SIMATIC PG/PC,  
 SIMATIC S7, SIMATIC software,  
 SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

#### Technical specifications

##### Technical specifications

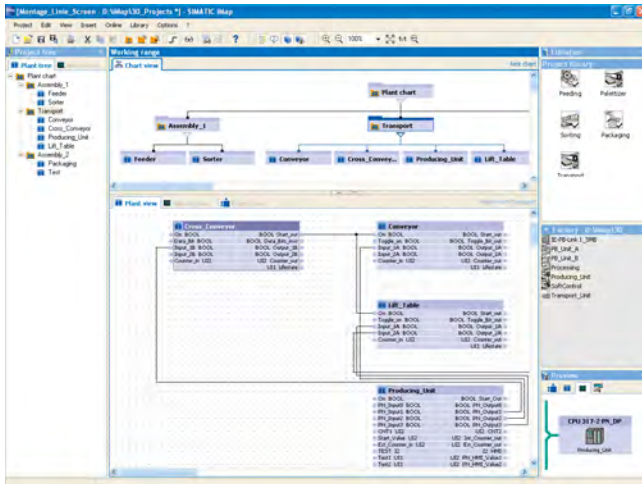
###### Hardware requirements

CPU	S7-300: CPU 313C-2 DP, 314C-2 DP, 315-2 DP, 316-2 DP, 318-2 DP S7-400: all CPUs
Redundancy link of the CPUs	MPI, PROFIBUS, Industrial Ethernet; existing connections can also be used.
Suitable modules for ET 200M	IM 153-2; all DI/O, AI/O for ET 200M; FM 350-1 counter module CP 341

###### Software requirements

Configuring/programming	STEP 7 V4.0
Communication configuration for redundant PROFIBUS DP	NCM S7 for PROFIBUS

## Overview



- Component-based software tool for configuring the communication in distributed automation solutions
- For easy graphical configuration of the communication between subsystems and machine-to-machine communication in the production line
- Based on the PROFINET standard
- Open for PROFINET devices from various manufacturers on Industrial Ethernet
- Runs under Windows XP Professional and Windows 7 Ultimate/Professional

### Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to version 3.0 is available for users of previous versions.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<https://www.siemens.com/simatic-licenses>

## Ordering data

### SIMATIC iMap V3.0

#### Target system:

CPU 31x-2 PN/DP, CPU 319-3 PN/DP, SIMATIC WinAC PN, SIMATIC NET IE/PB Link, SIMATIC NET CP 343-1, SIMATIC NET CP 343-1 Advanced, SIMATIC NET CP 443-1 Advanced, distributed I/O devices with own CPU, PROFINET CBA OPC server, devices on Industrial Ethernet based on the PROFINET CBA standard, SIMATIC OPs, SIMATIC ProTool/Pro

#### Requirements:

Windows XP Prof. with Service Pack 2 or higher or Windows 7 Ultimate/Professional; on PG or PC with Pentium processor, min. 1 GHz; STEP 7 V5.3 Service Pack 3 or higher, PN OPC Server V6.3 or higher

#### Type of delivery:

German, English, with electronic documentation

Floating license

Upgrade to V3.0, floating license

## Article No.

**6ES7820-0CC04-0YA5**

**6ES7820-0CC04-0YE5**

# Software for SIMATIC Controllers

STEP 7 V5.x

Options for programming and design

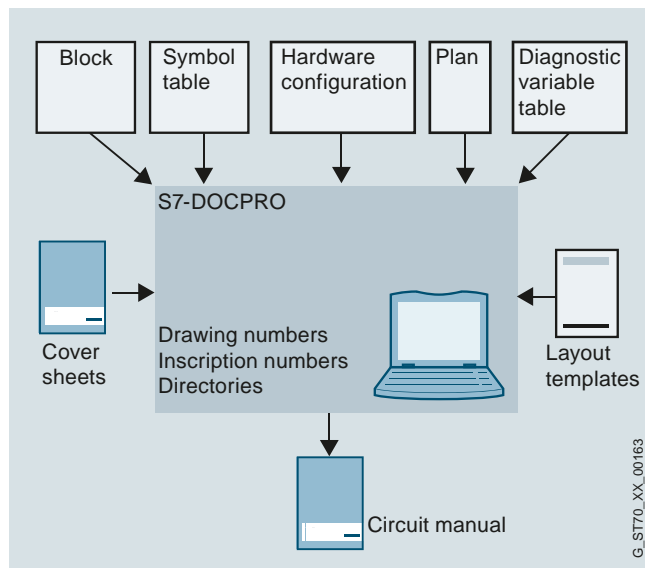
## SIMATIC iMap

### Technical specifications

Engineering tool	SIMATIC iMap
Current version	V3.0
Software class	A
<b>Application areas</b>	
Keyword	SIMATIC iMap is an engineering tool for configuring communication between automation and field devices in distributed automation solutions.
Marketing message	"Time and cost savings in modular machine and plant construction with Component Based Automation." "Modularization and machine-to-machine communication along the production line."
Advantages	<ul style="list-style-type: none"> <li>• Open component-based engineering tool to the PROFINET standard.</li> <li>• Simple communication between intelligent automation and field devices on PROFIBUS DP and on Ethernet.</li> <li>• Graphical configuration of communication on PROFIBUS DP and on Ethernet</li> <li>• Extremely high reusability of software components (technology modules)</li> <li>• Graphical structuring of the plant using "chart-in-chart" function</li> <li>• Convenient navigation through the project tree</li> <li>• Easy creation and structuring of technology libraries</li> <li>• PROFIBUS and Ethernet in the overview of the network view</li> <li>• Fast start-up thanks to downloading and testing directly on Ethernet (also of PROFIBUS slaves)</li> <li>• Online display of values of the technology modules on the interfaces and in the variable table</li> <li>• Diagnosis of communication in the diagnostics window</li> <li>• Automotive industry (especially in assembly, conveyor systems and in the paint shop)</li> <li>• Complex food and packaging machines</li> <li>• Conveyor systems based on PROFIBUS DP</li> <li>• Production lines with several interlinked machines</li> </ul>
Sectors	

Engineering tool	SIMATIC iMap
<b>Target systems</b>	
	<ul style="list-style-type: none"> <li>• SIMATIC S7 CPU 31x-2 PN/DP and SIMATIC S7 CPU 319-3 PN/DP (with integrated PROFINET interface. This can be used as a proxy function for the devices of a complete PROFIBUS segment, one line only)</li> <li>• SIMATIC WinAC PN (can be used as a proxy function for the devices of a complete PROFIBUS segment, one line only)</li> <li>• SIMATIC NET IE/PB Link (can be used as a proxy function for the devices of a complete PROFIBUS segment)</li> <li>• SIMATIC NET CP 343-1 and CP 343-1 Advanced (for connecting SIMATIC S7-300 to Ethernet), CP443-1 Advanced (for connecting SIMATIC S7-400 to Ethernet)</li> <li>• Distributed I/O stations with separate CPU (all intelligent field devices on PROFIBUS such as SIMATIC CPU 313C-2DP, CPU 314C-2DP, CPU 315-2DP, CPU 316-2DP, ET 200 IM 151 CPU, ET 200S BM 147 CPU),</li> <li>• PROFINET CBA OPC Server (for access from PC applications to data in PROFINET devices)</li> <li>• Devices on Industrial Ethernet based on the PROFINET CBA standard</li> <li>• SIMATIC OPs (within the components)</li> <li>• SIMATIC ProTool/Pro, WinCC or any other visualization system with OPC client function</li> </ul>
<b>System requirements</b>	
Operating system	Windows XP Prof. with Service Pack 2 or Windows 7 Ultimate/Professional; PC administration rights are required for installation
PG/PC hardware	Pentium processor, 1 GHz or higher
Recommended expansion of main memory in PG/PC	Work memory: 512 MB or more
Hard disk space required in PG/PC	Approx. 200 MB
Software required	<ul style="list-style-type: none"> <li>• STEP 7 V5.3 Service Pack 3 or higher</li> <li>• PN OPC-Server V6.3 or higher</li> </ul> The following software must be installed before iMap (included in the iMap package): <ul style="list-style-type: none"> <li>• MS Internet Explorer V6.0 Service Pack 1 and higher</li> <li>• Adobe Acrobat Reader V5.0</li> </ul>
<b>Type of delivery</b>	
Languages	English, German, French, Italian and Spanish
Single License (SL)	Yes
Upgrade License (UL)	Yes, from V2.0 to V3.0
Paper manuals	Electronically on CD
<b>Authorization/licenses</b>	
Authorization	Yes
Single License (SL)	Yes
Upgrade License (UL)	Yes
Software Update Service	Yes
Unlock Copy License	No

#### Overview



- For creating and managing plant documentation
- Permits structuring of project data, preparation in the form of wiring manuals, and uniform printouts
- For use in SIMATIC S7-300, S7-400 and C7

#### Licensing

- SIMATIC S7 DOCPRO is supplied with a floating license. The floating license allows the software to be installed on any number of computers. This means one user can use the software on any computer, or from one specific workstation per license. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- A separate S7-DOCPRO update service is available for ordering.
- An upgrade to version 5.4 is available for users of previous versions.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here: <http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### DOCPRO, Version 5.4

**Task:**  
Creation of circuit manuals for plant documentation management

**Target system:**  
SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7

**Requirement:**  
from STEP 7 V5.4

**Delivery package:**  
on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation

Floating license

**6ES7803-0CC03-0YA5**

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7803-0CA01-0YX2**

Floating license upgrade to V5.4

**6ES7803-0CC03-0YE5**

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

<sup>1)</sup> For more information on the software update service, see page 12/2.

#### Technical specifications

Engineering Tool	DOCPRO
Type of license	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300/400 SIMATIC C7
Operating system	Windows XP Professional Windows 7 Ultimate/Professional from DOCPRO V5.4 SP1
Required software packages	STEP 7, V5.4 and higher; for operation under Windows 7 STEP 7, V5.5 and higher
Disk space required in PG/PC	5 MB

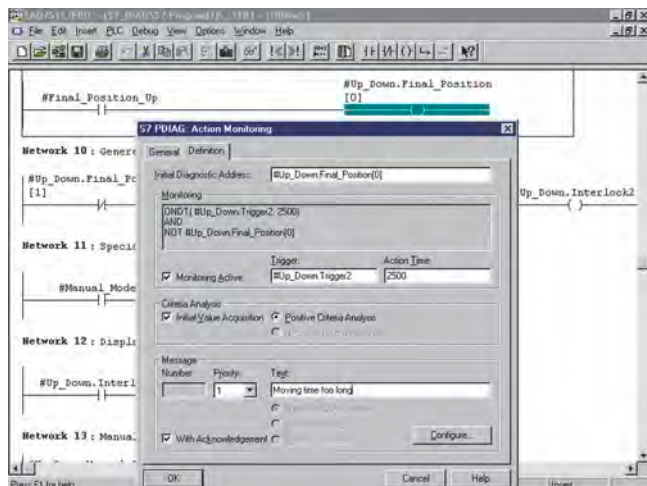
# Software for SIMATIC Controllers

STEP 7 V5.x

Options for diagnostics and service

## S7-PDIAG

### Overview



- For configuration of process diagnostics with SIMATIC S7
- Increases the availability of machines and production plants and provides supports with fault analysis and elimination on-site
- For use on the SIMATIC S7-300, S7-400

#### Licensing

- S7-PDIAG V5.7 is supplied with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a certain workplace. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.7 is offered for users of the previous versions.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

### Ordering data

### Article No.

#### S7-PDIAG, Version 5.7

**Task:**  
Configuring of process diagnostics for LAD/FBD/STL

**Target system:**  
SIMATIC S7-300  
(CPU 314 and higher);  
SIMATIC S7-400

**Requirement:**  
From STEP 7 V5.7  
under Windows Server 2016,  
Windows Server 2019,  
Windows 10 Professional,  
Windows 10 Enterprise

**Form of delivery:**  
on CD; German, English, French,  
Spanish, Italian; incl. authorization  
diskette, with electronic  
documentation

Floating license

**6ES7840-0CC08-0YA5**

Software Update Service  
(requires current software version)<sup>1)</sup>

**6ES7840-0CA01-0YX2**

Upgrade to V5.7

**6ES7840-0CC08-0YE5**

#### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD,  
multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7, SIMATIC distributed  
I/O, SIMATIC HMI,  
SIMATIC Sensors, SIMATIC NET,  
SIMATIC PC-based Automation,  
SIMATIC PCS 7, SIMATIC PG/PC,  
SIMATIC S7, SIMATIC software,  
SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD  
and the three subsequent updates

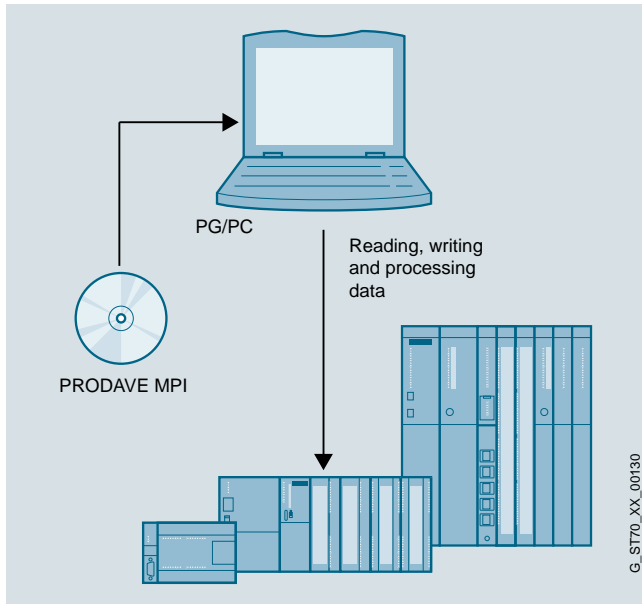
<sup>1)</sup> For more information on the software update service, see page 12/2.

### Technical specifications

Engineering Tool	S7-PDIAG
Type of license	Floating license
Software class	A
Current version	V5.7
Target system (recommended)	SIMATIC S7-300 (CPU 314 or higher) SIMATIC S7-400
Operating system	Windows Server 2016, Windows Server 2019, Windows 10 Professional, Windows 10 Enterprise
Required software packages	STEP 7 V5.7 or higher
Disk space required in PG/PC	26 MB



## Overview



- The toolbox for exchange of process data between SIMATIC S7, SIMATIC C7 and a PG/PC
- For autonomous handling of data traffic over MPI/PPI, PROFIBUS and Industrial Ethernet

**Licensing**

- PRODAVE is supplied with a single license. The single license permits the software to be installed on just one computer.
- It is possible to acquire a single license without software and documentation for installation on more than one computer.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

**Technical specifications**

Parameterization software	PRODAVE
Type of license	Simple license, copy license
Software class	A
Current version	V6.2
Target system	SIMATIC S7-200 SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case)
Required software packages	-
Main memory configuration in target system	8 MB on PG/PC
Disk space required in PG/PC	2 MB
<b>Standard FBs</b>	
Required libraries	-

**Ordering data****Article No.****PRODAVE MPI/IE V6.2 for Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case)****Task:**

Data link between PG/PC and SIMATIC S7/C7 via MPI (S7-200 via PPI) or Industrial Ethernet

**Requirements:**

Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case); CP 5611, integrated MPI or PC adapter

**Delivery package:**  
CD incl. electr. documentation (German, English)

Single license

**6ES7807-4BA03-0YA0**

Copy license, without software and documentation

**6ES7807-4BA03-0YA1**

**PRODAVE MPI Mini V6.0 for Windows 95/98/ME/NT 4.0/2000 Prof./XP Prof.****Task:**

Data link between PG/PC and SIMATIC S7/C7 over MPI (S7-200 over PPI); with reduced functional scope

**Requirement:**

Windows 95/98/ME/NT 4.0/2000 Prof./XP Prof.; CP 5611, integrated MPI or PC adapter

**Delivery package:**  
CD incl. electr. documentation (German, English)

Single license

**6ES7807-3BA01-0YA0**

Copy license, without software and documentation

**6ES7807-3BA01-0YA1**

**SIMATIC Manual Collection**

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection update service for 1 year**

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

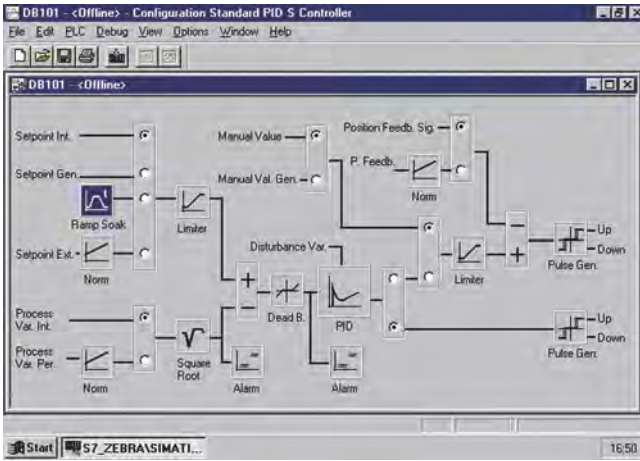
# Software for SIMATIC Controllers

STEP 7 V5.x

Options for technology and drive systems

[Loadable function blocks](#) > [Standard PID Control](#)

## Overview



- For integrating continuous PID controllers, pulse controllers and step controllers in the application program
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

### Licensing

- The Standard PID Control consists of a parameterization tool (engineering software) and function blocks (runtime software).
- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required per CPU on which they are used.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

## Ordering data

## Article No.

### Standard PID Control parameterization tool, V5.2

Task:  
Parameter assignment tool for standard controllers

Requirement:  
STEP 7 V5.6 or higher  
Type of delivery:  
With electronic manual/Getting Started English, German; incl. authorization diskette

Floating license

6ES7830-2AA22-0YX0

### Standard function blocks for Standard PID Control, V5.2

Task:  
Standard FBs for standard controllers  
Target system:  
SIMATIC S7-300 (CPU 313 or higher), S7-400

Type of delivery:  
With electronic manual/Getting Started English, German

Single license

6ES7860-2AA21-0YX0

Single license without software and documentation

6ES7860-2AA21-0YX1

### SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

### SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current "Manual Collection" DVD and the three subsequent updates

**Technical specifications**

Parameterization software	Standard PID Control					
Type of license	Single license					
Software class	A					
Current version	V5.2 SP4					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7					
Required software packages	STEP 7 V5.6 or higher					
Main memory configuration in PG/PC	16 MB					
Disk space required in PG/PC	1.85 MB					
Standard function blocks	PID_CP (FB 1)		PID_ES (FB 2)		LP_SCHED (FC 1)	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	8956 bytes	7796 bytes	9104 bytes	7982 bytes	1064 bytes	976 bytes
• DB length in the memory	1168 bytes	510 bytes	1124 bytes	484 bytes	184 bytes <sup>2)</sup>	100 bytes <sup>2)</sup>
Runtimes						
• In S7-300 <sup>1)</sup>	0.18 - 4.4 ms		0.2 - 5.1 ms		0.03 - 0.3 ms	
• In S7-400 <sup>1)</sup>	0.13 - 0.35 ms		0.16 - 0.35 ms		0.03 - 0.08 ms	
Required libraries	Standard PID Control FBs					
Licensing forms	Simple license and 1 runtime license; 1 runtime license					
Software class	A					
Current version	V5.2 SP3					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7					
Required software packages	STEP 7 V5.6 or higher					
Main memory configuration in PG/PC	16 MB					
Disk space required in PG/PC	1.85 MB					

<sup>1)</sup> Depending on the CPU

<sup>2)</sup> With 5 control loops

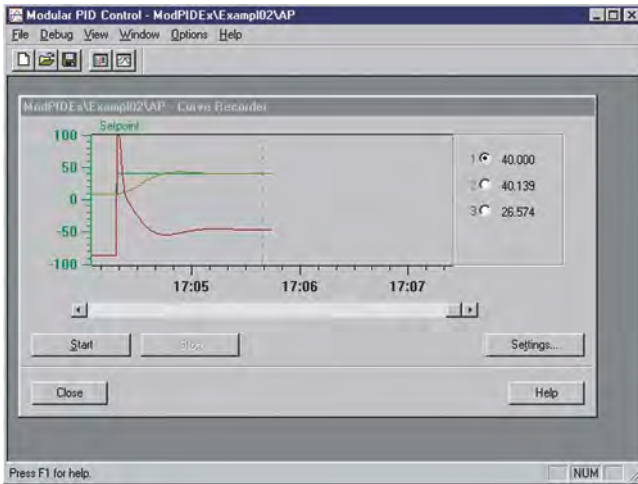
## Software for SIMATIC Controllers

STEP 7 V5.x

Options for technology and drive systems

Loadable function blocks &gt; Modular PID Control

### Overview



- For creating complex closed-loop control structures
- Preferred for implementation in closed-loop control equipment in mid-range and high-end applications and in process engineering
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

#### Licensing

- The Modular PID Control consists of a parameterization tool (engineering software) and function blocks (runtime software).
- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required per CPU on which they are used.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

### Ordering data

### Article No.

#### Modular PID Control commissioning tool, V5.1 for SIMATIC S7 and WinAC

Task:  
Commissioning tool for modular PID controllers  
Requirement:  
STEP 7 V5.6 or higher  
Type of delivery:  
With electronic manual, English, German; incl. authorization diskette

Floating license

6ES7830-1AA11-0YX0

#### Standard function blocks for Modular PID Control, V5.1

Task:  
Standard FBs for modular PID controllers  
Target system:  
SIMATIC S7-300 (CPU 313 or higher), S7-400, WinAC  
Type of delivery:  
English, German; with electronic manual

Single license

6ES7860-1AA10-0YX0

Single license, without software and documentation

6ES7860-1AA10-0YX1

#### SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD, multilingual:  
LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current "Manual Collection" DVD and the three subsequent updates

### Technical specifications

Parameterization software	Modular PID Control
Type of license	Single license
Software class	A
Current version	V5.1 SP4
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7
Required software packages	STEP 7 V5.6 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB
Processor, at least	486
Windows swap area, approx.	20 MB (max. possible)

## Technical specifications

Standard function blocks	A_DEAD_B		CRP_IN		CPR_OUT	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	898 bytes	692 bytes	182 bytes	70 bytes	206 bytes	96 bytes
• DB length in the memory	186 bytes	44 bytes	122 bytes	20 bytes	114 bytes	14 bytes
Runtimes in S7-300	0.13 to 0.17 ms		0.06 ms		0.18 to 0.22 ms	
Runtimes in S7-400	0.01 to 0.03 ms		0.01 to 0.02 m		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	DEAD_T		DEAD_BAND		DIF	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	532 bytes	394 bytes	232 bytes	120 bytes	410 bytes	268 bytes
• DB length in the memory	142 bytes	22 bytes	114 bytes	16 bytes	158 bytes	30 bytes
Runtimes in S7-300	0.26 to 0.33 ms		0.16 to 0.21 ms		0.55 to 0.71 ms	
Runtimes in S7-400	0.02 to 0.06 m		0.01 to 0.03 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	ERR_MON		INTEG		LAG1ST	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	558 bytes	360 bytes	488 bytes	314 bytes	534 bytes	368 bytes
• DB length in the memory	206 bytes	52 bytes	168 bytes	36 bytes	156 bytes	30 bytes
Runtimes in S7-300	0.27 to 0.35 ms		0.40 to 0.51 ms		0.52 to 0.67 ms	
Runtimes in S7-400	0.01 to 0.05 ms		0.02 to 0.07 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	LAG2ND		LIMALARM		LIMITER	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	690 bytes	516 bytes	390 bytes	240 bytes	262 bytes	140 bytes
• DB length in the memory	190 bytes	46 bytes	152 bytes	28 bytes	124 bytes	20 bytes
Runtimes in S7-300	0.88 to 1.14 ms		0.47 to 0.61 ms		0.14 to 0.17 ms	
Runtimes in S7-400	0.04 to 0.16 ms		0.02 to 0.07 ms		0.03 to 0.01 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	LMNGEN_C		LMNGEN_S		NONLIN	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1576 bytes	1280 bytes	2578 bytes	2152 bytes	826 bytes	672 bytes
• DB length in the memory	276 bytes	80 bytes	360 bytes	110 bytes	138 bytes	18 bytes
Runtimes in S7-300	0.32 to 0.41 ms		1.16 to 1.47 ms		0.32 to 0.41 ms	
Runtimes in S7-400	0.02 to 0.06 ms		0.06 to 0.18 ms		0.02 to 0.07 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

# Software for SIMATIC Controllers

STEP 7 V5.x

Options for technology and drive systems

## Loadable function blocks > Modular PID Control

### Technical specifications

Standard function blocks	NORM		OVERRIDE		PARA_CTL	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	234 bytes	122 bytes	362 bytes	214 bytes	406 bytes	232 bytes
• DB length in the memory	130 bytes	24 bytes	146 bytes	28 bytes	234 bytes	82 bytes
Runtimes in S7-300	0.33 to 0.43 ms		0.15 to 0.18 ms		0.12 to 0.15 ms	
Runtimes in S7-400	0.02 to 0.07 ms		0.01 to 0.04 ms		0.01 to 0.03 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	PID		PULSEGEN		RMP_SOAK	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1560 bytes	1242 bytes	1110 bytes	872 bytes	1706 bytes	1500 bytes
• DB length in the memory	340 bytes	98 bytes	190 bytes	34 bytes	212 bytes	62 bytes
Runtimes in S7-300	1.15 to 1.46 ms		0.17 to 0.20 ms		0.16 to 0.20 ms	
Runtimes in S7-400	0.06 to 0.18 ms		0.01 to 0.05 ms		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	ROC_LIM		SCALE		SP_GEN	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1242 bytes	980 bytes	136 bytes	32 bytes	658 bytes	484 bytes
• DB length in the memory	222 bytes	50 bytes	114 bytes	16 bytes	164 bytes	40 bytes
Runtimes in S7-300	0.53 to 0.68 ms		0.10 to 0.13 ms		0.27 to 0.35 ms	
Runtimes in S7-400	0.02 to 0.09 ms		0.01 to 0.02 ms		0.02 to 0.06 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	SPLT_RAN		SWITCH		LP_SCHED	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	304 bytes	180 bytes	238 bytes	116 bytes	1104 bytes	972 bytes <sup>1)</sup>
• DB length in the memory	138 bytes	28 bytes	118 bytes	18 bytes	234 bytes	64 bytes <sup>1)</sup>
Runtimes in S7-300	0.09 to 0.11 ms		0.07 to 0.09 ms		0.28 to 0.34 ms	
Runtimes in S7-400	0.01 to 0.02 ms		0.01 to 0.03 ms		0.03 to 0.08 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

1) With 5 control loops

Standard FBs in general	
Required libraries	Modular PID Control FBs
Licensing forms	Simple license and 1 runtime license; 1 runtime license
Software class	A
Current version	V5.1 SP3
Required software packages	STEP 7 V5.6 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB

#### Overview

- PID Self-Tuner: For expanding existing PID controllers to create self-tuning PI or PID controllers.
- Optimization of PI or PID controllers with 3-step action (HEATING – OFF – COOLING)
- Convenient online initial setting and online adaptation during operation
- Ideally applicable to temperature controllers, but also suitable for level and flow controllers
- Can be used with SIMATIC S7-300 (CPU 313 or higher), SIMATIC S7-400 and WinAC; in combination with PID Control (integrated in STEP 7), Standard PID Control, Modular PID Control, FM 355, FM 455 as well as with any PID algorithm

#### Licensing

- The PID Self-Tuner complements the Standard PID Control or Modular PID Control software packages.
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required for each CPU on which they are used.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### PID Self-Tuner V5.1

Task:  
Online tuning for PID controller  
Target system:  
SIMATIC S7-300  
(CPU 313 or higher),  
S7-400, WinAC  
Type of delivery:  
Standard function blocks, electronic  
manual and Getting Started  
English/German

Single license

**6ES7860-4AA01-0YX0**

Single license, without software and  
documentation

**6ES7860-4AA01-0YX1**

##### SIMATIC Manual Collection

Electronic manuals on DVD,  
multilingual:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7, SIMATIC distributed  
I/O, SIMATIC HMI,  
SIMATIC Sensors, SIMATIC NET,  
SIMATIC PC-based Automation,  
SIMATIC PCS 7, SIMATIC PG/PC,  
SIMATIC S7, SIMATIC software,  
SIMATIC TDC

**6ES7998-8XC01-8YE0**

##### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD  
and the three subsequent updates

**6ES7998-8XC01-8YE2**

#### Technical specifications

Parameterization software	PID Self-Tuner			
Type of license	-			
Software class	-			
Current version	-			
Target system	-			
Operating system	-			
Required software packages	-			
Main memory configuration in PG/PC	-			
Disk space required in PG/PC	-			
<b>Standard FBs</b>	-			
<b>PID Self-Tuner</b>	<b>TUN_EC</b>		<b>TUN_ES</b>	
Storage space requirements	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	approx. 6542 bytes	approx. 5956 bytes	6332 bytes	5714 bytes
• DB length in the memory	644 bytes	294 bytes	638 bytes	288 bytes
Runtimes				
• In S7-300	1.0 ms to 1.5 ms <sup>1)</sup>		1.0 ms to 1.5 ms <sup>1)</sup>	
• In S7-400	0.06 ms to 0.19 ms <sup>1)</sup>		0.06 ms to 0.19 ms <sup>1)</sup>	
Required libraries	PID Self-Tuner FBs V5.1			
Licensing forms	-			
Software class	A			
Current version	V5.1 SP3			
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7-620			
Required software packages	STEP 7 V5.6 or higher			
Main memory configuration in PG/PC	-			
Disk space required in PG/PC	-			

<sup>1)</sup> Depending on the CPU selected

## Software for SIMATIC Controllers

STEP 7 V5.x

Options for technology and drive systems

### S7-Technology

#### Overview

- Option package for creating motion control applications for CPU 31xT and CPU 317TF
- Optimal embedding in the automation world thanks to total integration in the STEP 7 tools
- Programming in the standard SIMATIC programming languages LAD, FBD and STL
- Additional Engineering Tools such as S7-SCL or S7-GRAPH can be used

#### Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### S7 Technology V4.2

###### Task:

Option package for configuring and programming technology tasks with SIMATIC S7 CPU 31xT and SIMATIC S7 CPU 317TF

###### Requirement:

STEP 7 V5.6 and higher

###### Type of delivery:

on DVD

Incl. documentation for CPU 31xT, CPU 317TF (included on DVD)

###### Floating license

Floating license for 1 user, license key download without software or documentation<sup>1)</sup>; Email address required for delivery

**6ES7864-1CC42-0YA5**

**6ES7864-1CC42-0XH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



### Overview



- Low-priced package for simple, controlled positioning and simple geared synchronous motion
- For use with any standard variable-speed drive, such as frequency converter or servo drive
- For incremental and absolute encoders

#### Licensing

- The engineering interface for STEP 7 up to V5.5 is included in Easy Motion Control V2.1 and can be installed without license.
- The function blocks of Easy Motion Control require one runtime license for each CPU onto which they are loaded. Easy Motion Control V2.1 includes a runtime single license; other licenses can be ordered separately.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Note of product versions

Easy Motion Control is an option for STEP 7 V5.x or STEP 7 Professional 2010/17 for controllers of the SIMATIC S7-300/S7-400 series and WinAC. When using STEP 7 (TIA Portal) to program these controllers, you require the optional package Easy Motion Control (TIA Portal)

#### Ordering data

#### Article No.

##### Easy Motion Control V2.1

6ES7864-0AC01-0YX0

##### Requirement:

STEP 7 V5.3 SP2 up to V5.5

##### Type of delivery:

Software and documentation in 2 languages (English, German) on CD and CoL for one runtime single license

##### Easy Motion Control Runtime License

6ES7864-0AF01-0YX0

##### Type of delivery:

CoL for one runtime single license (valid for Easy Motion Control V2.x and V11 or higher), without software or documentation

### Technical specifications

#### Supported hardware:

Easy Motion Control is runnable on the following CPUs:

- S7-300.
- S7-400.
- WinAC.
- ET 200S.
- ET 200pro.

Supported modules for the measuring of actual values:

- CPU 314C (FW version 2.0 of the CPU or higher).
- ET 200S 1 Count 5V/500 kHz.
- ET 200S 1 Count 24V/100kHz.
- ET 200S 1SSI.
- SM 338.
- FM 350-1, FM 450-1.
- SIMODRIVE Sensor with PROFIBUS DP.
- IM 174.
- Other modules for measuring actual values (using free driver).

Supported modules for setpoint output:

- ET 200S 2AO U.
- SM 332.
- SM 432.
- IM 174.
- Other modules for setpoint output (using free driver).

Supported drives using PROFIBUS DP:

- Micromaster 4.
- SINAMICS G120.
- SINAMICS S120.

#### Storage space requirements

Required work memory in bytes		
Block	Required work memory per block	Additional work memory required per instance
MC_Init	1086	-
MC_MoveAbsolute	3924	112
MC_MoveRelative	2982	110
MC_MoveJog	3110	110
MC_Home	2886	104
MC_StopMotion	1114	70
MC_Control	1756	58
MC_Simulation	410	64
MC_GearIn	3476	128
Input driver	1416 ... 2654	76 ... 128
Output driver	384 ... 1242	52 ... 68
Axis data block	-	294

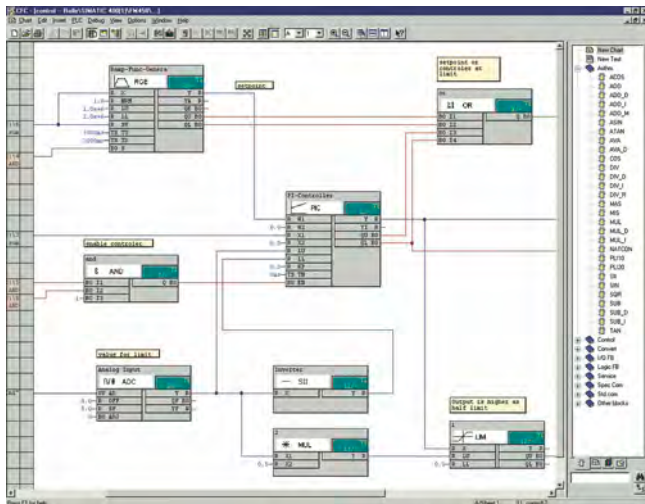
# Software for SIMATIC Controllers

## STEP 7 V5.x

### Options for technology and drive systems

#### D7-SYS

#### Overview



- Optional package for STEP 7 V5.6 for configuring closed-loop control and automation tasks with SIMATIC TDC, FM 458-1 DP and T400
- Extensive block library
- Generation of user libraries in ANSI C with D7-FB-GEN function block generator

#### Licensing

- D7-SYS is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 9.0 is available for users of the previous 8.x version.
- A separate update service can be purchased for D7-SYS.
- As of version 8.1, the D7-FB-GEN block generator that was previously sold separately is included in the D7-SYS scope of delivery.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### SIMATIC D7-SYS V9.0

Reference hardware:  
SIMATIC TDC, FM 458-1 DP, T400

Requirement:

MS Windows 7 Professional with SP1 (64-bit) (English language version only)  
MS Windows 7 Ultimate and Enterprise with SP1 (64-bit)  
MS Windows 10 Pro and Enterprise (64-bit)  
MS Windows Server 2008 R2 Standard Edition with SP1 (64-bit)  
MS Windows Server 2012 R2 Standard Edition (64-bit)  
MS Windows Server 2016 Standard Edition (64-bit)  
STEP 7 V5.6

Type of delivery:

On DVD, en, de, with electronic documentation

Floating license

**6ES7852-0CC06-0YA5**

Upgrade license from V8.x to V9.0

**6ES7852-0CC06-0YE5**

Software Update Service<sup>1)</sup>

**6ES7852-0CC01-0YL5**

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language:  
LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI,  
SIMATIC Sensors, SIMATIC NET,  
SIMATIC PC-based Automation,  
SIMATIC PCS 7, SIMATIC PG/PC,  
SIMATIC S7, SIMATIC software,  
SIMATIC TDC

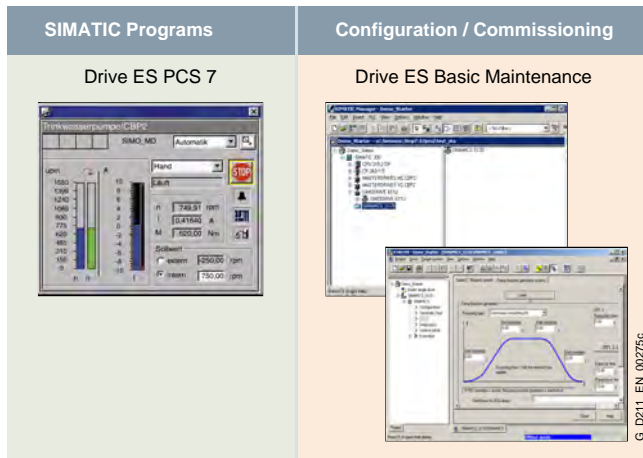
##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

<sup>1)</sup> For more information on the software update service, see page 12/2.

## Overview



Drive ES is the engineering system used to integrate the communication, configuration and data management functions of Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively.

The following software packages are available for selection:

- Drive ES Basic Maintenance
- Drive ES PCS 7

Drive ES (**Drive Engineering Software**) fully integrates drives from Siemens into the world of Totally Integrated Automation.

## Ordering data

## Article No.

## Article No.

**Drive ES Basic Maintenance V5.6 SPx <sup>1)</sup>**

Configuration software for the integration of drives into TIA (Totally Integrated Automation)

Requirement:

STEP 7 V5.4 SP4 or higher

Type of delivery:

DVD-ROM

Languages:

en, de, fr, it, es

with electronic documentation

- Floating license, 1 user

**6SW1700-5JA00-6AA0**

**Drive ES PCS 7 V8.2 SPx <sup>1)</sup>**

Block library for PCS 7 for the integration of drives in Classic Style (as predecessor)

Requirement:

PCS 7 V8.2 and higher

Type of delivery:

CD-ROM

Languages:

en, de, fr, it, es

With electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data storage medium)
- Update service for single-user license
- Upgrade from V6.x/V7.x/V8.x to V8.2 SPx <sup>1)</sup>

**6SW1700-8JD00-2AA0**

**6SW1700-5JD00-1AC0**

**6SW1700-0JD00-0AB2**

**6SW1700-8JD00-2AA0**

**Drive ES PCS 7 APL V8.2 SPx <sup>1)</sup>**

Block library for PCS 7 for the integration of drives in APL Style (Advanced Process Library)

Requirement:

PCS 7 V8.2 and higher

Type of delivery:

CD-ROM

Languages:

en, de, fr, it, es

With electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data storage medium)
- Update service for single-user license
- Upgrade of APL V8.x to V8.2 SPx <sup>1)</sup> or Drive ES PCS 7 V6.x, V7.x, V8.x classic to Drive ES PCS 7 APL V8.2 SPx <sup>1)</sup>

**6SW1700-8JD01-2AA0**

**6SW1700-5JD00-1AC0**

**6SW1700-0JD01-0AB2**

**6SW1700-8JD01-2AA0**

**Drive ES PCS 7 V9.0 SPx <sup>1)</sup>**

Block library for PCS 7 for the integration of drives in Classic Style (as predecessor)

Requirement:

PCS 7 V9.0 or higher

Type of delivery:

CD-ROM

Languages:

en, de, fr, it, es

With electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data storage medium)
- Update service for single-user license
- Upgrade from V6.x/V7.x/V8.x/V9.x to V9.0 SPx <sup>1)</sup>

**6SW1700-1JD00-0AA0**

**6SW1700-5JD00-1AC0**

**6SW1700-0JD00-0AB2**

**6SW1700-1JD00-0AA0**

**Drive ES PCS 7 APL V9.0 SPx <sup>1)</sup>**

Block library for PCS 7 for the integration of drives in APL Style (Advanced Process Library)

Requirement:

PCS 7 V9.0 or higher

Type of delivery:

CD-ROM

Languages:

en, de, fr, it, es

With electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data storage medium)
- Update service for single-user license
- Upgrade of APL V8.x, V9.x to V9.0 SPx <sup>1)</sup> or Drive ES PCS 7 V6.x, V7.x, V8.x, V9.x classic to Drive ES PCS 7 APL V9.0 SPx <sup>1)</sup>

**6SW1700-1JD01-0AA0**

**6SW1700-5JD00-1AC0**

**6SW1700-0JD01-0AB2**

**6SW1700-1JD01-0AA0**

<sup>1)</sup> Orders are automatically supplied with the latest Service Pack (SP).

## Software for SIMATIC Controllers

Software for common tasks

For network planning/commissioning

### SINETPLAN 2.0 network planning

#### Overview



SINETPLAN topology view

The SINETPLAN Siemens Network Planner

- supports planners of automation systems based on PROFINET and
- facilitates the professional and proactive simulation of a plant/system network.

#### Licenses

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).

You can find more information on the Software Update Service, license types, online software delivery and handling your software licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

#### Ordering data

#### Article No.

##### Siemens Network Planner SINETPLAN V2.0

Software for simulating PROFINET networks; 3 languages en/de/zh, executable under Windows 7 and Windows 10 (64-bit each)

- Floating license; software and documentation on DVD, license key on USB flash drive
- Floating license; software download incl. license key<sup>1)</sup>  
Email address required for delivery

**6ES7853-0AA01-0YA5**

**6ES7853-0AE01-0YA5**

##### Siemens Network Planner SINETPLAN Upgrade V2.0

Software for simulating PROFINET networks; upgrade from V1.x to V2.0; 3 languages en/de/zh, executable under Windows 7 and Windows 10 (64-bit each)

- Floating license; software and documentation on DVD, license key on USB flash drive
- Floating license; software download incl. license key<sup>1)</sup>  
Email address required for delivery

**6ES7853-0AA01-0YE5**

**6ES7853-0AE01-0YE5**

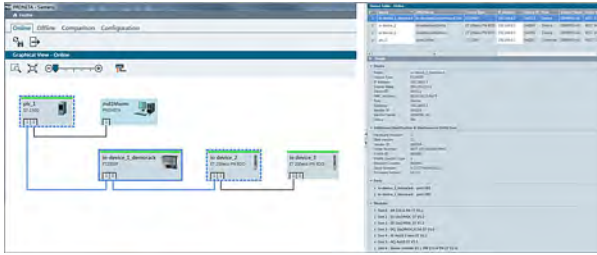
<sup>1)</sup> For up-to-date information and download availability, see: <https://support.industry.siemens.com/cs/ww/en/view/109763136>

#### Technical specifications

SINETPLAN V2.0 can be used on the following operating systems (64-bit each):

- Microsoft Windows 7 Professional SP1
- Microsoft Windows 7 Enterprise SP1
- Microsoft Windows 7 Ultimate SP1
- Microsoft Windows 10 Home Version 1809
- Microsoft Windows 10 Pro Version 1809
- Microsoft Windows 10 Enterprise Version 1809

### Overview



PRONETA Professional

### Asset management and diagnostics with PRONETA Professional

With PRONETA Professional, the network can be scanned automatically at regular intervals and the real plant configuration can thereby be documented transparently. This allows for new opportunities and for better planning of maintenance and servicing which, in turn, optimizes plant operation. This prevents undesired situations, such as a missing, compatible spare part, during maintenance and service. This increases production availability.

In addition, with PROFlenergy diagnostics, device statuses can be recognized or the mode can be changed. The measured values can also be displayed for devices with the PROFlenergy metering function. Furthermore, the data record wizard provides the option of sending PROFINET data records to PROFINET devices via acyclic communication.

#### Licenses

- The software can be installed on one computer (single license).

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<https://www.siemens.com/simatic-licenses>

### Ordering data

#### PRONETA Professional V1.1

Software for asset management with API, PROFlenergy diagnostics, data record wizard; 2 languages en/de, can be run under Windows 7 (32-bit and 64-bit) and Windows 10 (64-bit)

Single license; software, documentation and license for download

Single license upgrade from V1.0 to V1.1; software, documentation and license for download

### Article No.

**6ES7853-2BE01-0YA0**

**6ES7853-2BE01-0YE0**

### Technical specifications

PRONETA Professional V1.1 can be used on the following operating systems:

- Microsoft Windows 7 (32-bit and 64-bit)
  - Microsoft Windows 7 Professional SP1
  - Microsoft Windows 7 Enterprise SP1
  - Microsoft Windows 7 Ultimate SP1
- Microsoft Windows 10 (64-bit):
  - Microsoft Windows 10 Home version 1809
  - Microsoft Windows 10 Pro version 1809
  - Microsoft Windows 10 Enterprise version 1809

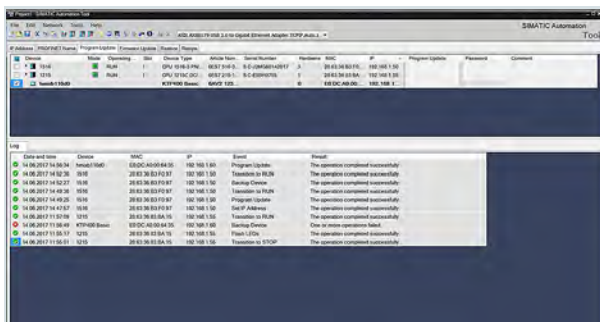
## Software for SIMATIC Controllers

Software for common tasks

For maintenance

### SIMATIC Automation Tool

#### Overview



- To support commissioning and service activities independent of the engineering framework
- For configuration, operation, maintenance and documentation of automation networks
- Rapid overview of the status of the SIMATIC automation system
- Time savings thanks to parallel operations (license required)
- Optimum upgrade support for the devices used and their versions through the display of article numbers, firmware versions and HW versions
- Simple traceability of performed operations and resulting changes in the system through the optional, automatic storage of event log entries in a file
- Automated processes for optimum API-based workflows (license required)

Supported products:

- SIMATIC ET 200
  - ET 200AL IM
  - ET 200AL SM and IO-Link
  - ET 200eco
  - ET 200M IM
  - ET 200MP IM
  - ET 200S IM
  - ET 200pro IM
  - ET 200pro IO-Link and RFID
  - ET 200SP CPU
  - ET 200SP IM and server modules
  - ET 200SP SM, AS-i, CM, CP, TM, IO-Link, motor starters
- SIMATIC S7-1200
  - S7-1200 CPU
  - S7-1200 SM and CM
- SIMATIC S7-1500
  - S7-1500 CPU
  - S7-1500 SM and other modules
- SIMATIC HMI
  - HMI Basic 2nd Generation
  - HMI Comfort
  - HMI Mobile
- SITOP power supplies
- RFID and MOBY
- SCALANCE

#### Licenses

- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The following license types are provided:
  - 21-day trial license (without license key); download as registered customer from <https://support.industry.siemens.com/cs/ww/en/view/98161300>
  - SIMATIC Automation Tool – basic scope of functions
  - SIMATIC Automation Tool Advanced – extended scope of functions, including:
    - Scheduler for planning device operations at a specific time and with selectable frequency
    - Card browser for working with files and folders on SIMATIC Memory Cards in CPUs
    - Extended options for handling SIMATIC Automation Tool projects - Archiving of SAT projects and associated file data
    - Support of devices downstream from a NAT router
    - Possibility to insert multiple devices in one operation
    - Support of CPUs connected via a CM (communications module) or CP (communications processor)
    - Firmware installation in 2 sequences - Option to download the firmware update files to devices and activate the new firmware at a later time.
- SIMATIC Automation Tool Advanced PowerPack V3/V4 upgrade to Advanced V4 - License key upgrade for activating the extended V4 functions based on an available V3/V4 license key.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

<http://www.siemens.com/simatic-licenses>

Ordering data	Article No.	Technical specifications
<p><b>SIMATIC Automation Tool V4.0</b></p> <p>Commissioning and service software for machines and plants; 6 languages: en, de, fr, es, it, zh; executable under Windows 10 (64-bit)</p> <p>Floating license; software download incl. license key<sup>1)2)</sup>; Email address required for delivery</p>	6ES7853-1AE04-0YA5	<p>The SIMATIC Automation Tool can be used on the following operating systems (64-bit only):</p> <ul style="list-style-type: none"> <li>• Windows 7 Home Premium SP1 (only V3.1)</li> <li>• Windows 7 Professional SP1 (only V3.1)</li> <li>• Windows 7 Enterprise SP1 (only V3.1)</li> <li>• Windows 7 Ultimate SP1 (only V3.1)</li> <li>• Windows 10 Home</li> <li>• Windows 10 Pro</li> <li>• Windows 10 Enterprise</li> <li>• Windows 10 IoT Enterprise</li> </ul>
<p><b>SIMATIC Automation Tool V4.0 Advanced</b></p> <p>Commissioning and service software for machines and plants with extended scope of functions (e.g. scheduler, support for devices downstream from a NAT router, archiving function for SAT projects and associated file data); 6 languages: en, de, fr, es, it, zh; executable under Windows 10 (64-bit)</p> <p>Floating license; software download incl. license key<sup>1)</sup>; Email address required for delivery</p>	6ES7853-1AE14-0YA5	
<p><b>PowerPack SIMATIC Automation Tool V3/V4 to SIMATIC Automation Tool Advanced V4</b></p> <p>Upgrade for activating the extended V4 functions based on an available V3/V4 license key</p> <p>Floating license; software download incl. license key<sup>1)</sup>; Email address required for delivery</p>	6ES7853-1KE04-0YA5	
<p><b>SIMATIC Automation Tool SDK V4.0</b></p> <p>API software and documentation for creating customer applications for commissioning and servicing machines and plants; 6 languages: en, de, fr, es, it, zh; executable under Windows 7 and Windows 10 (64-bit)</p> <p>Software download<sup>1)</sup>; Email address required for delivery</p>	6ES7853-1AE03-0AG8	

<sup>1)</sup> For up-to-date information and download availability, see: <https://support.industry.siemens.com/cs/ww/en/view/98161300>

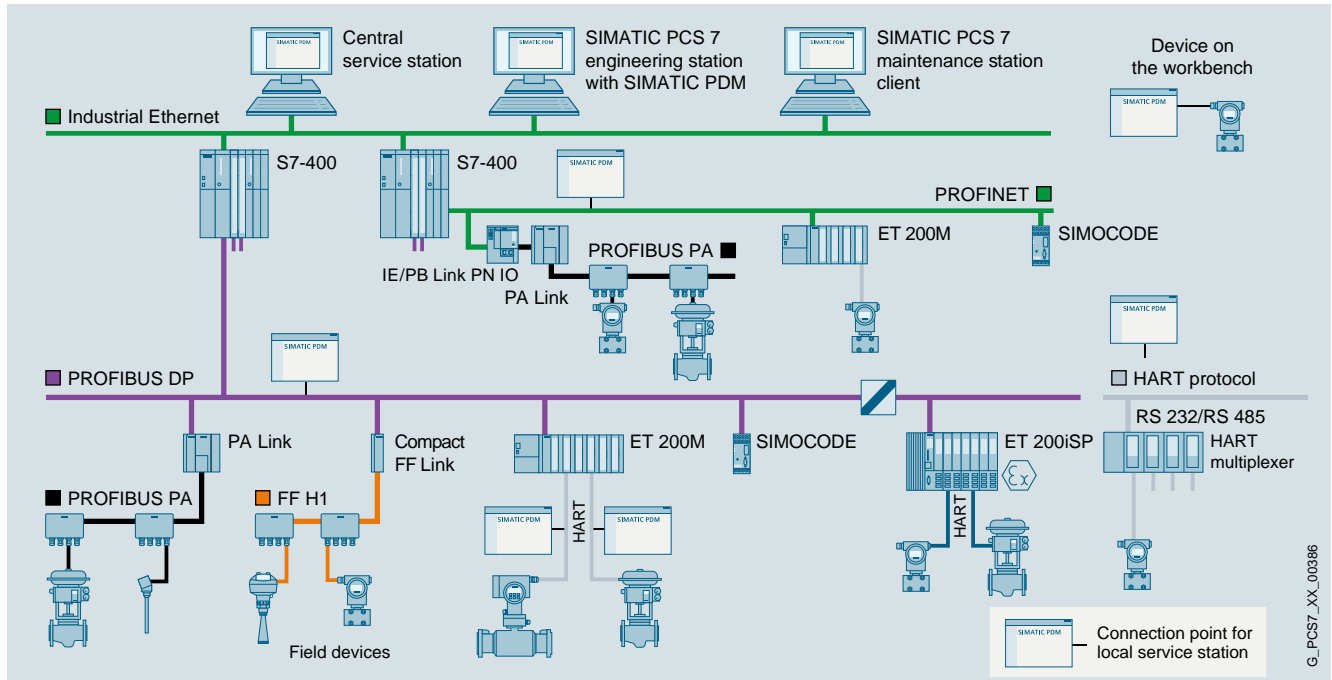
<sup>2)</sup> V3 license keys can also be used for V4, except for the Advanced functions.

## Software for SIMATIC Controllers

Software for common tasks  
For maintenance

### SIMATIC PDM

#### Overview



Configuration options with SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, vendor-independent tool for the configuration, parameter assignment, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control-room devices, compact controllers), which in the following sections will be referred to simply as devices.

With *one* software product, SIMATIC PDM enables users to work with over 4 000 devices and device variants from Siemens and over 200 other manufacturers worldwide on a *single* homogeneous user interface.

The user interface satisfies the requirements of the VDI/VDE GMA 2187 and IEC 65/349/CD directives. Parameters and functions for all supported devices are displayed in a consistent and uniform fashion independent of their communications interface. Even complex devices with several hundred parameters can be represented clearly and processed quickly. Using SIMATIC PDM it is very easy to navigate in highly complex stations such as remote I/Os and even connected field devices.

From the viewpoint of device integration, SIMATIC PDM is the most powerful open process device manager on the global market. Devices not previously supported can be integrated in SIMATIC PDM by importing their device description packages (either EDD or FDI). This provides security for your investment and saves you investment costs, training expenses and follow-up costs.

SIMATIC PDM supports the operative system management in particular through:

- Uniform representation and operation of devices
- Uniform representation of diagnostics information
- Indicators for preventive maintenance and servicing
- Detection of changes in the project and device
- Increasing the operational reliability
- Reducing the investment, operating and maintenance costs
- Quantity options for
  - Transfer of parameters between devices
  - Transfer of parameter sets to the devices
  - Export and import functions
  - Diagnostics update

SIMATIC PDM can be used extremely flexibly and tailored to a specific task for field device service:

- Single-point station for point-to-point connection to field devices
- Local service and parameter assignment station with connection to fieldbus segments
- Central service and parameter assignment station with connection to plant bus
- Central HART service and parameter assignment station for HART multiplexers and WirelessHART field devices
- Integrated into the stand-alone SIMATIC PDM Maintenance Station
- Integrated into the SIMATIC PCS 7 process control system

G\_PCS7\_XX\_00386



## Overview

Maintenance personnel can assign field device parameters at mobile and stationary workstations with SIMATIC PDM. Practically every workstation integrated in the production plant can be used for configuration. Service personnel are thus able to work directly at the location of the field device, while data is stored centrally in the engineering station or maintenance station. This leads to a significant shortening of maintenance and travel times. Additional device-independent system functions support higher-level maintenance stations for creating progress lists for work and servicing.

When a maintenance station is configured in the SIMATIC PCS 7 process control system, SIMATIC PDM is integrated into it and transmits parameter data, diagnostic information and processing information. You can switch directly to the SIMATIC PDM views from the diagnostics faceplates in the maintenance station to perform diagnostics and work on the device in more detail.

A SIMATIC PDM user administration system based on SIMATIC Logon is used to assign various roles with defined function privileges to users. These function privileges refer to SIMATIC PDM system functions, e.g. writing to the device.

For all devices integrated with device description packages, SIMATIC PDM provides a range of information for display and further processing on the maintenance station, for example:

- Device type information (electronic rating plate)
- Detailed diagnostics information (manufacturer information, information on error diagnostics and troubleshooting, further documentation)
- Results of internal condition monitoring functions
- Status information (for example local configuration changes, device test completed)
- Information on changes (Audit Trail report)
- Parameter information

## Ordering data

### Article No.

#### SIMATIC PDM Stand alone product packages

##### Minimum configuration

##### SIMATIC PDM Single Point V9.2

including 1 TAG; product package for operation and configuration of one field device; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET

Additional functions or SIMATIC PDM TAGs are not possible

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user

Without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundle with 1 x SIMATIC PDM Software Media Package per order item
- Online delivery  
License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)  
Note: Email address required!

**6ES7658-3HA78-0YA5**

**6ES7658-3HA78-0YH5**

### Article No.

#### Basic configuration for individual product packages

##### SIMATIC PDM Basic V9.2

including 4 TAGs; product package for operation and configuration of field devices and components; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user

Without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundle with 1 x SIMATIC PDM Software Media Package per order item
- Online delivery  
License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)  
Note: Email address required!

**6ES7658-3AB78-0YA5**

**6ES7658-3AB78-0YH5**

# Software for SIMATIC Controllers

Software for common tasks

For maintenance

## SIMATIC PDM

### Ordering data

### Article No.

### Article No.

#### Configuration for a local service and parameter assignment station

##### **SIMATIC PDM Service V9.2**

Product package for service and measuring circuit tests on a local service station, with

- SIMATIC PDM Basic incl. 4 TAGs
- 50 TAGs

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user

Without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item
- Online delivery  
License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)  
Note: Email address required!

6ES7658-3JD78-0YA5

6ES7658-3JD78-0YH5

#### Configuration for a central service and parameter assignment station

##### **SIMATIC PDM Stand-alone Server V9.2**

Product package for service and device management in plant units, with

- SIMATIC PDM Basic incl. 4 TAGs
- SIMATIC PDM Extended
- SIMATIC PDM Server
- 2 × SIMATIC PDM 1 Client
- 100 TAGs

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), single license for 1 installation

Without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item
- Online delivery  
License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)  
Note: Email address required!

6ES7658-3TX78-0YA5

6ES7658-3TX78-0YH5

#### SIMATIC PDM system-integrated product packages

#### Configuration for integration in SIMATIC S7 configuration environment

##### **SIMATIC PDM S7 V9.2**

Product package for use in a SIMATIC S7 configuration environment, with

- SIMATIC PDM Basic incl. 4 TAGs
- SIMATIC PDM Extended
- SIMATIC PDM Integration in STEP 7/PCS 7
- 100 TAGs

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user

Without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item
- Online delivery  
License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)  
Note: Email address required!

6ES7658-3KD78-0YA5

6ES7658-3KD78-0YH5

#### Configuration for integration in SIMATIC PCS 7 configuration environment

##### **SIMATIC PDM PCS 7 V9.2**

Product package for use in a SIMATIC PCS 7 configuration environment

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information)

Floating license for 1 user, with

- SIMATIC PDM Basic incl. 4 TAGs
- SIMATIC PDM Extended
- SIMATIC PDM Integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- 100 TAGs

Without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item
- Online delivery  
License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)  
Note: Email address required!

6ES7658-3LD78-0YA5

6ES7658-3LD78-0YH5

Ordering data	Article No.	Article No.
<p><b>SIMATIC PDM PCS 7-FF V9.2</b> Product package for use in a SIMATIC PCS 7 configuration environment, including FOUNDATION Fieldbus H1 communication</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information)</p> <p>Floating license for 1 user, with</p> <ul style="list-style-type: none"> <li>- SIMATIC PDM Basic incl. 4 TAGs</li> <li>- SIMATIC PDM Extended</li> <li>- SIMATIC PDM Integration in STEP 7/PCS 7</li> <li>- SIMATIC PDM Routing</li> <li>- SIMATIC PDM Communication FOUNDATION Fieldbus</li> <li>- 100 TAGs</li> </ul> <p>Without SIMATIC PCS 7 Software Media Package</p> <ul style="list-style-type: none"> <li>• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 x SIMATIC PDM Software Media Package per order item</li> <li>• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) <u>Note:</u> Email address required!</li> </ul>	<p><b>6ES7658-3MD78-0YA5</b></p> <p><b>6ES7658-3MD78-0YH5</b></p>	<p><b>Optional product components for SIMATIC PDM</b></p> <p><b>SIMATIC PDM Extended V9.2</b> For enabling additional system functions</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user</p> <p>Without SIMATIC PCS 7/SIMATIC PDM Software Media Package</p> <ul style="list-style-type: none"> <li>• Goods delivery License key on USB flash drive and Certificate of License</li> <li>• Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online Certificate of License <u>Note:</u> Email address required!</li> </ul>
<p><b>SIMATIC PDM PCS 7 Server V9.2</b> Product package for use in a SIMATIC PCS 7 configuration environment, including server functionality</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information)</p> <p>Single license for 1 installation, with</p> <ul style="list-style-type: none"> <li>- SIMATIC PDM Basic incl. 4 TAGs</li> <li>- SIMATIC PDM Extended</li> <li>- SIMATIC PDM Integration in STEP 7/PCS 7</li> <li>- SIMATIC PDM Routing</li> <li>- SIMATIC PDM Server</li> <li>- 100 TAGs</li> </ul> <p>Without SIMATIC PCS 7 Software Media Package</p> <ul style="list-style-type: none"> <li>• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 x SIMATIC PDM Software Media Package per order item</li> <li>• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) <u>Note:</u> Email address required!</li> </ul>	<p><b>6ES7658-3TD78-0YA5</b></p> <p><b>6ES7658-3TD78-0YH5</b></p>	<p><b>SIMATIC PDM Integration in STEP 7/SIMATIC PCS 7 V9.2</b> For integration in a SIMATIC S7/SIMATIC PCS 7 configuration environment</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user</p> <p>Without SIMATIC PCS 7/SIMATIC PDM Software Media Package</p> <ul style="list-style-type: none"> <li>• Goods delivery License key on USB flash drive and Certificate of License</li> <li>• Online delivery License key download and online Certificate of License <u>Note:</u> Email address required!</li> </ul> <p><b>SIMATIC PDM Routing V9.2</b> For plant-wide navigation to field devices</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user</p> <p>Without SIMATIC PCS 7/SIMATIC PDM Software Media Package</p> <ul style="list-style-type: none"> <li>• Goods delivery License key on USB flash drive and Certificate of License</li> <li>• Online delivery License key download, online Certificate of License <u>Note:</u> Email address required!</li> </ul>

# Software for SIMATIC Controllers

Software for common tasks

For maintenance

## SIMATIC PDM

### Ordering data

#### SIMATIC PDM Server V9.2

For activating the server functionality

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), single license for 1 installation

Without SIMATIC PCS 7/SIMATIC PDM Software Media Package

- Goods delivery  
License key on USB flash drive, Certificate of License
- Online delivery  
License key download and online Certificate of License  
Note: Email address required!

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6ES7658-3TX78-2YH5

#### SIMATIC PDM Communication FOUNDATION Fieldbus V9.2

For communication with field devices on FOUNDATION Fieldbus H1

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user

Without SIMATIC PCS 7/SIMATIC PDM Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License
- Online delivery  
License key download and online Certificate of License  
Note: Email address required!

6ES7658-3QX78-2YB5

6ES7658-3QX78-2YH5

#### SIMATIC PDM HART Server V9.2

For using HART multiplexers as well as for configuration of WirelessHART field devices

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user

Without SIMATIC PCS 7/SIMATIC PDM Software Media Package

- Goods delivery  
License key on USB flash drive and Certificate of License
- Online delivery  
License key download and online Certificate of License  
Note: Email address required!

6ES7658-3EX78-2YB5

6ES7658-3EX78-2YH5

#### SIMATIC PDM Command Interface V9.2

Use of remote control of SIMATIC PDM with  
1 x SIMATIC PDM  
1 Client

Note: Special conditions of purchase and supply

- Goods delivery  
(without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
License key on USB flash drive and Certificate of License

6ES7658-3SX78-2YB5

#### SIMATIC PDM 1 Client

Cumulative client license for SIMATIC PDM configurations with SIMATIC PDM Server, software class A, single license for 1 installation

- Goods delivery  
License key on USB flash drive and Certificate of License
- Online delivery  
License key download and online Certificate of License  
Note: Email address required!

6ES7658-3UA00-2YB5

6ES7658-3UA00-2YH5

#### SIMATIC PDM TAGs

TAG licenses for expanding the available TAG volume, cumulative, software class A, floating license for 1 user

- Goods delivery  
License key on USB flash drive and Certificate of License
  - 10 TAGs
  - 100 TAGs
  - 1 000 TAGs
- Online delivery  
License key download and online Certificate of License  
Note: Email address required!
  - 10 TAGs
  - 100 TAGs
  - 1 000 TAGs

6ES7658-3XC00-2YB5

6ES7658-3XD00-2YB5

6ES7658-3XE00-2YB5

6ES7658-3XC00-2YH5

6ES7658-3XD00-2YH5

6ES7658-3XE00-2YH5

#### SIMATIC PDM Software Media Package

#### SIMATIC PDM Software Media Package V9.2

Installation software without license, 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information)

Without SIMATIC PCS 7 Software Media Package

Note:

Can only be used in conjunction with a valid license or in demo mode!

- Goods delivery  
SIMATIC PDM and device library software on DVD
- Online delivery  
SIMATIC PDM and device library software download  
Note: Email address required!

6ES7658-3GX78-0YT8

6ES7658-3GX78-0YG8

**Technical specifications****SIMATIC PDM V9.2**

Hardware	<ul style="list-style-type: none"><li>• PG/PC/notebook with processor corresponding to operating system requirements</li></ul>
Operating system (alternatives)	<ul style="list-style-type: none"><li>• Windows 10 Professional</li><li>• Windows 10 Enterprise 2019 LTSC</li><li>• When integrated, specifications for SIMATIC PCS 7 take precedence</li></ul>
Integration in STEP 7/PCS 7	<ul style="list-style-type: none"><li>• SIMATIC PCS 7 V8.1/V8.2 (without Communication FOUNDATION Fieldbus)</li><li>• SIMATIC PCS 7 V9.x</li></ul>
SIMATIC PDM Client	<ul style="list-style-type: none"><li>• Microsoft Internet Explorer 10 or 11</li><li>• Google Chrome</li></ul>

## Software for SIMATIC Controllers

Software for common tasks  
For administration

### Central user management (UMC)

#### Overview

The User Management Component (UMC) provides the possibility of central user management. Through the connection to the TIA Portal, users and user groups can be defined and managed across projects. Connection to a Microsoft Active Directory is also possible.

#### Licensing

- Central user management (UMC) is supplied with the TIA Portal.
- The license model depends on the number of user accounts per UMC domain.
- Up to ten user accounts can be used without a license.
- For additional user accounts, 365-day rental licenses are available to accumulate the required number of centrally managed users.

#### Ordering data

##### Central user management (UMC)

Software component to implement central user management, included in the scope of supply of the respective products (e.g. TIA Portal).

The license model depends on the number of user accounts per UMC domain. Use of max. 10 user accounts possible without a license.

6 languages: en, de, fr, es, it, zh; executable under Windows 7 (64-bit), Windows 10 (64-bit), Windows Server 2012R2 (64-bit), Windows Server 2016/2019 (64-bit)

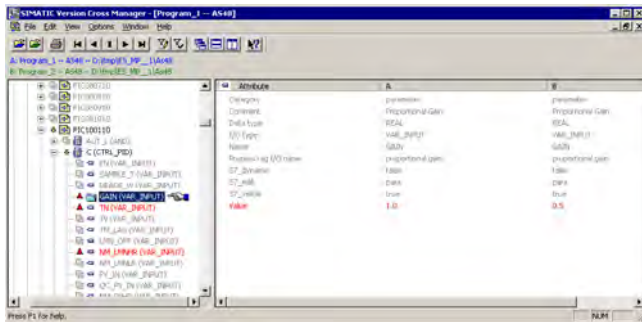
- Rental license 365 days with license certificate for 100 user accounts
- Rental license 365 days with license certificate for 4 000 user accounts

#### Article No.

**6ES7823-1UE30-0YA0**

**6ES7823-1UE10-0YA0**

## Overview



The SIMATIC Version Cross Manager is a user-friendly tool for determining the differences between various versions of individual projects or multi-projects by:

- Tracing missing, additional or differing objects by comparing hardware configuration, communication, plant hierarchy, CFC/SFC plans, SFC details, block types, messages, global tags, signals and run sequences
- Graphic display of comparison results in a combination of tree and tabular formats
- Clear hierarchical structuring according to the technological hierarchy of the plant
- Color-coded identification of the differences

Note:

As the function "Control module adjustment" is based on a basic functionality of the Version Cross Manager (VXM), you need a VXM license to use this function. In the absence of a license, a message appears telling you to install Version Cross Manager. This is not actually necessary, all you need to install is a valid VXM license that will enable the relevant functionality on the engineering station.

## Ordering data

## Article No.

**SIMATIC Version Cross Manager V9.0**

6 languages (English, German, French, Italian, Spanish, Chinese), software class A

Runs with the following operating systems (see VXM Readme in the Siemens Industry Online Support for latest information)

- Windows 7 Ultimate 64-bit
- Windows 10 Enterprise 2015 LTSC 64-bit
- Windows Server 2012 R2 Standard Edition 64-bit
- Windows Server 2016 Standard Edition 64-bit

Floating license for 1 user, without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive and certificate of license and TIA Engineering Toolset CD
- Online delivery  
License key download, online Certificate of License and TIA Engineering Toolset (software download)  
Note:  
Email address required!

6ES7658-1CX58-2YA5

6ES7658-1CX58-2YH5

**Upgrade package (only for TIA applications)****SIMATIC Version Cross Manager upgrade from V7.1/V8.2 to V9.0**

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, for operating systems see above

Floating license for 1 user, without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive, certificate of license and TIA Engineering Toolset CD
- Online delivery  
License key download, online Certificate of License and TIA Engineering Toolset (software download)  
Note:  
Email address required!

6ES7658-1CX58-2YE5

6ES7658-1CX58-2YK5

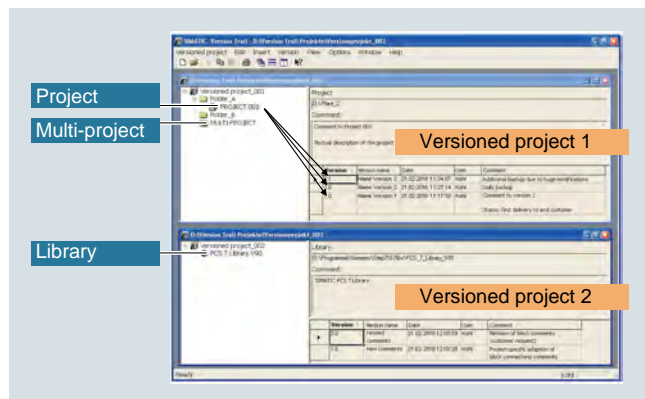
## Software for SIMATIC Controllers

Software for common tasks

For administration

### Version Trail

#### Overview



SIMATIC Version Trail is a software option for engineering which, together with the SIMATIC Logon central user administration, can assign a version history to libraries, projects and multi-projects.

#### Ordering data

#### Article No.

##### SIMATIC Version Trail V9.0

6 languages (English, German, French, Italian, Spanish, Chinese), software class A

Runs with the following operating systems (see VT Readme in the Siemens Industry Online Support for latest information)

- Windows 7 Ultimate 64-bit
- Windows 10 Enterprise 2015 LTSC 64-bit
- Windows Server 2012 R2 Standard Edition 64-bit
- Windows Server 2016 Standard Edition 64-bit

Floating license for 1 user, without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive, certificate of license and TIA Engineering Toolset CD
- Online delivery  
License key download, online certificate of license and TIA Engineering Toolset (software download)  
Note:  
Email address required!

**6ES7658-1FX58-2YA5**

**6ES7658-1FX58-2YH5**

##### Upgrade package (only for TIA applications)

##### SIMATIC Version Trail upgrade from V8.x to V9.0

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, for operating systems see above

Floating license for 1 user, without SIMATIC PCS 7 Software Media Package

- Goods delivery  
License key on USB flash drive, certificate of license
- Online delivery  
License key download, online certificate of license and TIA Engineering Toolset (software download)  
Note:  
Email address required!

**6ES7658-1FX58-2YE5**

**6ES7658-1FX58-2YK5**



## SIMATIC Programming devices



### 13/2

#### Programming devices

13/2

Field PG M6

13/7

Accessories

13/7

External prommer

13/8

Communications software

13/8

SOFTNET for PROFIBUS

13/10

SOFTNET for Industrial Ethernet

# SIMATIC programming devices

## Programming devices

### Field PG M6

#### Overview



- The mobile, industry-standard programming device for automation engineers with a powerful, eighth-generation Intel® Core™ i processor (Coffee Lake) and high-speed RAM (DDR4 RAM)
- Elegant, robust enclosure made of light-weight stable injection-molded magnesium with rubber-protected corners and retractable carry-handle
- Can optimally be used both for engineering in the office and for the commissioning, service or maintenance of automation systems
- Industrial notebook with all commonly used interfaces for industrial applications
- Can be used immediately thanks to pre-installed SIMATIC engineering software

#### Ordering data

#### Article No.

##### Field PG M6 Comfort programming device

Intel i5-8400H processor (8 MB Smart Cache, 2.5 to 4.2 GHz, 4 cores + Hyper-Threading), 15.6" display, full HD (1920x1280), DVD+-RW drive, UHD graphics 630, WLAN 802.11ac, Bluetooth v5.0; without SIMATIC S5 interface, without SIMATIC S5 EPROMMER

##### RAM

- 1 x 8 GB DDR4 SDRAM SO-DIMM
- 1 x 16 GB DDR4 SDRAM SO-DIMM
- 1 x 32 GB DDR4 SDRAM SO-DIMM
- 2 x 32 GB DDR4 SDRAM SO-DIMM

##### Hard disk

- 256 GB SSD SATA (2.5")
- 512 GB SSD SATA (2.5")
- 2 TB SSD SATA (2.5")

##### Keyboard and power cable (essential)

- Keyboard: QWERTY (& German); power supply cable: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland
- Keyboard: AZERTY (France); power supply cable: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland
- Keyboard: QWERTY (& German); power supply cable: Italy
- Keyboard: QWERTY (& German); power supply cable: Switzerland
- Keyboard: QWERTY (& German); power supply cable: USA
- Keyboard: QWERTY (& German); power supply cable: United Kingdom
- Keyboard: QWERTY (& German); power supply cable: China; approval for China (CCC)
- Keyboard: QWERTY (& German); without power supply cable
- Keyboard: QWERTY (& German); power supply cable: India

##### M.2 NVME hard drive

- Without M.2 hard drive
- 512 GB SSD NVME (M.2)
- 1 TB SSD NVME M.2

##### Operating system

- Windows 10 Enterprise, 64-bit
- Windows 10 Enterprise LTSC 2019, 64-bit
- Without operating system

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A  
B  
C  
D

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B  
C

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#### Article No.

##### Field PG M6 Comfort programming device

SIMATIC software licenses

- Trial license:  
STEP 7 Professional Combo (STEP 7 Prof. V16 and STEP 7 Prof. 2017 SR1), WinCC Advanced Combo (WinCC V16 and WinCC flexible 2008 SP5), Safety Advanced Combo (Safety Adv. V16 and Distributed Safety V5.4 SP5)

- License:  
STEP 7 & WinCC & Safety in the TIA Portal:  
STEP 7 Prof. V16, WinCC Adv. V16, Safety Advanced V16

- License:  
STEP 7 & WinCC & Safety Combo:  
STEP 7 Professional Combo (STEP 7 Prof. V16 and STEP 7 Prof. 2017 SR1), WinCC Advanced Combo (WinCC V16 and WinCC flexible 2008 SP5), Safety Advanced Combo (Safety Adv. V16 and Distributed Safety V5.4 SP5)

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A

B

C

Ordering data	Article No.	Article No.	
<b>Field PG M6 Advanced programming device</b> Intel i7-8850H processor (9 MB Smart Cache, 2.6 to 4.3 GHz, 6 cores + Hyper-Threading), 15.6" display, full HD (1920x1280), DVD+-RW drive, UHD graphics 630, WLAN 802.11ac, Bluetooth v5.0 RAM • 1 x 8 GB DDR4 SDRAM SO-DIMM • 1 x 16 GB DDR4 SDRAM SO-DIMM • 1 x 32 GB DDR4 SDRAM SO-DIMM • 2 x 32 GB DDR4 SDRAM SO-DIMM Hard disk • 256 GB HDD SATA • 512 GB SSD SATA • 2 TB SSD SATA SIMATIC S5 interface • Without S5 interface, without S5 EPROMMER • With S5 interface, with S5 EPROMMER; incl. STEP 5 license, S5 PLC cable and EPROM adapter Keyboard and power cable (essential) • Keyboard: QWERTY (& German); power supply cable: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland • Keyboard: AZERTY (France); power supply cable: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland • Keyboard: QWERTY (& German); power supply cable: Italy • Keyboard: QWERTY (& German); power supply cable: Switzerland • Keyboard: QWERTY (& German); power supply cable: USA • Keyboard: QWERTY (& German); power supply cable: United Kingdom • Keyboard: QWERTY (& German); power supply cable: China; approval for China (CCC) • Keyboard: QWERTY (& German); without power supply cable • Keyboard: QWERTY (& German); power supply cable: India	6ES7718- 1 - 1 A B C D A B C 0 1 0 1 2 3 4 5 6 7 8	<b>Field PG M6 Advanced programming device</b> M.2 NVME hard drive • Without M.2 hard drive • 512 GB SSD NVME (M.2) • 1 TB SSD NVME M.2 Operating system • Windows 10 Enterprise, 64-bit • Windows 10 Enterprise LTSC 2019, 64-bit • Without operating system SIMATIC software licenses • Trial license: STEP 7 Professional Combo (STEP 7 Prof. V16 and STEP 7 Prof. 2017 SR1), WinCC Advanced Combo (WinCC V16 and WinCC flexible 2008 SP5), Safety Advanced Combo (Safety Adv. V16 and Distributed Safety V5.4 SP5) • License: STEP 7 & WinCC & Safety in the TIA Portal: STEP 7 Prof. V16, WinCC Adv. V16, Safety Advanced V16 • License: STEP 7 & WinCC & Safety Combo: STEP 7 Professional Combo (STEP 7 Prof. V16 and STEP 7 Prof. 2017 SR1), WinCC Advanced Combo (WinCC V16 and WinCC flexible 2008 SP5), Safety Advanced Combo (Safety Adv. V16 and Distributed Safety V5.4 SP5)	6ES7718- 1 - 1 0 1 2 A B N A B C

# SIMATIC programming devices

## Programming devices

### Field PG M6

Ordering data	Article No.	Article No.
<b>Accessories</b>		<b>Rucksack for Field PG M4/M5/M6</b> 6ES7798-0DA02-0XA0
<b>Memory expansion</b>		<b>SIMATIC IPC Image &amp; Partition Creator V3.5</b> 6ES7648-6AA13-5YA0
8 GB RAM	6ES7648-3AK00-0PA0	Software tool for very easy preventive data backup and efficient partition management on SIMATIC IPCs
16 GB RAM	6ES7648-3AK10-0PA0	
32 GB RAM	6ES7648-3AK20-0PA0	
<b>AC/DC external power supply unit</b>	6ES7798-0GA05-0XA0	<b>SIMATIC IPC Remote Manager V1.3</b> 6ES7648-6EA01-3YA0
For Field PG M6 only; spare part, included in the scope of supply of the Field PG M6		Software tool for efficient remote maintenance and management of a SIMATIC IPC
<b>Power cable (length 3 m)</b>		<b>Software Update Service (Standard Edition)<sup>2)</sup></b>
For Field PG M2/M4/M5/M6 only		The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)
For Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland	6ES7900-5AA00-0XA0	• STEP 7 Professional V1x 6ES7822-1AA00-0YL5
For Great Britain	6ES7900-5BA00-0XA0	• STEP 7 Professional Combo (STEP 7 Prof. V1x (TIA Portal) and STEP 7 Prof.) 6ES7810-5CC04-0YE2
For Switzerland	6ES7900-5CA00-0XA0	• SIMATIC WinCC Advanced 6AV6613-0AA00-0AL0
For USA	6ES7900-5DA00-0XA0	• SIMATIC STEP 7 Safety Advanced 6ES7833-1FC00-0YX2
For Italy	6ES7900-5EA00-0XA0	
For China	6ES7900-5FA00-0XA0	
For India	6ES7900-5GA00-0XA0	
<b>Spare battery (lithium ion, 8.25 Ah)<sup>1)</sup></b>	6ES7798-0AA10-0XA0	<b>Software Update Service (download)<sup>2)</sup></b>
For Field PG M6 only; spare part, included in the scope of supply of the Field PG M6		The upgrades and Service Packs are available for downloading. Email address required for delivery
<b>MPI cable</b>	6ES7901-0BF00-0AA0	• STEP 7 Professional V1x 6ES7822-1AE00-0YY0
For connecting a PG and SIMATIC S7 via MPI; 5 m		• STEP 7 Professional Combo (STEP 7 Prof. V1x (TIA Portal) and STEP 7 Prof.) 6ES7810-5CC04-0YY2
<b>S5 EPROM programming adapter</b>	6ES7798-0CA00-0XA0	• SIMATIC WinCC Advanced 6AV6613-0AA00-0AY0
For SIMATIC S5 EPROM programming using the Field PG		• SIMATIC STEP 7 Safety Advanced 6ES7833-1FC00-0YY0
<b>Replaceable SSD kit</b>		
Replaceable SSD 512 GB serial ATA; with protective pocket and torx screwdriver; for Field PG M5/M6	6ES7791-2BA22-0AA0	
Replaceable SSD 2 TB serial ATA; with protective pocket and torx screwdriver; for Field PG M6	6ES7791-2BA25-0AA0	
<b>Adapter serial ATA to USB 3.0</b>	6ES7790-1AA01-0AA0	
For using the removable hard disk in the hard disk kit as an external hard disk (only for Field PG M4/M5/M6)		

<sup>1)</sup> The capacity of the battery decreases for technological reasons with each charging/discharging cycle and also as a result of being stored at excessively high or low temperatures. The running time per charge decreases therefore over the course of time. With normal use, the battery can be charged and discharged over a period of six months from when the Field PG is purchased. Loss of capacity is not covered by the warranty. For the battery's operation we grant a warranty of six months. We recommend replacing the battery with an original Siemens battery at the end of these six months if there is a significant drop in performance.

<sup>2)</sup> For more information on the Software Update Service, see Catalog section 12, page 12/2.

### Technical specifications

Article number	<b>6ES7718-.....-....</b> SIMATIC Field PG M6
<b>General information</b>	
Design of the programming device	Notebook
<b>Display</b>	
Design of display	15.6" full HD display in 16:9 format
<b>Resolution (pixels)</b>	
• Horizontal image resolution	1 920 pixel
• Vertical image resolution	1 080 pixel
<b>General features</b>	
• Non-reflecting	Yes
• Luminance	300 cd/m <sup>2</sup>
<b>Backlighting</b>	
• Type of backlighting	LED
<b>Control elements</b>	
<b>Keyboard fonts</b>	
• Design	QWERTZ/QWERTY or AZERTY (French); 87 keys
<b>Touch operation</b>	
• Integrated touch pad	Yes; Clickpad
<b>Supply voltage</b>	
Design of the power supply	External wide-range power supply; 3-pole
<b>Line frequency</b>	
• permissible range, lower limit	47 Hz
• permissible range, upper limit	63 Hz
<b>Processor</b>	
Processor type	Intel Core i5-8400H (2.5 to 4.2 GHz, 4 cores and hyper-threading, 8 MB Smart Cache) or i7-8850H (2.6 to 4.3 GHz 6 cores and hyper-threading, 9 MB Smart Cache)
Chipset	Intel CM246
Hyper-threading	Yes
Turbo Boost Technology 2.0	Yes
<b>Graphic</b>	
Graphics controller	Intel® UHD Graphics 630
<b>Drives</b>	
DVD-RW	Yes
SSD	Yes; Easy to replace
• Memory capacity	256 Gbyte; Up to 2 TB SSD
TPM Security Chip	Yes; 2.0 (version for China without TPM)
<b>Memory</b>	
Type of memory	DDR4 SO-DIMM
<b>Work memory</b>	
• Number of slots	2
<b>Accumulator</b>	
Replaceable	Yes; Lithium-ion battery
Capacity	8.25 A-h

Article number	<b>6ES7718-.....-....</b> SIMATIC Field PG M6
<b>Interfaces</b>	
Number of interfaces PROFIBUS DP	1; 1x PROFIBUS DP / MPI; 9-pin Sub-D socket; 9.6 kBaud to 12 Mbaud
Number of RS 232 interfaces	1; 25-pin socket
Number of USB interfaces	4
• Type A	3; 1x USB port incl. integrated charging function for USB devices (e.g. smartphone) - also with device switched off
• Type C	1; USB 3.1 Gen. 2
Number of chip-card readers	1; Smart Card Reader (ISO/IEC 7816)
Bluetooth radio standard	Yes; V5.0
Multimedia card/SD card slot	2 in 1 (SDHC UHS-II, MMC)
Card reader for SIMATIC memory cards	SIMATIC memory cards (for S7-300/400), SMC (for S7-1x00), SIMATIC micro memory card (for S7-300/C7/ET 200) - including programming interfaces
Universal Audio Jack	Yes; Audio socket for 3.5 mm jack
<b>Video interfaces</b>	
• analog video signal (VGA)	Yes; via adapter from DVI to VGA
• DVI-I	Yes; 1x
• DisplayPort	Yes; 1x
<b>Industrial Ethernet</b>	
• Industrial Ethernet interface	2x Ethernet (RJ45)
- 100 Mbps	Yes
- 1000 Mbps	Yes; Gigabit Ethernet; 2x RJ45 with 2 independent MAC/IP addresses
• Wake on LAN	Yes
• IAMT (Intel Active Management Technology)	Yes
<b>WLAN</b>	
• Type	802.11ac
<b>Interrupts/diagnostics/status information</b>	
LED status display	Battery status, device status, access to HDD/DVD, access to SD/MMC, MPI/DP, S5 and S7 modules / Card Reader (except Smart Card Reader), Num Lock, Caps Lock, WLAN active
<b>EMC</b>	
<b>Interference immunity against discharge of static electricity</b>	
• Interference immunity against discharge of static electricity acc. to IEC 61000-4-2	Yes; ±4 kV contact discharge acc. to IEC 61000-4-2, ESD; ±8 kV air discharge acc. to IEC 61000-4-2, ESD
<b>Interference immunity to cable-borne interference</b>	
• Interference immunity on supply cables	±2 kV (according to IEC 61000-4-4, burst); ±1 kV (according to IEC 61000-4-5, surge pulse/line to line); ±2 kV (according to IEC 61000-4-5, surge pulse/line to ground)
• Interference immunity on signal cables	±1 kV (according to IEC 61000-4-4, burst, length < 30 m); ±2 kV (according to IEC 61000-4-4, burst, length > 30 m); ±2 kV (according to IEC 61000-4-5, surge sym./line to ground, length > 30 m)

# SIMATIC programming devices

## Programming devices

### Field PG M6

#### Technical specifications

Article number	<b>6ES7718-.....-....</b> SIMATIC Field PG M6
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
DIN/ISO 9001	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	5 °C; Max. 10 °C/h (no condensation)
• max.	40 °C; Max. 10 °C/h (no condensation)
<b>Operating systems</b>	
Local language of operating system	Multi-Language User Interface (MUI): 6 languages (English, German, French, Spanish, Italian, Chinese)
<b>pre-installed operating system</b>	
• Windows 10	Yes; Windows 10 Enterprise 64-bit
<b>Software</b>	
<b>Preinstalled</b>	
• STEP 7 Professional (TIA Portal)	Yes
• STEP 7	Yes
• WinCC flexible Advanced 2008	Yes; Software version: SP5
• WinCC Advanced (TIA Portal)	Yes; software version: V16
• STEP 5	Yes; Optional; software version: STEP 5 V7.23 HF2 (incl. GRAPH 5/II V7.15)
<b>Mechanics/material</b>	
Material of housing	metal
Handle	Yes; retractable
Socket for Kensington lock	Yes
rubber corner guards	Yes

Article number	<b>6ES7718-.....-....</b> SIMATIC Field PG M6
<b>Dimensions</b>	
Width	385 mm
Height	53 mm
Depth	275 mm
<b>Weights</b>	
Weight, approx.	3.4 kg; incl. rechargeable battery
<b>Scope of supply</b>	
Accumulator	Yes
Power supply	Yes
Backpack	Yes
SIMATIC Software	Yes
Recovery media	Yes; Restore & Recovery

### Overview



- External EPROM programming device
- For programming SIMATIC memory cards, SIMATIC micro memory cards as well as SIMATIC EPROM and EEPROM modules
- For connection to the PC via the USB interface

### Technical specifications

Article number	<b>6ES7792-0AA00-0XA0</b> USB Prommer
<b>General information</b>	
Design of the programming device	Desktop device
<b>Display</b>	
Design of display	without
<b>Supply voltage</b>	
Design of the power supply	12 V DC, 1.25 A (via power supply included 100 - 240 V / 50 - 60 Hz / 400 - 200 mA)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	5 °C
• max.	40 °C
<b>Dimensions</b>	
Width	172 mm
Height	40 mm
Depth	121 mm
<b>Weights</b>	
Weight, approx.	400 g

### Ordering data

#### Article No.

#### EPROM programming device, USB Prommer

**6ES7792-0AA00-0XA0**

For programming SIMATIC memory cards and EPROM modules

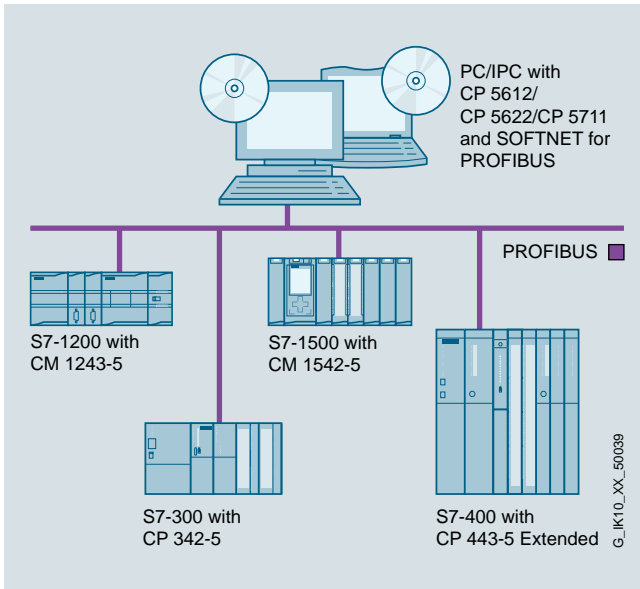
# SIMATIC programming devices

Accessories

Communications software

## SOFTNET for PROFIBUS

### Overview



DP-M	DP-S	FMS	OPC	PG/OP	S7/S5
●	●		●	●	●

- Software for connecting PCs/programming devices and notebooks to automation systems
- Communication services:
  - PROFIBUS DP master Class 1 and 2 with acyclic expansions
  - PROFIBUS DP slave
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE) based on the FDL interface
- The appropriate OPC servers and configuration tools are included in the scope of supply of the respective communications software

### Ordering data

### Article No.

### Article No.

#### SOFTNET-PB S7

Software for S7 communication, incl. FDL protocol with OPC server and configuration tool, runtime software, software and electronic manual on DVD-ROM, license key on USB flash drive, Class A; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711

#### SOFTNET-PB S7 V15

For 32/64-bit: Windows 7 SP1 P for Windows 7 SP1 (Professional, Enterprise, Ultimate), 64-bit  
For Windows Server 2008 R2 SP1 (Standard or Enterprise Edition)  
For Windows Server 2012 R2 Update (Standard Edition)  
For Windows 10 Pro, 64-bit, Version 1607 or higher  
For Windows 10 Enterprise, 64-bit, Version 1607 or higher

English/German

- Single license for one installation

#### Software Update Service

For 1 year with automatic extension  
Requirement: current software version

#### Upgrade

- From Edition 2006 to SOFTNET-S7 Edition 2008 or V15

**6GK1704-5CW15-0AA0**

**6GK1704-5CW00-3AL0**

**6GK1704-5CW00-3AE0**

#### SOFTNET-PB DP

Software for DP protocol (master Class 1 and 2), incl. FDL protocol with OPC server and configuration tool; runtime software, software and electronic manual on DVD-ROM, license key on USB flash drive; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711

#### SOFTNET-PB DP V15

For Windows 7 SP1 (Professional, Enterprise, Ultimate), 64-bit  
For Windows Server 2008 R2 SP1 (Standard or Enterprise Edition)  
For Windows Server 2012 R2 Update (Standard Edition)  
For Windows 10 Pro, 64-bit, Version 1607 or higher  
For Windows 10 Enterprise, 64-bit, Version 1607 or higher  
English/German

- Single license for one installation

#### Software Update Service

For 1 year with automatic extension  
Requirement: current software version

#### Upgrade

- From Edition 2006 to SOFTNET-DP Edition 2008 or V15

**6GK1704-5DW15-0AA0**

**6GK1704-5DW00-3AL0**

**6GK1704-5DW00-3AE0**



Ordering data	Article No.	Technical specifications															
<p><b>SOFTNET-PB DP Slave</b></p> <p>Software for DP slave, with OPC server and configuration tool, single license for one installation, runtime software, software and electronic manual on DVD-ROM, license key on USB flash drive, Class A; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711</p>		<table border="1"> <thead> <tr> <th>Performance data</th> <th>CP 5612/CP 5622/CP 5711</th> </tr> </thead> <tbody> <tr> <td colspan="2"><u>Mono protocol mode</u></td> </tr> <tr> <td>Number of connectable DP slaves</td> <td>max. 60</td> </tr> <tr> <td>Number of FDL tasks waiting</td> <td>max. 50</td> </tr> <tr> <td>Number of PG/OP and S7 connections</td> <td>max. 8</td> </tr> <tr> <td>• DP master</td> <td>DP-V0, DP-V1 with SOFTNET-PB DP</td> </tr> <tr> <td>• DP slave</td> <td>DP-V0, DP-V1 with SOFTNET-PB DP slave</td> </tr> </tbody> </table>		Performance data	CP 5612/CP 5622/CP 5711	<u>Mono protocol mode</u>		Number of connectable DP slaves	max. 60	Number of FDL tasks waiting	max. 50	Number of PG/OP and S7 connections	max. 8	• DP master	DP-V0, DP-V1 with SOFTNET-PB DP	• DP slave	DP-V0, DP-V1 with SOFTNET-PB DP slave
Performance data	CP 5612/CP 5622/CP 5711																
<u>Mono protocol mode</u>																	
Number of connectable DP slaves	max. 60																
Number of FDL tasks waiting	max. 50																
Number of PG/OP and S7 connections	max. 8																
• DP master	DP-V0, DP-V1 with SOFTNET-PB DP																
• DP slave	DP-V0, DP-V1 with SOFTNET-PB DP slave																
<p><b>SOFTNET-PB DP Slave V15</b></p> <p>For Windows 7 SP1 (Professional, Enterprise, Ultimate), 64-bit  For Windows Server 2008 R2 SP1 (Standard or Enterprise Edition)  For Windows Server 2012 R2 Update (Standard Edition)  For Windows 10 Pro, 64-bit, Version 1607 or higher  For Windows 10 Enterprise, 64-bit, Version 1607 or higher  English/German</p> <ul style="list-style-type: none"> <li>• Single license for one installation</li> </ul>	6GK1704-5SW15-0AA0																
<p><b>Software Update Service</b></p> <p>For 1 year with automatic extension  Requirement: current software version</p>	6GK1704-5SW00-3AL0																
<p><b>Upgrade</b></p> <ul style="list-style-type: none"> <li>• From Edition 2006 to SOFTNET-DP Slave Edition 2008 or V15</li> </ul>	6GK1704-5SW00-3AE0																

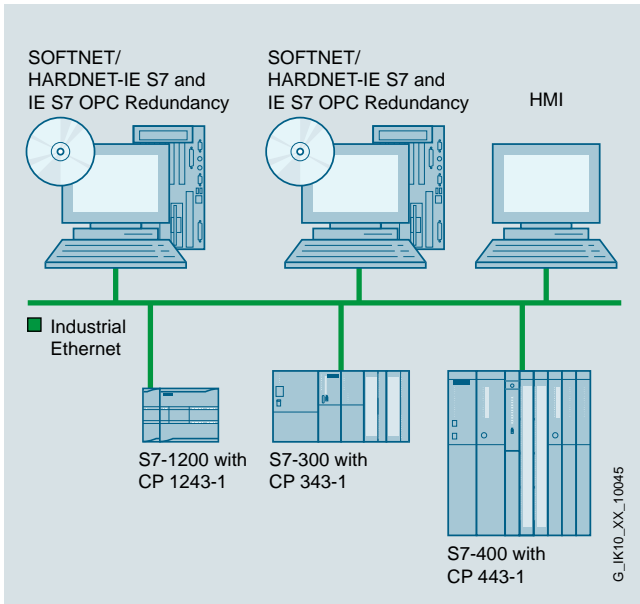
# SIMATIC programming devices

Accessories

Communications software

## SOFTNET for Industrial Ethernet

### Overview



System configuration SOFTNET for Industrial Ethernet

ISO	TCP/UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
●	●			●	●	●	

- Software for coupling programming devices/PCs/workstations to automation systems
- Communication services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
- Can be used with
  - Layer 2 Ethernet card (PCI/PCIe), e.g. CP 1612 A2
  - Integrated Industrial Ethernet interface
  - Modem/ISDN (Remote Access Service RAS)
- Complete protocol stack as a software package
- Increased availability thanks to additional option packages such as OPC server redundancy

### Ordering data

#### Article No.

#### SOFTNET S7 for Industrial Ethernet

Software for S7 and open communication, incl. OPC server, PG/OP communication, and NCM PC/STEP 7 Professional, runtime software, software and electronic manual on DVD, license key on USB flash drive, Class A

#### SOFTNET-IE S7 V16

- For 64-bit:
- Windows 7 SP1 Professional/Enterprise/Ultimate
  - Windows 10 PRO and Ent.
  - Windows Server 2016
  - Windows Server 2012 R2
  - Windows Server 2019

English/German;  
up to 64 connections; floating license for one installation

- On DVD
- Download <sup>1)</sup>

#### Software Update Service

For one year  
with automatic extension;  
Requirement: current software version

**6GK1704-1CW16-0AA0**  
**6GK1704-1CW16-0AK0**

**6GK1704-1CW00-3AL0**

#### Article No.

#### Upgrade

- As of Edition 2006 to current version
- From V6.0, V6.1, V6.2 or V6.3 to V13

**6GK1704-1CW00-3AE0**

**6GK1704-1CW00-3AE1**

#### SOFTNET-IE S7 REDCONNECT V16

Software for fail-safe S7 communication via redundant networks, incl. S7 OPC server, runtime software, software and electronic manual on DVD, license key on USB flash drive, Class A

- For 64-bit:
- Windows 7 SP1 Professional/Enterprise/Ultimate
  - Windows 10 PRO and Ent.
  - Windows Server 2016
  - Windows Server 2012 R2
  - Windows Server 2019

English/German  
• Floating license for one installation

**6GK1704-0HB16-0AA0**

Ordering data	Article No.	Technical specifications	
<b>SOFTNET-IE S7 Lean Edition V16</b> For 64-bit: <ul style="list-style-type: none"> <li>• Windows 7 SP1 Professional/Enterprise/Ultimate</li> <li>• Windows 10 PRO and Ent.</li> <li>• Windows Server 2016</li> <li>• Windows Server 2012 R2</li> <li>• Windows Server 2019</li> </ul> up to eight connections; English/German; floating license for one installation <ul style="list-style-type: none"> <li>• On DVD</li> <li>• Download <sup>1)</sup></li> </ul>	<b>6GK1704-1LW16-0AA0</b> <b>6GK1704-1LW16-0AK0</b>	<b>Performance data</b>	
<b>Software Update Service</b>	<b>6GK1704-1LW00-3AL0</b>	<b>S7 and PG/OP communication</b> (number of operable connections)	
<b>Upgrade</b> <ul style="list-style-type: none"> <li>• As of Edition 2006 to current version</li> <li>• From V6.0, V6.1, V6.2 or V6.3 to V13</li> </ul>	<b>6GK1704-1LW00-3AE0</b> <b>6GK1704-1LW00-3AE1</b>	<ul style="list-style-type: none"> <li>• SOFTNET-IE S7 Extended Max. 255 (S7-300 / S7-400) Max. 512 (S7-1200 / S7-1500)</li> <li>• SOFTNET-IE S7 Max. 64</li> <li>• SOFTNET-IE S7 Lean Max. 8</li> </ul>	
<sup>1)</sup> You can find more details of online software delivery here: <a href="http://www.siemens.com/tia-online-software-delivery">http://www.siemens.com/tia-online-software-delivery</a> under Ordering data.			

## **SIMATIC programming devices**

Accessories

Communications software

Notes

## Products for specific requirements

**14/2 Telecontrol systems for comprehensive applications**

- 14/3 SIPLUS RIC substations for IEC protocol
- 14/4 SIPLUS RIC libraries for S7-1500 and ET 200SP
- 14/5 SIPLUS RIC libraries for SIMATIC ET 200S
- 14/6 SIPLUS RIC libraries for SIMATIC S7-300
- 14/7 SIPLUS RIC libraries for S7-400/S7-400H
- 14/8 SIPLUS RIC libraries for software controllers

**14/9 Automatic door controls**

- 14/10 Automatic door controls for elevators
- 14/11 Control devices
  - 14/11 - SIDOOR AT40 elevator door drive
  - 14/14 - SIDOOR ATE500E elevator door drive
- 14/17 Power supplies
  - 14/17 - Power supply unit
  - 14/19 - Switched-mode power supply
- 14/20 Additional units
  - 14/20 - Software Kit
  - 14/20 - Service Tool
- 14/21 Geared motors
- 14/23 Direct drives
- 14/24 Accessories
- 14/28 Automatic door controls for industrial applications
- 14/29 Control devices
  - 14/29 - SIDOOR ATD401W
  - 14/31 - SIDOOR ATD420W
  - 14/33 - SIDOOR ATD430W
- 14/35 Power supplies
  - 14/36 - 3-phase, 36 V DC
- 14/38 Additional units
  - 14/38 - Software Kit
  - 14/38 - Service Tool
- 14/39 Geared motors
- 14/42 Accessories

**14/45 Automatic door controls for railway applications**

- 14/46 Control devices
  - 14/46 - Platform screen door drive
  - 14/49 - Control device for gap fillers
  - 14/51 - Interior railway door drives
- 14/53 Additional units
  - 14/53 - Software Kit
  - 14/53 - Service Tool
- 14/54 Geared motors
- 14/56 Direct drives
- 14/57 Accessories

**14/60 Condition monitoring systems**

- 14/60 SIPLUS CMS1200 Condition Monitoring System
- 14/61 SIPLUS CMS1200 SM 1281 Condition Monitoring
- 14/63 Accessories

## Products for specific requirements

Telecontrol systems for comprehensive applications

### Telecontrol systems for comprehensive applications

#### Overview

Telecontrol systems for controlling and monitoring widely distributed plants usually consist of a supervisory control system (telecontrol center) and one or more outstations connected over large distances for the automation of distributed plant sections.

SIPLUS RIC is a versatile telecontrol system that uses the internationally standardized telecontrol protocols:

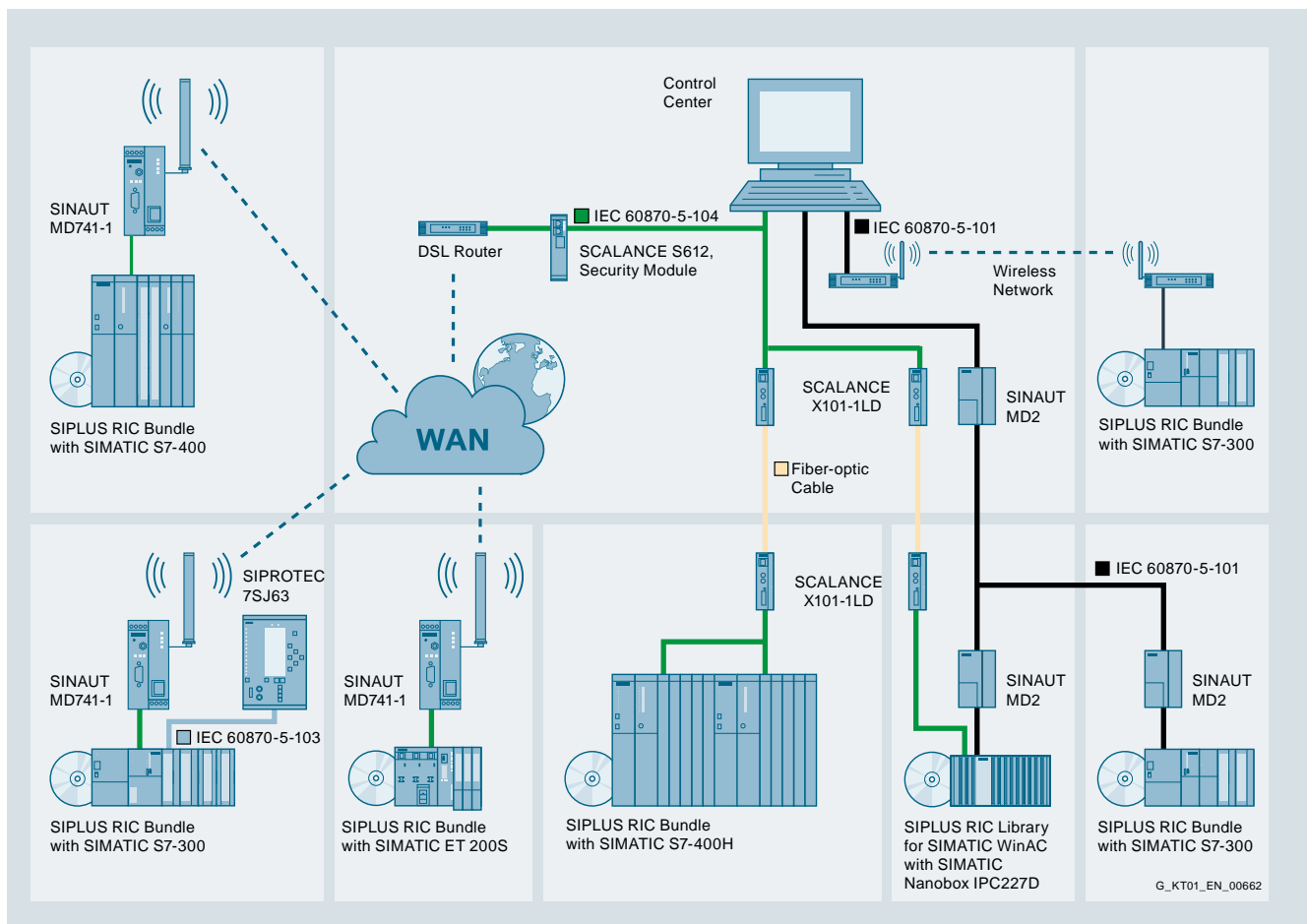
- Serial transmission IEC 60870-5-101
- Ethernet (TCP/IP) IEC 60870-5-104
- Connection of protection devices IEC 60870-5-103

It provides secure communication with reduced data volume for reliable operation in the Wide Area Network (WAN) thanks to event-driven, time-stamped transmission and monitored output of commands.

#### Application

SIPLUS RIC offers maximum functionality and modularity to meet the requirements made upon the monitoring and control of spatially distributed systems, even under extreme environmental conditions.

It is therefore suitable for sectors such as Oil, Gas, Water, Wastewater, Power Generation/Distribution, and Transportation.



**Overview**

IEC 60870-5-101, IEC 60870-5-103 and IEC 60870-5-104 are standardized vendor-independent protocols. With SIPLUS RIC, they can be parameterized with the SIMATIC Manager or TIA Portal V13 SP1 without the need for additional installations.

The protocol IEC 60870-5-101 supports standard WLAN connections via dedicated lines; in the automation system the modems are coupled via RS 232 to the communication modules 1SI, CP 340, CP 341, CP 441, CP 1540 or CP 1541.

The protocol IEC 60870-5-103 permits serial communication with protection devices, e.g. SIPROTEC. Coupling takes place via the 1SI, CP 340, CP 341, CP 441, CM PTP, CP1540 or CP1541 communication modules and RS485 interface with fiber-optic cables.

The IEC 60870-5-104 protocol supports TCP/IP-based WAN connections such as Internet/DSL or GPRS/UMTS/LTE. Either the PN interfaces of the CPUs or the CP 343-1CX10/-1EX30/-1GX30 and CP 1543 communication modules are used as interfaces. Redundancy groups and substitute routes (combinations of serial and Ethernet transmission paths) are both possible and enabled via the interfaces.

The libraries for the IEC 60870-5-101 and -104 protocols are supplied as master and slave including activation for PN-CPU and CP interface. The IEC 60870-5-103 is only provided as master.

SIMATIC Controllers can also communicate with third-party products by means of the IEC protocols.

Information can be forwarded both from lower-level stations and protection devices to the control centers. Automatic updating of the information objects can take place which can then be forwarded with the information object and ASDU address unchanged. These addresses can however also be changed by means of parameter assignment.

## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for S7-1500 and ET 200SP

#### Overview



If a SIMATIC S7-1500/ET 200SP-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-1500/ET 200SP functions for the following data volumes:

- 200 data points, for use with CPU 1510SP-1 PN<sup>1)</sup>, CPU 1511-1 PN and CPU 1511C-1 PN
- 800 data points, for use with CPU 1512SP-1 PN and CPU 1512C-1 PN
- 1000 data points, for use with CPU 1513-1 PN
- 2000 data points, for use with CPU 1515-2 PN
- 4000 data points, for use with CPU 1516-3 PN/DP
- 5000 data points, for use with CPU 1517-3 PN/DP and with CPU 1518-4 PN/DP

The work memory for data is used for buffering the message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices, thus saving hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC Memory Card, which can be used on all CPUs. Four versions with different memory sizes are available for selection.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC Memory Card included in the scope of delivery.

<sup>1)</sup> The CPU 1510SP-1 PN is only suitable for the IEC protocol since memory space is too low for additional functions.

#### Ordering data

#### Article No.

##### SIPLUS RIC libraries for SIMATIC S7-1500/ET 200SP

Runtime license;  
CD with software and documentation

- with SIMATIC Memory Card, 12 MB
- with SIMATIC Memory Card, 24 MB
- with SIMATIC Memory Card, 256 MB
- with SIMATIC Memory Card, 2 GB

**6AG6003-8CF00-0LE0**

**6AG6003-7CF00-0LF0**

**6AG6003-7CF00-0LL0**

**6AG6003-7CF00-0LP0**



## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for SIMATIC ET 200S

#### Overview



If a SIMATIC ET 200S-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC ET 200S functions, for up to 200 information points.

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC Memory Card, which can be used on all CPUs. Two versions with different memory sizes are available for selection.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC Memory Card included in the scope of delivery.

#### Note:

The SIPLUS RIC libraries for ET 200S completely replace the previous SIPLUS RIC ET 200S bundles and SIPLUS RIC ET 200S extreme bundles.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC ET 200S

Runtime license;  
CD with software and documentation

- with SIMATIC Memory Card, 512 KB
- with SIMATIC Memory Card, 2 MB

#### Article No.

**6AG6003-5CF00-0CA0**

**6AG6003-5CF00-0DA0**

## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for SIMATIC S7-300

#### Overview



If a SIMATIC S7-300-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-300 functions, for the following data quantities:

- 200 information points, for use with CPU 314
- 1 000 information points, for use with CPU 315
- 2 000 information points, for use with CPU 317
- 5 000 information points, for use with CPU 319

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC Memory Card, which can be used on all CPUs. Two versions with different memory sizes are available for selection.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC Memory Card included in the scope of delivery.

#### Note:

The SIPLUS RIC libraries for S7-300 completely replace the previous SIPLUS RIC S7-300 bundles and SIPLUS RIC S7-300 extreme bundles.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC S7-300

Runtime license;  
CD with software and documentation

- with SIMATIC Memory Card, 512 KB
- with SIMATIC Memory Card, 2 MB

#### Article No.

**6AG6003-1CF00-0CA0**

**6AG6003-1CF00-0DA0**

## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for S7-400/S7-400H

#### Overview



If a SIMATIC S7-400/S7-400H-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-400/S7-400H functions for the following data quantities:

- 1 000 information points, for use with CPU 412 or CPU 412H
- 2 000 information points, for use with CPU 414 or CPU 414H
- 5 000 information points, for use with CPU 410H, CPU 416/CPU 416H or CPU 417/CPU 417H

The work memory for data which is limited to 256 MB in the CPU 410H for data blocks generated online is used for buffering the frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries are supplied on a CD and can be used on all CPUs.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A memory card (CPU V5.0 or higher) or a CPU (CPU V4.x or higher and CPU 410H) are licensed. All IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols are activated via the email address [siplus-ric.automation@siemens.com](mailto:siplus-ric.automation@siemens.com).

#### Note:

The SIPLUS RIC libraries for S7-400 completely replace the previous SIPLUS RIC S7-400 bundles, SIPLUS RIC S7-400 extreme bundles, and IEC 60870 libraries for SIMATIC PCS 7.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC S7-400

Runtime license for SIMATIC S7-400 firmware version 4.x or higher; CD with software and documentation;  
Note:  
If used in S7-400H systems, a license will be required for each CPU.

#### Article No.

**6AG6003-3CF00-0AA0**

## Products for specific requirements

Telecontrol systems for comprehensive applications

SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for software controllers

#### Overview



If a SIMATIC WinAC RTX-/S7-1500 Software Controller/ Open Controller-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

The SIPLUS RIC software libraries are based on the standard SIMATIC Manager (WinAC) or TIA Portal (S7-1500 Software Controller / Open Controller) and can be used on various, mutually compatible types of SIMATIC S7 devices – thus saving on hardware costs and programming overhead.

The libraries are supplied on a CD and can be used for all WinAC-RTX-/S7-1500 Software Controller/Open Controller systems.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

All IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols are activated via the email address [siplus-ric.automation@siemens.com](mailto:siplus-ric.automation@siemens.com).

#### Note:

The SIPLUS RIC libraries for PC-based Automation include SIPLUS RIC libraries for:

- SIMATIC ET 200SP Open Controller, CPU 1515SP PC
- SIMATIC S7-1500 Software Controller
- SIMATIC WinAC

#### Ordering data

##### SIPLUS RIC libraries for software controllers

Runtime license;  
CD with software and  
documentation

#### Article No.

**6AG6003-0CF00-0AA0**

Overview



SIDOOR automatic door control systems

Door control system is the general term for a controller of an access system.

The SIDOOR product family is primarily intended for the operation of sliding doors, whereby these doors can be operated both horizontally and vertically.

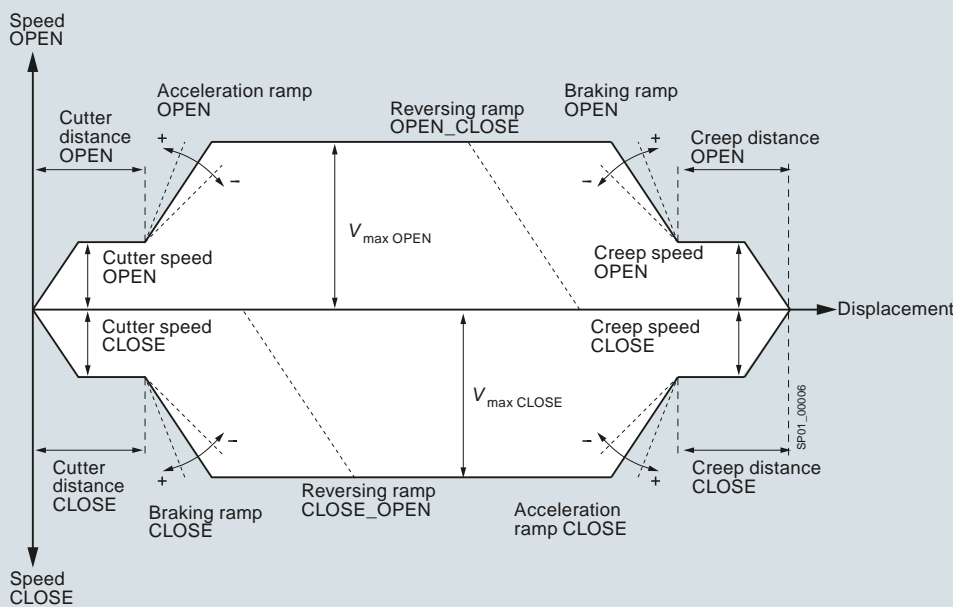
Door control systems are characterized by the fact that there are always two defined states for the open and closed position of the door.

The door is always controlled, regulated and moved between these two positions in accordance with the guidelines of the respective application.

In a defined learn run via "single-button operation", the door system independently determines the values for the door width, the dynamic door weight and the drive direction of the geared motor and stores these data in a non-volatile memory.

The optimum drive characteristics at the door are automatically calculated and are consistently adhered to.

The travel curve transitions are rounded off so that the door movement is smooth and jerk-free.



- Creep speed                      Reduced speed in the vicinity of the OPEN position of the elevator door (creep distance)
- Cutter speed                    Reduced speed in the vicinity of the CLOSED position of the elevator door (cutter distance)
- Creep distance                 Range of door travel in the vicinity of the OPEN position
- Cutter distance                 Range of door travel in the vicinity of the CLOSED position
- $V_{max}$                             Maximum permissible door speed

- Reversing ramp OPEN\_CLOSE    Travel reverses from the OPEN to the CLOSE direction
- Reversing ramp CLOSE\_OPEN    Travel reverses from the CLOSE to the OPEN direction

Note:  
When reversing from the open to the close direction, the door is braked with the reversing ramp OPEN\_CLOSE, and starts the closing movement with the acceleration ramp CLOSE.

Travel curve

## Products for specific requirements

### Automatic door controls

#### for elevators

#### Overview

The elevator door drive is comprised of a controller and the maintenance-free drive unit, geared motor or gearless EC technology direct drive motor.

Control devices are electronic controllers connected to the power supply via an external power supply unit (SIDOOR NT40 or SIDOOR Transformer). They are generally connected to the higher-level controller via digital or fieldbus interfaces, and can be configured via a user interface.

The SIDOOR AT40 and SIDOOR ATE500E control devices can be used to operate horizontally operated cabin and shaft doors as well as vertical doors for lifting or rolling doors at adjustable speeds and accelerations.

Geared motors form the maintenance-free drive unit in the door drive. The geared motors feature DC motors with non-self-locking gearing, and are speed-controlled. The set force and speed limits are not exceeded. The gearless motor (direct drive) is the maintenance-free drive unit of the door drive.

Operation of the named door drives does not require limit switches. The door width and the "OPEN"/"CLOSE" positions are determined automatically.

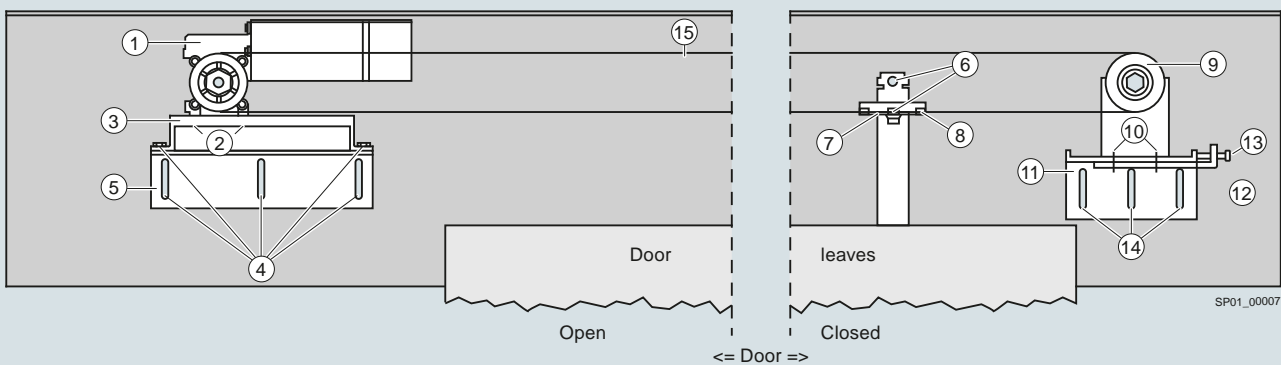
The power is transmitted by a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with 2 door clutch holders. This enables it to drive both one-sided and centrally-opening doors. The accessories are not included in the scope of supply, see "Additional units" on page 14/24.

#### Design

The product-specific property of the elevator door controllers is based on the fact that the closing weights/closing springs integrated in the shaft doors are also taken into account.

These weights/springs are integrated in the shaft doors so that open doors close automatically if the cabin is not at the relevant floor.

They must also be moved by the elevator door drive in their opening direction and support it in the closing movement.



#### Complete motor mounting

- ① Geared motor
- ② 4 x locking hexagonal safety bolts M5 x 10
- ③ Rubber-metal anti-vibration mount
- ④ 10 x locking hexagonal safety bolts M6 x 16
- ⑤ Mounting bracket for the motor mounting

#### Mounting material for door clutch holder

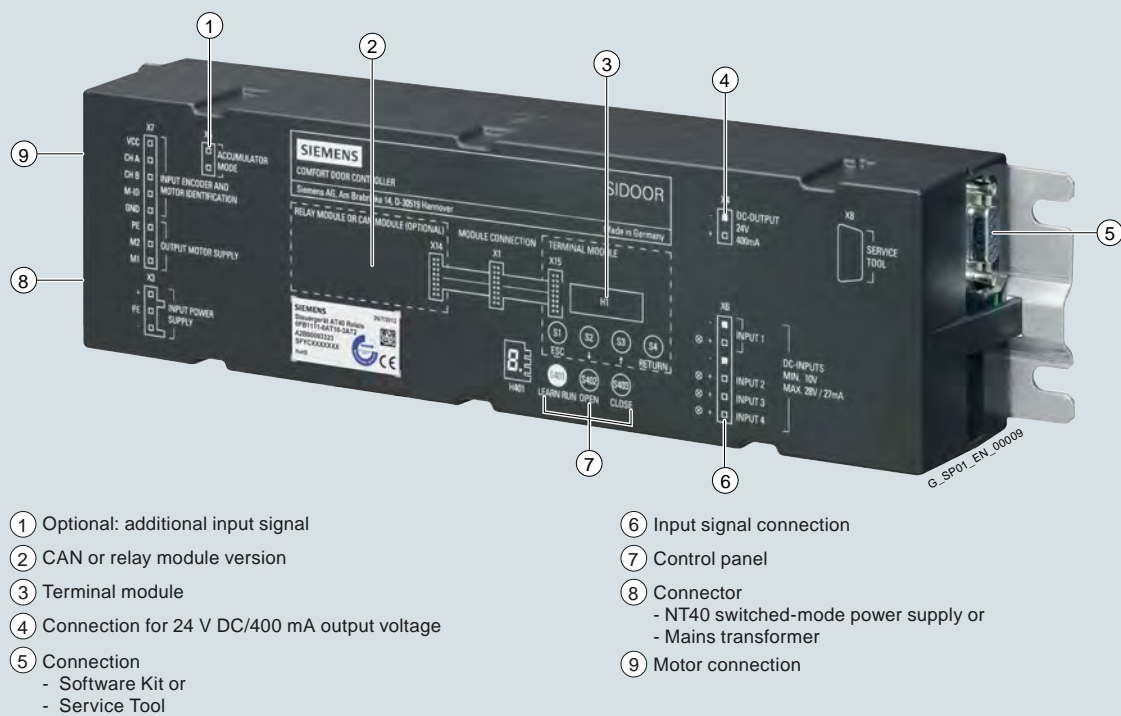
- ⑥ 2 x locking hexagonal safety bolts M6 x 12
- ⑦ Door clutch holder
- ⑧ Clamping plate

#### Deflector unit and clamping device

- ⑨ Deflector unit
- ⑩ 2 x locking hexagonal safety bolts M6 x 12
- ⑪ Mounting bracket for the deflector unit and tensioning device
- ⑫ Tensioning lug for the deflector unit and tensioning device
- ⑬ Tensioning screw M6 x 30
- ⑭ 10 x locking hexagonal safety bolts M6 x 16
- ⑮ Toothed belt (length 4 m)

Mounting suggestion for door control systems

## Overview



SIDOOR AT40 elevator door drive (relay module version)

SIDOOR AT40 – SIDOOR enables the quick, easy and versatile installation, configuration and operation of a wide range of elevator door systems.

• Version:

- RELAY (including relay and terminal module)
- CAN (including CAN and terminal module), two controllers are available: SIDOOR AT40 CAN and CAN ADV.
  - Certified by CiA (CiA 301 / CiA 417).
  - The door system can be visualized and parameterized by the elevator controller using the "Virtual Terminal" function.
  - With the SIDOOR AT40 CAN ADV controller, parameters for evaluating mechanical wear can be provided at the door. These parameters can be accessed from the CAN-BUS via the elevator controller or other bus nodes and can be evaluated floor-dependently by an external evaluation logic. It includes, e.g. event counters, maximum current values in the slow end distance of the door, traversing times and energy values of the opening and closing cycles, as well as other performance values.
  - The evaluation can affect the maintenance cycles of the elevator system.

- For dynamic door weights up to 600 kg, depending on motor variant
- Automatic door weight detection
- 4 to 8 kg maximum counterweight (depending on motor version)
- Operating temperature -20 to +50 °C
- Flexible motor management (four different motor types), automatic detection
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC  $\pm$  15 %; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Supports power-optimized operation in the elevator cabin
- Vandal-proof
- IP54 degree of protection for 180 to 600 kg motor versions, gear unit IP40 (SIDOOR M5: entirely IP54)
- The current operating states are indicated via a 7-segment display or a terminal module directly in the elevator door drive or externally. The SIDOOR SOFTWARE KIT or the SIDOOR SERVICE TOOL is used for this, see "Additional units".

## Ordering data

## Article No.

## SIDOOR AT40 elevator door drive

horizontal, up to 600 kg door weight

- Control device with RELAY (including relay and terminal module)

6FB1111-0AT10-3AT2

## Article No.

- Control device with CAN (including CAN and terminal module),

6FB1111-1AT10-3AT3

- Control device with CAN module and maintenance data via CANopen

6FB1111-1AT11-3AT3

## Products for specific requirements

Automatic door controls  
for elevators

Control devices > SIDOOR AT40 elevator door drive

### Technical specifications

Article number	6FB1111-0AT10-3AT2	6FB1111-1AT10-3AT3	6FB1111-1AT11-3AT3
	SIDOOR AT40 RELAY	SIDOOR AT40 CAN	SIDOOR AT40 CAN ADV
<b>General information</b>			
Product type designation	AT40 RELAY		AT40 CAN ADV
<b>Supply voltage</b>			
Design of the power supply	via SIDOOR TRANSFORMER / NT40		
<b>Input current</b>			
Current consumption, max.	10 A		
I <sup>2</sup> t, min.	30 A <sup>2</sup> ·s		
<b>Encoder supply</b>			
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!		
short-circuit proof	Yes		
<b>24 V encoder supply</b>			
• Output current, max.	400 mA		
<b>Power</b>			
Active power input	80 W		
Active power input, max.	540 W		
Active power input (standby mode)	5 W	6 W	
<b>Digital inputs</b>			
Control inputs isolated	Yes		
Control inputs p-switching	Yes		
<b>Input voltage</b>			
• for signal *0*, min.	-3 V		
• for signal *0*, max.	5 V		
• for signal *1*, min.	10 V		
• for signal *1*, max.	28 V		
<b>Input current</b>			
• for signal *0*, max. (permissible quiescent current)	0.5 mA		
• for signal *1*, min.	9 mA		
• for signal *1*, max.	27 mA		
<b>Digital outputs</b>			
<b>Relay outputs</b>			
<b>Switching capacity of contacts</b>			
- at 30 V DC, min.	0.01 A		
- at 30 V DC, max.	1 A		0.5 A
- at 50 V DC, min.	0.01 A; Switching voltage 50 V DC		
- at 50 V DC, max.	1 A; Switching voltage 50 V DC		
- at 230 V AC, min.	0.01 A		
- at 230 V AC, max.	1 A		
<b>Mechanical data</b>			
Opening width of door, min.	0.3 m		
Opening width of door, max.	5 m		
Weight of door, max.	600 kg		
Operating cycle frequency of door, max.	180 1/h		
Counterforce, max.	80 N		
Kinetic energy, max.	100 J		
<b>Counterweight</b>			
• with SIDOOR M2 geared motor, max.	4 kg		
• with SIDOOR M3 geared motor, max.	6 kg		
• with SIDOOR M4 geared motor, max.	8 kg		
• with SIDOOR M5 geared motor, max.	8 kg		



**Technical specifications**

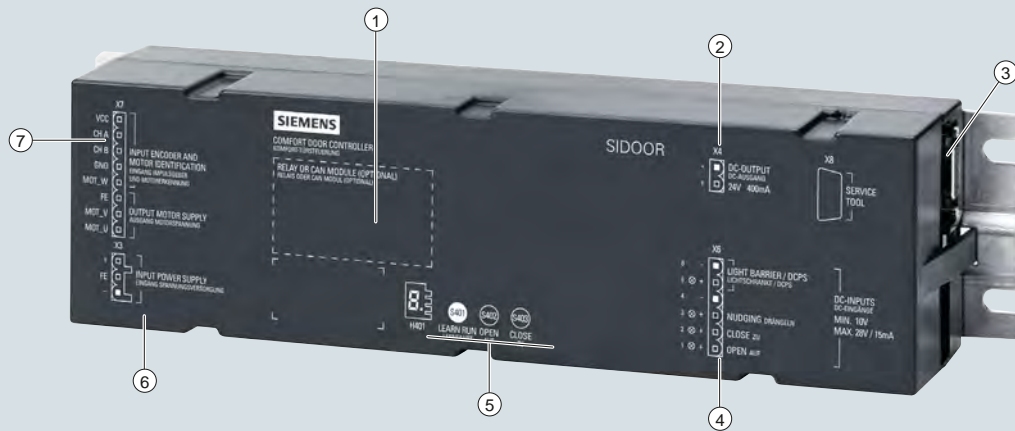
Article number	<b>6FB1111-0AT10-3AT2</b>	<b>6FB1111-1AT10-3AT3</b>	<b>6FB1111-1AT11-3AT3</b>
	SIDOOR AT40 RELAY	SIDOOR AT40 CAN	SIDOOR AT40 CAN ADV
<b>Interfaces</b>			
Interfaces/bus type	without	CANopen, CiA standard 301, profile 417	
Number of bus nodes		32	
<b>Standards, approvals, certificates</b>			
Certificate of suitability according to EN 81	Yes		
CE mark	Yes		
UL approval	No		
EAC (formerly Gost-R)	Yes		
TÜV Inspectorate approval	Yes		
TÜV prototype tested	Yes		
China RoHS compliance	Yes		
Standard for safety	EN 61010-1 / EN 61010-2-201 / EN 81-20		
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-20 °C		
• max.	50 °C		
<b>Ambient temperature during storage/transportation</b>			
• Storage, min.	-40 °C		
• Storage, max.	50 °C		
<b>Altitude during operation relating to sea level</b>			
• Installation altitude above sea level, max.	2 000 m		
<b>Relative humidity</b>			
• No condensation, min.	10 %		
• No condensation, max.	93 %		
<b>Dimensions</b>			
Width	320 mm		
Height	60 mm		
Depth	80 mm		

## Products for specific requirements

Automatic door controls  
for elevators

Control devices > SIDOOR ATE500E elevator door drive

### Overview



- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>① CAN module or RELAY module</li> <li>② Output voltage 24 V DC/400 mA connection</li> <li>③ Connection             <ul style="list-style-type: none"> <li>- service tool</li> <li>- software kit</li> </ul> </li> <li>④ Input signal connection</li> </ul> | <ul style="list-style-type: none"> <li>⑤ Control panel</li> <li>⑥ Connection             <ul style="list-style-type: none"> <li>- NT40 switch mode power supply</li> <li>- Transformer</li> </ul> </li> <li>⑦ Motor connection (direct drive)</li> </ul> |
|---|--|

SIDOOR ATE500E elevator door drive

The SIDOOR ATE500E elevator door drive enables the quick, easy and versatile installation, configuration and operation of EC technology gearless elevator door systems.

- Design:
  - Relay module
  - CAN module
- For dynamic door weights up to 280 kg
- High control performance and optimized drive characteristic transitions
- Automatic door weight detection (single-button commissioning)
- 6 kg maximum counterweight of the coupled floor door
- Operating temperature -25 to +50 °C without restrictions

- Automatic identification of the connected motor
- Opening width 0.3 to 5 m
- Auxiliary voltage output 24 V DC  $\pm$  15%; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Optimized energy consumption during cabin operation (DCPS)
- Vandal-proof
- IP20 degree of protection
- The current operating states are indicated via a 7-segment display directly in the elevator door drive or externally using the Software Kit or Service Tool, see "Additional units".

### Ordering data

### Article No.

#### SIDOOR ATE500E elevator door drive

- Control device with relay module
- Control device with CAN module

6FB1211-5AT10-7AT2

6FB1211-1AT10-7AT3

**Technical specifications**

Article number	6FB1211-5AT10-7AT2	6FB1211-1AT10-7AT3
	SIDOOR ATE500E RELAY	SIDOOR ATE500E CAN
<b>General information</b>		
Mean time between failures (MTBF)	19 y	
<b>Installation type/mounting</b>		
Installation and mounting instructions	no direct solar radiation, final application-specific requirements must be observed; installation outside a control cabinet only in horizontal mounting position NFPA elevator environment: must be installed in a fire protection enclosure	
<b>Supply voltage</b>		
Design of the power supply	Via SIDOOR TRANSFORMER / NT40 or via DC	
Rated value (DC)	36 V; with MED280: At 24 V DC max. door speed of 500 mm/s; at 28.8 V DC max. door speed of 800 mm/s	
<b>Input current</b>		
I <sup>2</sup> t, min.	30 A <sup>2</sup> ·s	
<b>Encoder supply</b>		
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!	
short-circuit proof	Yes	
Overload-proof	Yes	
<b>24 V encoder supply</b>		
• Output current, max.	400 mA	
<b>Power</b>		
Active power input	85 W	
Active power input, max.	540 W	
Active power input (standby mode)	5 W	6 W
<b>Digital inputs</b>		
Control inputs isolated	Yes	
Control inputs p-switching	Yes	
<b>Input voltage</b>		
• for signal *0*, min.	-3 V	
• for signal *0*, max.	5 V	
• for signal *1*, min.	10 V	
• for signal *1*, max.	28 V	
<b>Input current</b>		
• for signal *1*, min.	3 mA	
• for signal *1*, max.	15 mA	
<b>Digital outputs</b>		
<b>Relay outputs</b>		
<b>Switching capacity of contacts</b>		
- at 30 V DC, min.	0.01 A	0.5 A
- at 30 V DC, max.	1 A	
- at 50 V DC, min.	0.01 A; 50 V DC switching voltage not released for NFPA-relevant countries	
- at 50 V DC, max.	1 A; 50 V DC switching voltage not released for NFPA-relevant countries	
- at 230 V AC, min.	0.01 A	
- at 230 V AC, max.	1 A	
<b>Mechanical data</b>		
Opening width of door, min.	0.3 m	
Opening width of door, max.	5 m	
Weight of door, max.	280 kg	
Operating cycle frequency of door, max.	180 1/h	
Kinetic energy, max.	75 J	
<b>Counterweight</b>		
• with SIDOOR MED280 direct drive, max.	6 kg	
<b>Interfaces</b>		
Interfaces/bus type	without	CANopen, CiA standard 301, profile 417
Number of bus nodes		32

## Products for specific requirements

Automatic door controls  
for elevators

Control devices > SIDOOR ATE500E elevator door drive

### Technical specifications

Article number	6FB1211-5AT10-7AT2	6FB1211-1AT10-7AT3
	SIDOOR ATE500E RELAY	SIDOOR ATE500E CAN
<b>Standards, approvals, certificates</b>		
Certificate of suitability according to EN 81	Yes	
CE mark	Yes	
UL approval	Yes	
EAC (formerly Gost-R)	Yes	
TÜV Inspectorate approval	Yes	
TÜV prototype tested	Yes	
China RoHS compliance	Yes	
Standard for safety	EN 61010-1 / EN 61010-2-201 / UL 61010-1 / UL 61010-2-201 / EN 81-20 / EN ISO 13849-1 Cat. 2 PL d / IEC 62061: SIL 2	
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C	
• max.	50 °C	
• Remark	Bolt the controller onto a metal mounting surface so that thermal conductivity is ensured	
<b>Ambient temperature during storage/transportation</b>		
• Storage, min.	-40 °C	
• Storage, max.	85 °C	
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	
<b>Relative humidity</b>		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
<b>Dimensions</b>		
Width	320 mm	
Height	60 mm	
Depth	80 mm	

**Overview**

SIDOOR Transformer

The SIDOOR TRANSFORMER and SIDOOR TRANSFORMER UL are standard power supply units operated with 220-240 V AC, 50/60 Hz, from the SIDOOR product range. They can be used for controllers capable of controlling masses of up to 400 kg.

**Ordering data****Article No.**

<b>SIDOOR Transformer power supply</b>	<b>6FB1112-0AT20-2TR0</b>
<b>SIDOOR Transformer power supply</b> with UL approval	<b>6FB1112-0AT21-2TR0</b>

**Technical specifications**

Article number	<b>6FB1112-0AT20-2TR0</b>	<b>6FB1112-0AT21-2TR0</b>
	SIDOOR TRANSFORMER	SIDOOR TRANSFORMER UL
<b>Installation type/mounting</b>		
Mounting type	Hexagon head bolt M6, L > 70 mm	
<b>Supply voltage</b>		
relative symmetrical tolerance of the supply voltage	10 %	
<b>Line frequency</b>		
• permissible range, lower limit	50 Hz	
• permissible range, upper limit	60 Hz	
<b>Mains filter</b>		
• integrated	Yes	
<b>Input current</b>		
Current consumption, max.	1.6 A	
Operational current of fuse protection at input, min.	6 A	
Operational current of fuse protection at input, max.	10 A	
Tripping characteristic class of fuse protection at input	D6, C10	
<b>Output voltage</b>		
RMS value (pulsating DC voltage at full load)	17.3 V; at 230 V AC	
RMS value (pulsating DC voltage at full load), min.	16.5 V	
RMS value (pulsating DC voltage at full load), max.	18 V	
RMS value (pulsating DC voltage at 0.7 mA peak current), max.	27 V; At 264 V AC	
<b>Output current</b>		
Current output (rated value)	14.3 A; t on 2 s / t off 8 s	
<b>Power</b>		
Emitted active power, max.	115 W; Average value above 10 s	

## Products for specific requirements

Automatic door controls  
for elevators

Power supplies > Power supply unit

### Technical specifications

Article number	6FB1112-0AT20-2TR0	6FB1112-0AT21-2TR0
	SIDOOR TRANSFORMER	SIDOOR TRANSFORMER UL
<b>Standards, approvals, certificates</b>		
CE mark	Yes	
EAC (formerly Gost-R)	Yes	
RoHS conformity	Yes	
China RoHS compliance	Yes	
Standard for EMC	EN 12015 / EN 12016 / EN 61000-6-2 / EN 61000-6-3 / EN 61000-3-2 / EN 61000-3-3	
Standard for safety	Low Voltage Directive (LVD) 2014/35/EU	UL 61010-1, CSA C22.2 No. 61010-1-12, Low Voltage Directive (LVD) 2014/35/EU
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-20 °C	
• max.	55 °C	
• Remark	No direct exposure to the sun	
<b>Ambient temperature during storage/transportation</b>		
• Storage, min.	-20 °C	
• Storage, max.	70 °C	
• Transportation, min.	-40 °C	
• Transportation, max.	70 °C	
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	
<b>Relative humidity</b>		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
<b>Cables</b>		
Cable length		
• Input side	2 m	
• Output side	1.5 m	
<b>Connection method</b>		
Design of electrical connection at input	SCHUKO connector DIN 49.441, CEE7/VII	equipped with ferrules
<b>Dimensions</b>		
Width	145 mm	
Height	65 mm	
Depth	126 mm	

**Overview**


The SIDOOR NT40 switched-mode power supply unit is operated with 230 V AC ( $\pm 15\%$ ), 50/60 Hz, to power the elevator door controllers.

It is especially suitable for door systems with high door weights.

On the output side, the power supply unit delivers a voltage of 36 V DC ( $\pm 3\%$ ) SELV at a rated output power of  $< 100$  W.

In order to enable fast acceleration/deceleration of the doors by the controller, the device can briefly ( $< 2$  s) deliver a current of 15 A (corresponds to a short-time power output of 540 W).

**Ordering data**
**Article No.**

<b>SIDOOR NT40 switched-mode power supply</b>	<b>6FB1112-0AT20-3PS0</b>
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**Technical specifications**

Article number	<b>6FB1112-0AT20-3PS0</b> SIDOOR NT40
<b>Installation type/mounting</b>	
Mounting type	Four 5 mm screws
<b>Supply voltage</b>	
Rated value (AC)	230 V
relative symmetrical tolerance of the supply voltage	15 %
<b>Line frequency</b>	
• permissible range, lower limit	50 Hz
• permissible range, upper limit	60 Hz
<b>Input current</b>	
Current consumption for 2 s, max.	3.5 A
Rated value at 230 V AC	0.7 A
Operational current of fuse protection at input, min.	6 A
Operational current of fuse protection at input, max.	10 A
Tripping characteristic class of fuse protection at input	B
<b>Output voltage</b>	
Rated value (DC)	36 V; SELV
Relative symmetrical tolerance of the output voltage	3 %

Article number	<b>6FB1112-0AT20-3PS0</b> SIDOOR NT40
<b>Output current</b>	
Current output (rated value)	2.5 A
Temporary overload current (for 2 s maximum)	15 A
<b>Power</b>	
Active power input, max.	100 W
Emitted active power, max.	100 W
Emitted active power (restricted to 2 s)	540 W
Efficiency at 230 V AC (with 100 W emitted active power)	90 %
Active apparent power, max.	650 V·A
<b>Standards, approvals, certificates</b>	
CE mark	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Standard for EMC	EMC Directive 2004/108/EC, EN 12015, EN 12016
Standard for safety	EN 61010-1 / EN 61010-2-201
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	55 °C
• Remark	No direct exposure to the sun
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-20 °C
• Storage, max.	70 °C
• Transportation, min.	-40 °C
• Transportation, max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• No condensation, min.	10 %
• No condensation, max.	93 %
<b>Cables</b>	
Cable length	
• Input side	2 m
• Output side	1.5 m
<b>Connection method</b>	
Design of electrical connection at input	SCHUKO connector DIN 49.441, CEE7/VII
<b>Dimensions</b>	
Width	270 mm
Height	55 mm
Depth	80 mm

## Products for specific requirements

Automatic door controls  
for elevators

Additional units > Software Kit, Service Tool

### Overview Software Kit



#### SIDOOR Software Kit

The scope of delivery of the SDOOR Software Kit includes an installation CD.

The CD includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

#### Note:

Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

#### Ordering data

#### Article No.

<b>SIDOOR Software Kit</b>	<b>6FB1105-0AT01-6SW0</b>
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### Overview Service Tool



The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

The Service Tool is connected to the various controllers by the respective cable.

You do not need to open the cover of the controller to do this.

#### Note:

If the Service Tool is in the "Quick adjustment" or "Total adjustment" menu, the run commands of the controller are blocked via the command inputs.

#### Ordering data

#### Article No.

#### SIDOOR Service Tool, hand-held terminal

for parameter assignment of control devices

**6FB1105-0AT01-6ST0**



**Overview**

SIDOOR geared motors are a combination of gear unit, motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free, variable speed drive unit comprises a DC motor with non-self-locking gearing.

The geared motors must be selected according to the mass to be moved. Two different versions are available for each of the SIDOOR M2 to SIDOOR M5 geared motors, with gear output on the left or on the right: The gear outlet direction is defined as left or right when viewing the gear unit from the front.

- SIDOOR M2 geared motors (max. door weight 120 kg)
  - SIDOOR M2 L (pinion left) 6FB1103-0AT10-5MA0
  - SIDOOR M2 R (pinion right) 6FB1103-0AT11-5MA0
- SIDOOR M3 geared motors (max. door weight 180 kg)
  - SIDOOR M3 L (pinion left) 6FB1103-0AT10-4MB0
  - SIDOOR M3 R (pinion right) 6FB1103-0AT11-4MB0
- SIDOOR M4 geared motors (max. door weight 400 kg)
  - SIDOOR M4 L (pinion left) 6FB1103-0AT10-3MC0
  - SIDOOR M4 R (pinion right) 6FB1103-0AT11-3MC0
- SIDOOR M5 geared motors (max. door weight 600 kg)
  - SIDOOR M5 L (pinion left) 6FB1103-0AT10-3MD0
  - SIDOOR M5 R (pinion right) 6FB1103-0AT11-3MD0



Geared motors:  
SIDOOR M2 L 6FB1103-0AT10-5MA0 (version with pinion left),  
SIDOOR M3 L 6FB1103-0AT10-4MB0 (version with pinion left),  
SIDOOR M4 L 6FB1103-0AT10-3MC0 (version with pinion left),  
SIDOOR M5 L 6FB1103-0AT10-3MD0 (version with pinion left)  
(Images are shown in the order from bottom to top)

**Ordering data****SIDOOR M2 geared motors**

M2 L	<b>6FB1103-0AT10-5MA0</b>
M2 R	<b>6FB1103-0AT11-5MA0</b>

**SIDOOR M3 geared motors**

M3 L	<b>6FB1103-0AT10-4MB0</b>
M3 R	<b>6FB1103-0AT11-4MB0</b>

**SIDOOR M4 geared motors**

M4 L	<b>6FB1103-0AT10-3MC0</b>
M4 R	<b>6FB1103-0AT11-3MC0</b>

**SIDOOR M5 geared motors**

M5 L	<b>6FB1103-0AT10-3MD0</b>
M5 R	<b>6FB1103-0AT11-3MD0</b>

**Technical specifications**

Article number	6FB1103-0AT10-5MA0	6FB1103-0AT11-5MA0	6FB1103-0AT10-4MB0	6FB1103-0AT11-4MB0	6FB1103-0AT10-3MC0	6FB1103-0AT11-3MC0	6FB1103-0AT10-3MD0	6FB1103-0AT11-3MD0
	SIDOOR M2 L	SIDOOR M2 R	SIDOOR M3 L	SIDOOR M3 R	SIDOOR M4 L	SIDOOR M4 R	SIDOOR M5 L	SIDOOR M5 R
<b>Supply voltage</b>								
Rated value (DC)	24 V		30 V					
<b>Input current</b>								
Operational current (rated value)	1.8 A		4 A		7.5 A			
<b>Power</b>								
Active power input	43 W		120 W		225 W			
<b>Mechanical data</b>								
Torque of the rotary operating mechanism (rated value)	1.05 N·m		3 N·m		6.8 N·m			
Speed, max.	0.5 m/s		0.65 m/s		0.75 m/s		0.5 m/s	
Gear ratio	15							
Number of pulses per revolution, max.	100							
Weight of door, max.	120 kg		180 kg		400 kg		600 kg	

## Products for specific requirements

Automatic door controls  
for elevators

### Geared motors

#### Technical specifications

Article number	6FB1103-0AT10-5MA0	6FB1103-0AT11-5MA0	6FB1103-0AT10-4MB0	6FB1103-0AT11-4MB0	6FB1103-0AT10-3MC0	6FB1103-0AT11-3MC0	6FB1103-0AT10-3MD0	6FB1103-0AT11-3MD0
	SIDOOR M2 L	SIDOOR M2 R	SIDOOR M3 L	SIDOOR M3 R	SIDOOR M4 L	SIDOOR M4 R	SIDOOR M5 L	SIDOOR M5 R
<b>Standards, approvals, certificates</b>								
CE mark	Yes							
UL approval	No		Yes					
EAC (formerly Gost-R)	Yes							
TÜV Inspectorate approval	Yes							
China RoHS compliance	Yes							
<b>Ambient conditions</b>								
<b>Ambient temperature during operation</b>								
• min.	-20 °C							
• max.	50 °C							
<b>Ambient temperature during storage/transportation</b>								
• Storage, min.	-40 °C							
• Storage, max.	85 °C							
<b>Dimensions</b>								
Height of motor	90 mm		98 mm		115 mm		124 mm	
Length of motor	207 mm		236 mm		275 mm		344 mm	
Diameter of motor	48 mm		63 mm				80 mm	
Width of gear unit, including drive pinion	90 mm		85 mm		105 mm		111 mm	

## Overview



SIDOOR MED280 direct drive

SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor with non-self-locking gearing.

Direct drives are designed for certain masses and can control both drive directions.

- SIDOOR MED280 direct drive for max. 280 kg (6FB1203-0AT12-7DA0)

## Ordering data

### Article No.

#### SIDOOR MED280 direct drive

Motor for door control, for max. dynamic door weights of 280 kg

6FB1203-0AT12-7DA0

## Technical specifications

Article number	<b>6FB1203-0AT12-7DA0</b> SIDOOR MED280
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
Operational current (rated value)	9.7 A
<b>Power</b>	
Active power input	233 W
<b>Mechanical data</b>	
Torque of the rotary operating mechanism (rated value)	4.7 N·m
Speed, max.	0.8 m/s
Number of pulses per revolution, max.	1 024
Weight of door, max.	280 kg
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C
• max.	70 °C
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	85 °C
<b>Dimensions</b>	
Width of motor	160 mm
Height of motor	140 mm
Length of motor	56 mm
• including drive pinion	91 mm

## Products for specific requirements

Automatic door controls  
for elevators

### Accessories

#### Overview

#### **A range of accessories is available for SIDOOR elevator door drive systems with geared motors:**

This is necessary to ensure low-noise operation of the door leaves by the controller. The geared motors can be optimally integrated into the respective door drive system.

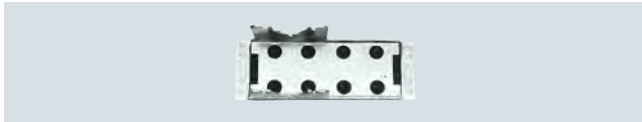
#### Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR M2 and SIDOOR M3 geared motors.
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for SIDOOR M4 and SIDOOR M5 geared motors.



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0

#### Mounting brackets

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for the geared motors for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit. For setting the toothed belt to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

#### Door clutch holder

The door clutch holder serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

A door clutch holder is available for each toothed belt width:

- Width 12 mm: 6FB1104-0AT01-0CP0
- Width 14 mm: 6FB1104-0AT02-0CP0



Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

#### Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system.

The STS toothed belt is redirected via this deflector unit (toothed belt width 12 mm or 14 mm).



Deflector unit 6FB1104-0AT03-0AS0

**Overview**STS toothed belt

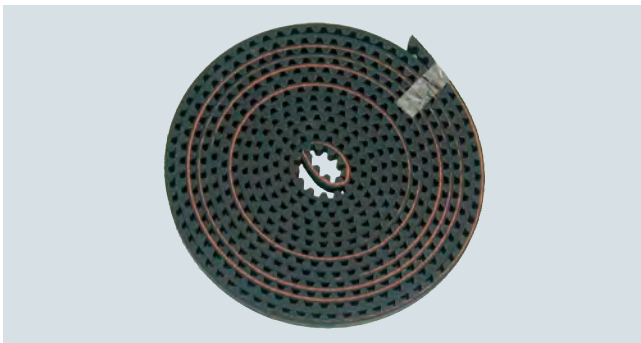
The door system is moved between the end positions of the door using the STS toothed belts. Two different toothed belt lengths can be ordered for each toothed belt width.

Toothed belt width 12 mm:

- Length 4 m: 6FB1104-0AT01-0AB0
- Length 45 m: 6FB1104-0AT02-0AB0

Toothed belt width 14 mm:

- Length 4 m: 6FB1104-0AT03-0AB0
- Length 55 m: 6FB1104-0AT04-0AB0



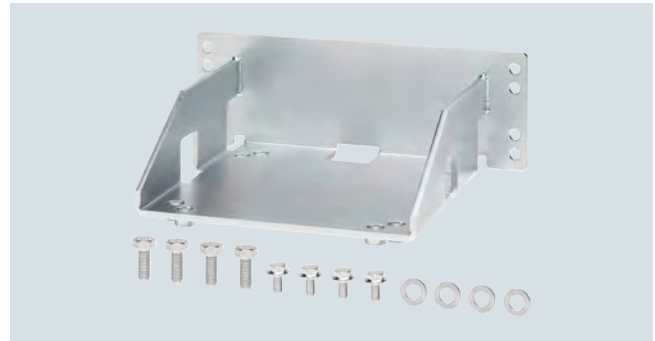
Toothed belt 6FB1104-0AT01-0AB0, length 4 m



Toothed belt 6FB1104-0AT02-0AB0, length 45 m

**A range of accessories is available for SIDOOR elevator door systems with EC technology:**

Motor holder 6FB1104-0AT03-0AD0 for accommodation of the SIDOOR MED280 direct drive.

Mounting bracket:

- For mounting the SIDOOR motor holder 6FB1104-0AT01-0AS0



- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (large) 6FB1104-0AT05-0AS4



SIDOOR mounting bracket, large

- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (small) 6FB1104-0AT05-0AS5



SIDOOR mounting bracket, small

## Products for specific requirements

Automatic door controls  
for elevators

### Accessories

#### Overview

##### Door clutch holder

- For attaching both ends of the toothed belt and connecting the respective door leaf to the toothed belt, width 20 mm 6FB1104-0AT05-0AS1



SIDOOR door clutch holder

##### STD toothed belt

As a connection between the door system and the end positions of the door

Toothed belt width 20 mm. Length 4 m 6FB1104-0AT05-0AB0



SIDOOR toothed belt, small

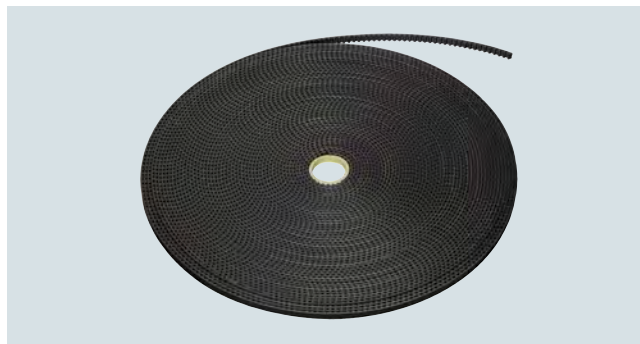
##### Deflector unit:

For attaching the SIDOOR toothed belt and fixing to the door 6FB1104-0AT07-0AS0



SIDOOR deflector unit

Toothed belt width 20 mm. Length 45 m 6FB1104-0AT06-0AB1



SIDOOR toothed belt, large

Ordering data	Article No.	Ordering data	Article No.
<b>Elevator door systems with geared motors</b>		<b>Elevator door systems with EC technology</b>	
<b>Rubber-metal anti-vibration mounts for geared motors</b>		<b>Motor holder for SIDOOR MED280 direct drive</b>	6FB1104-0AT03-0AD0
<ul style="list-style-type: none"> <li>SIDOOR rubber-metal anti-vibration mount for SIDOOR M2 and SIDOOR M3 geared motors</li> </ul>	6FB1104-0AT02-0AD0	<b>Mounting bracket for mounting the motor holder</b>	6FB1104-0AT01-0AS0
<ul style="list-style-type: none"> <li>SIDOOR rubber-metal anti-vibration mount for SIDOOR M4 and SIDOOR M5 geared motors</li> </ul>	6FB1104-0AT01-0AD0	<b>Mounting bracket with tensioning device for mounting the deflector unit</b>	
<b>Mounting bracket</b>		<ul style="list-style-type: none"> <li>Large</li> <li>Small</li> </ul>	6FB1104-0AT05-0AS4 6FB1104-0AT05-0AS5
<ul style="list-style-type: none"> <li>SIDOOR mounting bracket for geared motor</li> </ul>	6FB1104-0AT01-0AS0	<b>SIDOOR door clutch holder</b>	6FB1104-0AT05-0AS1
<ul style="list-style-type: none"> <li>SIDOOR mounting bracket with tensioning device for deflector pulley</li> </ul>	6FB1104-0AT02-0AS0	For toothed belt, width 20 mm	
<b>SIDOOR door clutch holder</b>		<b>SIDOOR deflector unit</b>	6FB1104-0AT07-0AS0
<ul style="list-style-type: none"> <li>For toothed belt, width 12 mm</li> <li>For toothed belt, width 14 mm</li> </ul>	6FB1104-0AT01-0CP0 6FB1104-0AT02-0CP0	<b>SIDOOR STD toothed belt</b>	
<b>SIDOOR deflector unit</b>	6FB1104-0AT03-0AS0	Width 20 mm	
<b>SIDOOR deflector roller for the STS toothed belt</b>	6FB1104-0AT04-0AS2	<ul style="list-style-type: none"> <li>4 m</li> <li>55 m</li> </ul>	6FB1104-0AT05-0AB0 6FB1104-0AT06-0AB1
<b>SIDOOR STS toothed belt</b>			
Width 12 mm			
<ul style="list-style-type: none"> <li>4 m</li> <li>45 m</li> </ul>	6FB1104-0AT01-0AB0 6FB1104-0AT02-0AB0		
<b>SIDOOR STS toothed belt</b>			
Width 14 mm			
<ul style="list-style-type: none"> <li>4 m</li> <li>55 m</li> </ul>	6FB1104-0AT03-0AB0 6FB1104-0AT04-0AB0		

## Products for specific requirements

### Automatic door controls

#### for industrial applications

##### Overview

The door drive system consists of a controller and a maintenance-free drive unit, the geared motors.

Control devices are electronic controllers connected to the power supply via an external power supply unit. They are generally connected to the higher-level controller via digital or fieldbus interfaces, and can be configured via a user interface.

These controllers are available for selection for industrial applications:

- SIDOOR ATD401W, digital I/O, masses of up to 700 kg
- SIDOOR ATD420W, connected to the higher-level controller via PROFIBUS interface, masses of up to 700 kg
- SIDOOR ATD430W, connected to the higher-level controller via PROFINET interface, masses of up to 700 kg

The safe functions – force limitation, energy limitation and end position detection – fulfill the requirements according to EN ISO 13849-1 for Category 2 and Performance Level d. The drives are suitable for power-operated guards according to EN ISO 14120

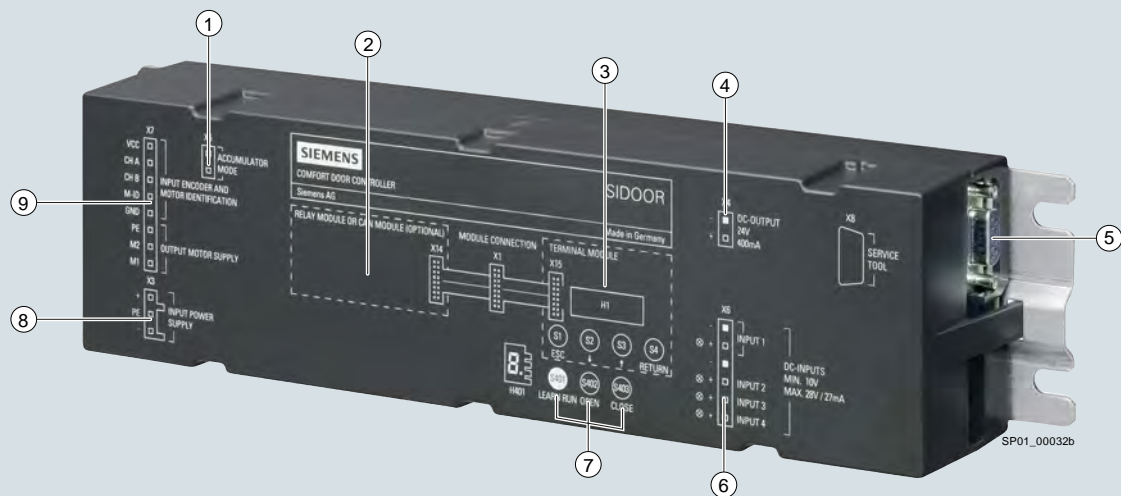
Geared motors form the maintenance-free drive unit in the door drive. The geared motors are DC motors with non-self-locking gearing, and are speed-controlled. The set force and speed limits are not exceeded.

Operation of the named door drives does not require limit switches. The door width and the "OPEN"/"CLOSE" positions are determined automatically.

The power is transmitted by a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with 2 door clutch holders. This enables it to drive both one-sided and centrally-opening doors. The accessories are not included in the scope of supply, see ["Additional units"](#).



## Overview



- |   |   |
|---|---|
| ① Digital input                                     | ⑥ Input signal connection   |
| ② Fieldbus interface                                | ⑦ Control panel   |
| ③ Terminal module                                   | ⑧ Input voltage connection<br>16.8 to 36 V DC<br>for connection of power supply |
| ④ Output voltage 24 V DC/400 mA connection          | ⑨ Motor connection  |
| ⑤ Connection<br>- Software Kit or<br>- Service Tool |   |

## SIDOOR ATD401W

The SIDOOR ATD401W enables the quick, easy and versatile installation, configuration and operation of a wide range of industrial door drive systems.

- Relay module design
- Masses of up to 700 kg
- Automatic determination of the door weight and friction during the learn run
- Digital inputs, for example for direct connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
- 3 relay outputs for position feedback and reversing feedback

- Operating temperature -20 to +50 °C
- Flexible motor management, automatic recognition of the geared motor
- Opening width 0.3 to 5 m
- Auxiliary voltage output 24 V DC  $\pm$  15%; 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit-proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or Service Tool

## Ordering data

## Article No.

## SIDOOR ATD401W

6FB1141-1AT11-3WE2

Control device, relay module design

## Products for specific requirements

Automatic door controls  
for industrial applications

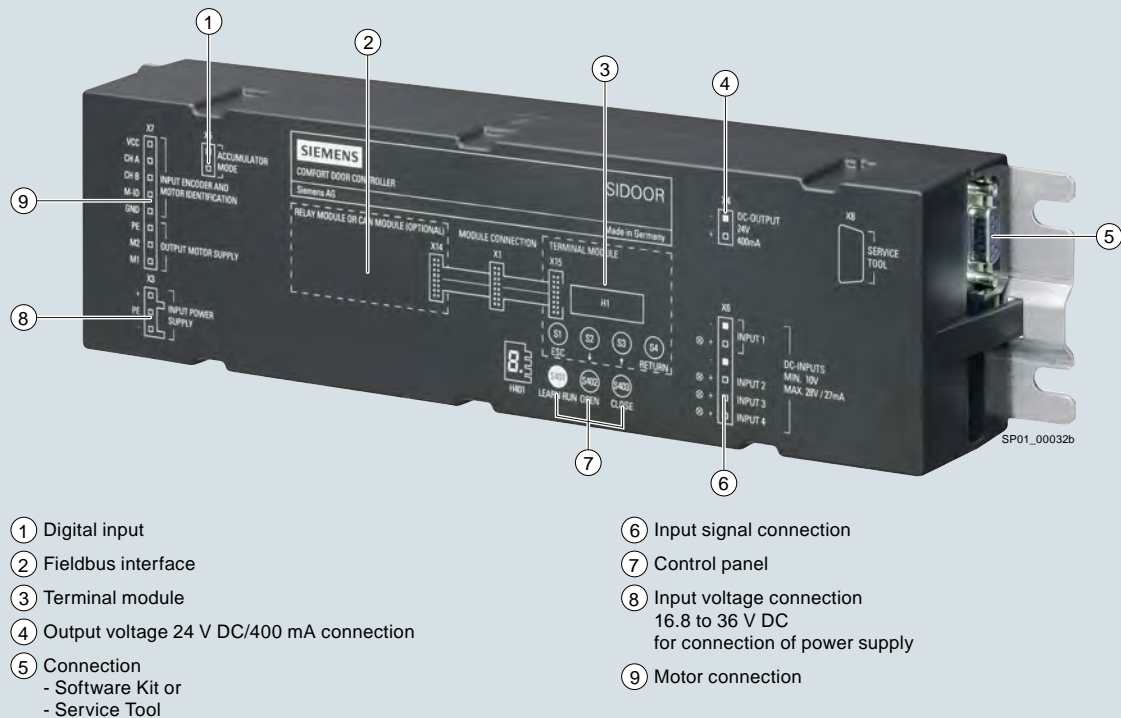
Control devices > SIDOOR ATD401W

### Technical specifications

Article number	<b>6FB1141-1AT11-3WE2</b> SIDOOR ATD401W
<b>Installation type/mounting</b>	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
<b>Supply voltage</b>	
Design of the power supply	Via SIDOOR TRANSFORMER / SIDOOR TRANSFORMER UL / NT40 / SITOP PSU8200 13 A, 36 V or via DC
Rated value (DC)	36 V
<b>Input current</b>	
I <sup>2</sup> t, min.	30 A <sup>2</sup> ·s
<b>Encoder supply</b>	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
<b>24 V encoder supply</b>	
• Output current, max.	400 mA
<b>Power</b>	
Active power input	145 W
Active power input, max.	540 W
Active power input (standby mode)	5 W
<b>Digital inputs</b>	
Control inputs isolated	Yes
Control inputs p-switching	Yes
<b>Input voltage</b>	
• for signal *0*, min.	-3 V
• for signal *0*, max.	5 V
• for signal *1*, min.	10 V
• for signal *1*, max.	28 V
<b>Input current</b>	
• for signal *1*, min.	9 mA
• for signal *1*, max.	27 mA
<b>Digital outputs</b>	
<b>Relay outputs</b>	
<b>Switching capacity of contacts</b>	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	1 A

Article number	<b>6FB1141-1AT11-3WE2</b> SIDOOR ATD401W
<b>Mechanical data</b>	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J
<b>Interfaces</b>	
Interfaces/bus type	without
<b>Standards, approvals, certificates</b>	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Standard for safety	EN 61010-1 / EN 61010-2-201 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	50 °C
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• No condensation, min.	10 %
• No condensation, max.	93 %
<b>Dimensions</b>	
Width	320 mm
Height	60 mm
Depth	80 mm

## Overview



SIDOOR ATD420W

The SIDOOR ATD420W can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD420W controller offers complete flexibility for integration with a machine tool via PROFIBUS

- Masses of up to 700 kg
- Integrated PROFIBUS interface
- 5 freely parameterizable digital inputs for signal acquisition, of which one input is optionally parameterizable for:
  - Connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connection of a pressure-sensitive edge according to ISO 13856-2
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run
- Parameter assignment and analysis of the door parameters via PROFIDrive

- Operating temperature -20 to +50 °C
- Flexible motor management, i.e. automatic recognition of the geared motor
- Assisted drive (motor-assisted movement of the door)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC  $\pm 15\%$  and 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or Service Tool

## Ordering data

## Article No.

## SIDOOR ATD420W

6FB1141-2AT10-3WE2

Control device, integrated  
PROFIBUS interface

## Products for specific requirements

Automatic door controls  
for industrial applications

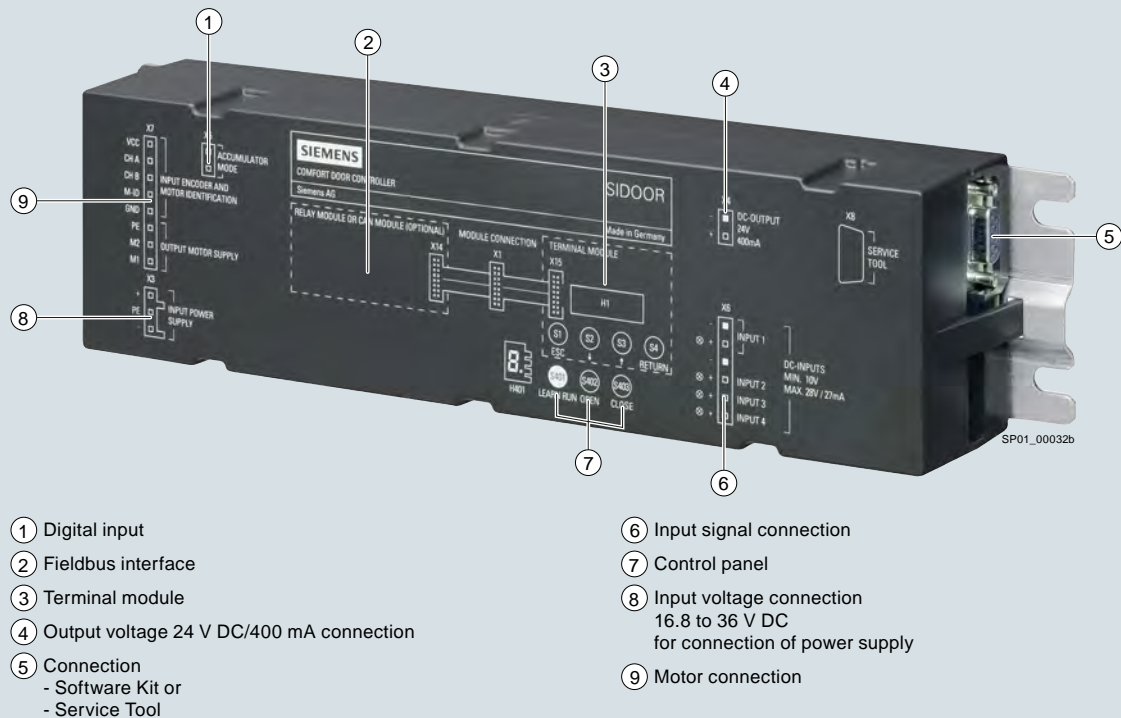
Control devices > SIDOOR ATD420W

### Technical specifications

Article number	<b>6FB1141-2AT10-3WE2</b> SIDOOR ATD420W
<b>Installation type/mounting</b>	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
<b>Supply voltage</b>	
Design of the power supply	Via SIDOOR TRANSFORMER / SIDOOR TRANSFORMER UL / NT40 / SITOP PSU8200 13 A, 36 V or via DC
Rated value (DC)	36 V
<b>Input current</b>	
I <sup>2</sup> t, min.	30 A <sup>2</sup> ·s
<b>Encoder supply</b>	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
<b>24 V encoder supply</b>	
• Output current, max.	400 mA
<b>Power</b>	
Active power input	145 W
Active power input, max.	540 W
Active power input (standby mode)	5 W
<b>Digital inputs</b>	
Control inputs isolated	Yes
Control inputs p-switching	Yes
<b>Input voltage</b>	
• for signal *0*, min.	-3 V
• for signal *0*, max.	5 V
• for signal *1*, min.	10 V
• for signal *1*, max.	28 V
<b>Input current</b>	
• for signal *1*, min.	9 mA
• for signal *1*, max.	27 mA
<b>Digital outputs</b>	
<b>Relay outputs</b>	
<b>Switching capacity of contacts</b>	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	0.5 A

Article number	<b>6FB1141-2AT10-3WE2</b> SIDOOR ATD420W
<b>Mechanical data</b>	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J
<b>Interfaces</b>	
Interfaces/bus type	PROFIBUS according to IEC 61784-3
Number of bus nodes	32
<b>Standards, approvals, certificates</b>	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
PNO certificate	Yes
China RoHS compliance	Yes
Standard for safety	EN 61010-1 / EN 61010-2-201 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	50 °C
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• No condensation, min.	10 %
• No condensation, max.	93 %
<b>Dimensions</b>	
Width	320 mm
Height	60 mm
Depth	80 mm

## Overview



## SIDOOR ATD430W

The SIDOOR ATD430W machine tool door drive can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD430W controller offers complete flexibility for integration into a machine tool via PROFINET.

- Masses of up to 700 kg
- Integrated PROFINET interface (2 RJ45 ports)
- 5 freely parameterizable digital inputs for signal acquisition, of which one input is optionally parameterizable for:
  - Connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connecting a pressure-sensitive edge according to ISO 13856-22, relay contacts for additional position signals
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run

- Parameter assignment and analysis of the door parameters
- Operating temperature -20 to +50 °C
- Flexible motor management, i.e. automatic recognition of the geared motor
- Assisted drive (motor-assisted movement of the door)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC  $\pm 15\%$  and 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit-proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or Service Tool

## Ordering data

## Article No.

## SIDOOR ATD430W

6FB1141-3AT10-3WE2

Control device, integrated  
PROFINET interface (2 RJ45 ports)

## Products for specific requirements

Automatic door controls  
for industrial applications

Control devices > SIDOOR ATD430W

### Technical specifications

Article number	<b>6FB1141-3AT10-3WE2</b> SIDOOR ATD430W
<b>Installation type/mounting</b>	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
<b>Supply voltage</b>	
Design of the power supply	Via SIDOOR TRANSFORMER / SIDOOR TRANSFORMER UL / NT40 / SITOP PSU8200 13 A, 36 V or via DC
Rated value (DC)	36 V
<b>Input current</b>	
I <sup>2</sup> t, min.	30 A <sup>2</sup> ·s
<b>Encoder supply</b>	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
<b>24 V encoder supply</b>	
• Output current, max.	400 mA
<b>Power</b>	
Active power input	145 W
Active power input, max.	540 W
Active power input (standby mode)	5 W
<b>Digital inputs</b>	
Control inputs isolated	Yes
Control inputs p-switching	Yes
<b>Input voltage</b>	
• for signal *0*, min.	-3 V
• for signal *0*, max.	5 V
• for signal *1*, min.	10 V
• for signal *1*, max.	28 V
<b>Input current</b>	
• for signal *1*, min.	9 mA
• for signal *1*, max.	27 mA
<b>Digital outputs</b>	
<b>Relay outputs</b>	
<b>Switching capacity of contacts</b>	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	0.5 A
<b>Mechanical data</b>	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J

Article number	<b>6FB1141-3AT10-3WE2</b> SIDOOR ATD430W
<b>Interfaces</b>	
Interfaces/bus type	PROFINET IO according to Conformance Class C
<b>Standards, approvals, certificates</b>	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
PNO certificate	Yes
China RoHS compliance	Yes
Standard for safety	EN 61010-1 / EN 61010-2-201 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	50 °C
• Remark	Screw control device thermally conductive onto a metallic mounting surface or standard rail mounting, otherwise the maximum operating temperature is only 40 °C
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• No condensation, min.	10 %
• No condensation, max.	93 %
<b>Dimensions</b>	
Width	320 mm
Height	60 mm
Depth	80 mm

**Overview**

The power supplies can be used for the various SIDOOR controllers:

SIDOOR Transformer and Transformer UL power supply units:  
For masses of up to 400 kg and moderate performance.

- SIDOOR AT40 and ATE500E elevator door drives
- SIDOOR ATD4xxW machine tool door drives
- SIDOOR ATE53xS platform screen door drives

SIDOOR NT40 switched-mode power supply:  
For masses of up to 600 kg and maximum performance.

- SIDOOR AT40 and ATE500E elevator door drives
- SIDOOR ATD4xxW machine tool door drives

SITOP PSU8200 3-phase stabilized power supply,  
36 V DC/13 A:

For masses of up to 700 kg and maximum performance.

- SIDOOR ATD4xxW machine tool door drives

**Overview Power supply unit**

SIDOOR Transformer

The SIDOOR TRANSFORMER and SIDOOR TRANSFORMER UL are standard power supply units operated with 220-240 V AC, 50/60 Hz, from the SIDOOR product range. They can be used for controllers capable of controlling masses of up to 400 kg.

Further information [see page 14/17](#).

**Overview Switched-mode power supply**

The SIDOOR NT40 switched-mode power supply unit is operated with 230 V AC ( $\pm 15\%$ ), 50/60 Hz, to power the elevator door controllers.

It is especially suitable for door systems with high door weights.

On the output side, the power supply unit delivers a voltage of 36 V DC ( $\pm 3\%$ ) SELV at a rated output power of < 100 W.

In order to enable fast acceleration/deceleration of the doors by the controller, the device can briefly (< 2 s) deliver a current of 15 A (corresponds to a short-time power output of 540 W).

Further information [see page 14/19](#).

## Products for specific requirements

Automatic door controls  
for industrial applications

Power supplies > 3-phase, 36 V DC

### Overview



The 3-phase SITOP PSU8200 are technology power supplies for challenging solutions. The wide-range input allows a connection to almost any electricity supply network worldwide and ensures a high degree of safety even if there are large voltage fluctuations.

To further increase 36 V availability, SITOP power supplies can be combined with redundancy modules.

#### Product highlights

- 3-phase, 36 V DC / 13 A
- Input voltage 320 ... 575 V AC
- Up to 94% efficiency
- cULus, cCSAus, ABS and DNV GL certifications

### Ordering data

#### Article No.

Ordering data	Article No.
<b>SITOP PSU8200 3-phase, 36 V DC/13 A</b>	<b>6EP3446-8SB10-0AY0</b>
Stabilized power supply Input: 400 ... 500 V 3 AC Output: 36 V DC/13 A	
<b>Add-on modules</b>	
<b>SITOP redundancy modules RED1200<sup>1)</sup></b>	
<b>Accessories</b>	
<b>Unit labeling plate</b>	<b>3RT2900-1SB20</b>

<sup>1)</sup> For more information, visit:  
<https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10049983?tree=CatalogTree>

### Technical specifications

Article number	<b>6EP3446-8SB10-0AY0</b>
Product	SITOP PSU8200
Power supply, type	36 V/13 A
<b>Input</b>	
Input	3-phase AC
Rated voltage value $V_{in}$ rated	400 ... 500 V
Voltage range AC	320 ... 575 V
Wide-range input	Yes
Mains buffering	at $V_{in} = 400$ V
Mains buffering at $I_{out}$ rated, min.	15 ms; at $V_{in} = 400$ V
Rated line frequency 1	50 Hz
Rated line frequency 2	60 Hz
Rated line range	47 ... 63 Hz
input current	
• at rated input voltage 400 V	1.2 A
• at rated input voltage 500 V	1 A
Switch-on current limiting (+25 °C), max.	16 A
$I^2t$ , max.	0.8 A <sup>2</sup> ·s
Built-in incoming fuse	none
Protection in the mains power input (IEC 898)	Required: 3-pole connected miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)
<b>Output</b>	
Output	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	36 V
• output voltage at output 1 at DC rated value	36 V
Total tolerance, static $\pm$	3 %
Static mains compensation, approx.	0.1 %
Static load balancing, approx.	0.2 %
Residual ripple peak-peak, max.	100 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	200 mV
Adjustment range	36 ... 42 V
product function output voltage adjustable	Yes
Output voltage setting	via potentiometer; max. 480 W
Status display	Green LED for 36 V OK
Signaling	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for 36 V OK
On/off behavior	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	2.5 s
voltage increase time of the output voltage maximum	500 ms
Rated current value $I_{out}$ rated	13 A
Current range	0 ... 13 A
• Note	+60 ... +70 °C: Derating 2%/K
supplied active power typical	468 W
short-term overload current	
• at short-circuit during operation typical	39 A
duration of overloading capability for excess current	
• at short-circuit during operation	25 ms
constant overload current	
• on short-circuiting during the start-up typical	14 A



### Technical specifications

Article number	<b>6EP3446-8SB10-0AY0</b>
Product	SITOP PSU8200
Power supply, type	36 V/13 A
Parallel switching for enhanced performance	Yes; switchable characteristic
Numbers of parallel switchable units for enhanced performance	2
<b>Efficiency</b>	
Efficiency at V <sub>out</sub> rated, I <sub>out</sub> rated, approx.	94 %
Power loss at V <sub>out</sub> rated, I <sub>out</sub> rated, approx.	30 W
<b>Closed-loop control</b>	
Dynamic mains compensation (V <sub>in</sub> rated ±15 %), max.	0.1 %
Dynamic load smoothing (I <sub>out</sub> : 50/100/50 %), U <sub>out</sub> ± typ.	1 %
Load step setting time 50 to 100%, typ.	0.2 ms
Load step setting time 100 to 50%, typ.	0.2 ms
Dynamic load smoothing (I <sub>out</sub> : 10/90/10 %), U <sub>out</sub> ± typ.	2 %
Load step setting time 10 to 90%, typ.	0.2 ms
Load step setting time 90 to 10%, typ.	0.2 ms
setting time maximum	10 ms
<b>Protection and monitoring</b>	
Output overvoltage protection	< 48 V
Current limitation, typ.	14 A
property of the output short-circuit proof	Yes
Short-circuit protection	Alternatively, constant current characteristic approx. 14 A or latching shutdown
enduring short circuit current RMS value	
• typical	14 A
overcurrent overload capability in normal operation	overload capability 150 % I <sub>out</sub> rated up to 5 s/min
Overload/short-circuit indicator	LED yellow for "overload", LED red for "latching shutdown"
<b>Safety</b>	
Primary/secondary isolation	Yes
galvanic isolation	Safety extra low output voltage V <sub>out</sub> according to EN 60950-1
Protection class	Class I
leakage current	
• maximum	3.5 mA
• typical	0.9 mA
Degree of protection (EN 60529)	IP20
<b>Approvals</b>	
CE mark	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
Explosion protection	IECEX Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4
certificate of suitability NEC Class 2	No
FM approval	-
CB approval	Yes
certificate of suitability EAC approval	Yes
Marine approval	DNV GL

Article number	<b>6EP3446-8SB10-0AY0</b>
Product	SITOP PSU8200
Power supply, type	36 V/13 A
<b>EMC</b>	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
<b>environmental conditions</b>	
ambient temperature	
• during operation	-25 ... +70 °C
- Note	with natural convection
• during transport	-40 ... +85 °C
• during storage	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, 5 ... 95% no condensation
<b>Mechanics</b>	
Connection technology	screw-type terminals
Connections	
• Supply input	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 2 screw terminals each for 0.2 ... 4 mm <sup>2</sup>
• Auxiliary	13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm <sup>2</sup> ; 15, 16 (Remote): 1 screw terminal each for 0.14 ... 1.5 mm <sup>2</sup>
width of the enclosure	70 mm
height of the enclosure	125 mm
depth of the enclosure	125 mm
required spacing	
• top	50 mm
• bottom	50 mm
• left	0 mm
• right	0 mm
Weight, approx.	1.2 kg
product feature of the enclosure housing can be lined up	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15
mechanical accessories	Device identification label 20 mm × 7 mm, T1-grey 3RT2900-1SB20
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

## Products for specific requirements

Automatic door controls  
for industrial applications

Additional units > Software Kit, Service Tool

### Overview Software Kit



SIDOOR Software Kit

The scope of delivery of the SIDOOR Software Kit includes an installation CD.

The CD includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

#### Note:

Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

### Ordering data

### Article No.

<b>SIDOOR Software Kit</b>	<b>6FB1105-0AT01-6SW0</b>
----------------------------	---------------------------

### Overview Service Tool



The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

The Service Tool is connected to the various controllers by the respective cable.

You do not need to open the cover of the controller to do this.

#### Note:

If the Service Tool is in the "Quick adjustment" or "Total adjustment" menu, the run commands of the controller are blocked via the command inputs.

### Ordering data

### Article No.

#### SIDOOR Service Tool, hand-held terminal

for parameter assignment of control devices

**6FB1105-0AT01-6ST0**

## Overview

The SIDOOR geared motor is a combination of a gear unit, motor and incremental encoder matched to the complete system. It is easy to connect to the controller via the interface provided, and is automatically detected during commissioning.

The maintenance-free, variable speed drive unit comprises a DC motor with non-self-locking gearing. All geared motors are available with the output shaft on the left or right. The view is toward the front of the gear unit.

The "mass to be moved" has to be taken into account when selecting the geared motor:

The weight to be moved is calculated from the sum of the mass equivalent of the moment of inertia of the motor rotor, the moved door weight and the moved door mechanism weight. The weight of the door to be moved and the moved weight of the door mechanism depend on the application. You can find additional information in the system manual.

The **output shaft** is appropriately prepared for the mechanical coupling of the door.

- SIDOOR M3, M4 and M5 Basic motors: Output gear with 56 mm effective diameter for the use of a S8M toothed belt (see Accessories).
- Advanced motors: Gearbox output shaft with groove and feather key A 5x5 according to DIN 6885; the output gear design and effective diameter can be freely configured between 28 mm and 122 mm. Advanced motors are recommended, among other things, for a mechanical coupling to the door via gear rack or chain.

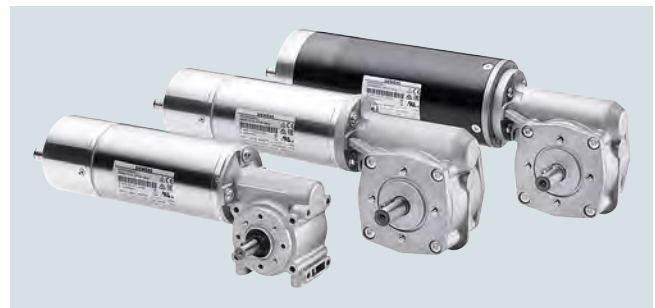
### Advanced motors:

SIDOOR MDG3 L	6FB1103-0AT14-4MB1
SIDOOR MDG3 R	6FB1103-0AT13-4MB1
SIDOOR MDG4 L	6FB1103-0AT14-3MG2
SIDOOR MDG4 R	6FB1103-0AT13-3MG2
SIDOOR MDG5 L	6FB1103-0AT14-3MG2
SIDOOR MDG5 R	6FB1103-0AT13-3MG2

Version	Advanced motors			Basic motors		
<b>SIDOOR designation</b>	MDG3	MDG4	MDG5	M3	M4	M5
<b>Maximum mass to be moved</b>	180 kg	400 kg	700 kg	180 kg	400 kg	600 kg
<b>Connection to door controller</b>	via SIDOOR MDG CABLE (see Accessories)			Connecting cable permanently integrated with the geared motor, cable length 1.5 m		
<b>Degree of protection</b>	IP56			IP40	IP54	
<b>Design of output shaft</b>	Gearbox output shaft with groove and feather key, optional output gear for S8M toothed belt available (see Accessories)			Fixed, pressed-on output gear for S8M toothed belt (see Accessories)		



SIDOOR M3 L to SIDOOR M5 L geared motors for automatic door control



SIDOOR MDG3 L, MDG4 L and MDG5 L

## Products for specific requirements

Automatic door controls  
for industrial applications

### Geared motors

Ordering data	Article No.	Ordering data	Article No.
<b>SIDOOR M3 geared motors</b>		<b>SIDOOR MDG3 geared motors</b>	
M3 L	6FB1103-0AT10-4MB0	MDG3 L	6FB1103-0AT14-4MB1
M3 R	6FB1103-0AT11-4MB0	MDG3 R	6FB1103-0AT13-4MB1
<b>SIDOOR M4 geared motors</b>		<b>SIDOOR MDG4 geared motor</b>	
M4 L	6FB1103-0AT10-3MC0	MDG4 L	6FB1103-0AT14-3MC2
M4 R	6FB1103-0AT11-3MC0	MDG4 R	6FB1103-0AT13-3MC2
<b>SIDOOR M5 geared motors</b>		<b>SIDOOR MDG5 geared motor</b>	
M5 L	6FB1103-0AT10-3MD0	MDG5 L	6FB1103-0AT14-3MG2
M5 R	6FB1103-0AT11-3MD0	MDG5 R	6FB1103-0AT13-3MG2

### Technical specifications

Article number	6FB1103-0AT10-4MB0	6FB1103-0AT11-4MB0	6FB1103-0AT10-3MC0	6FB1103-0AT11-3MC0	6FB1103-0AT10-3MD0	6FB1103-0AT11-3MD0
	SIDOOR M3 L	SIDOOR M3 R	SIDOOR M4 L	SIDOOR M4 R	SIDOOR M5 L	SIDOOR M5 R
<b>Supply voltage</b>						
Rated value (DC)	30 V					
<b>Input current</b>						
Operational current (rated value)	4 A			7.5 A		
<b>Power</b>						
Active power input	120 W			225 W		
<b>Mechanical data</b>						
Torque of the rotary operating mechanism (rated value)	3 N·m			6.8 N·m		
Speed, max.	0.65 m/s		0.75 m/s		0.5 m/s	
Gear ratio	15					
Number of pulses per revolution, max.	100					
Weight of door, max.	180 kg			400 kg		600 kg
<b>Standards, approvals, certificates</b>						
CE mark	Yes					
UL approval	Yes					
EAC (formerly Gost-R)	Yes					
TÜV Inspectorate approval	Yes					
China RoHS compliance	Yes					
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• min.	-20 °C					
• max.	50 °C					
<b>Ambient temperature during storage/transportation</b>						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					
<b>Dimensions</b>						
Height of motor	98 mm		115 mm		124 mm	
Length of motor	236 mm		275 mm		344 mm	
Diameter of motor	63 mm					
Width of gear unit, including drive pinion	85 mm			105 mm		111 mm

## Technical specifications

Article number	6FB1103-0AT14-4MB1	6FB1103-0AT13-4MB1	6FB1103-0AT14-3MC2	6FB1103-0AT13-3MC2	6FB1103-0AT14-3MG2	6FB1103-0AT13-3MG2
	SIDOOR MDG3 L	SIDOOR MDG3 R	SIDOOR MDG4 L	SIDOOR MDG4 R	SIDOOR MDG5 L	SIDOOR MDG5 R
<b>General information</b>						
Product type designation	MDG3 L	MDG3 R	MDG4 L	MDG4 R	MDG5 L	MDG5 R
<b>Supply voltage</b>						
Rated value (DC)	30 V					
<b>Input current</b>						
Operational current (rated value)	4 A				7.5 A	
<b>Power</b>						
Active power input	120 W				225 W	
<b>Mechanical data</b>						
Torque of the rotary operating mechanism (rated value)	3 N·m				6 N·m	
Speed, max.	0.65 m/s		0.75 m/s		0.5 m/s	
Mass to be moved, max.	180 kg		400 kg		700 kg	
Gear unit	Yes					
Gear ratio	15					
Number of pulses per revolution, max.	100					
Fixed output gear	No					
<b>Standards, approvals, certificates</b>						
CE mark	Yes					
UL approval	Yes					
EAC (formerly Gost-R)	Yes					
China RoHS compliance	Yes					
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• min.	-20 °C					
• max.	50 °C					
<b>Ambient temperature during storage/transportation</b>						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					
<b>Cables</b>						
Fixed connecting cable	No					
<b>Dimensions</b>						
Diameter of output gear, min.	28 mm					
Diameter of output gear, max.	122 mm					
Height of motor	98 mm		115 mm		124 mm	
Length of motor	264 mm		303 mm		348 mm	
Diameter of motor	63 mm				80 mm	
Width of gearbox	85 mm		106 mm		109 mm	

## Products for specific requirements

Automatic door controls  
for industrial applications

### Accessories

#### Overview

An extensive range of accessories is available for the door control drives.

This is necessary to ensure low-noise operation of the door leaves by the motor. The geared motors can be optimally integrated into the respective door drive system.

#### Accessories for all controllers for industrial applications

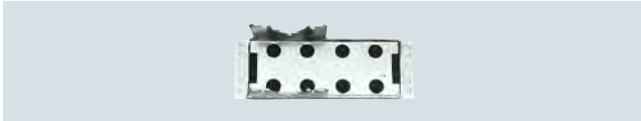
##### Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR M3 and SIDOOR MDG3 geared motors
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for SIDOOR M4 and MDG4 as well as SIDOOR M5 and MDG5 geared motors



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for geared motors with masses to be moved of up to 180 kg



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for geared motors with masses of up to 700 kg

#### Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for mounting SIDOOR geared motors, for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit. For setting the toothed belt to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

#### Mounting rail holder

The standard mounting rail holder 6FB1144-0AT00-3SA0 is available for mounting controllers on the TH 35 standard mounting rail according to IEC 60715.

#### Door clutch holder

The door clutch holder serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

A door clutch holder is available for each toothed belt width:

- Width 12 mm: 6FB1104-0AT01-0CP0
- Width 14 mm: 6FB1104-0AT02-0CP0



Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

#### Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system. The STS toothed belt is redirected via this deflector unit.

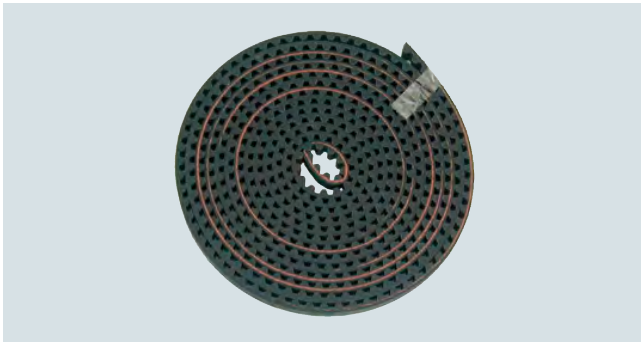


Deflector unit 6FB1104-0AT03-0AS0

**Overview**STS toothed belt

The door system is moved between the end positions of the door using the STS toothed belts. Two different toothed belt lengths can be ordered for each toothed belt width.

- Toothed belt width 12 mm:
  - Length 4 m: 6FB1104-0AT01-0AB0
  - Length 45 m: 6FB1104-0AT02-0AB0
- Toothed belt width 14 mm:
  - Length 4 m: 6FB1104-0AT03-0AB0
  - Length 55 m: 6FB1104-0AT04-0AB0



Toothed belt 6FB1104-0AT01-0AB0 (width 12 mm, length 4 m)

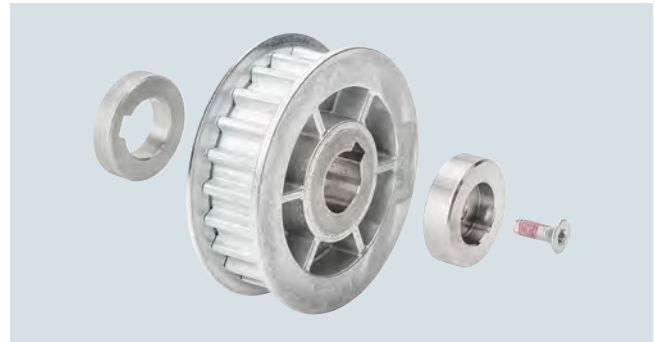


Toothed belt 6FB1104-0AT02-0AB0 (width 12 mm, length 45 m)

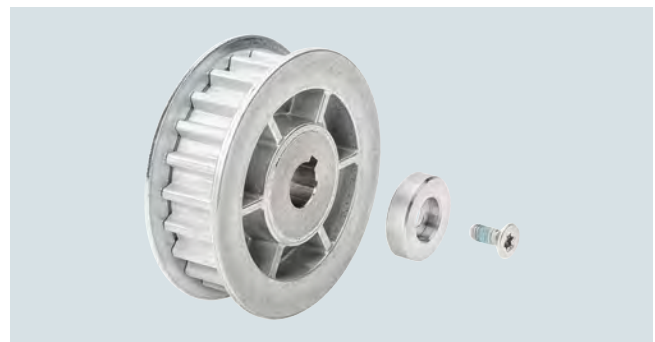
MDG-PULLEY belt pulley

This belt pulley is used for DC geared motors with the S8M toothed belt with an effective diameter of 56 mm.

- for SIDOOR MDG4, MDG5 DC geared motors: 6FB1104-0AT14-0AS1
- for SIDOOR MDG3 DC geared motors: 6FB1104-0AT10-0AS1



SIDOOR MDG-PULLEY 14-S8M-56, 6FB1104-0AT14-0AS1



SIDOOR MDG-PULLEY 10-S8M-56, 6FB1104-0AT10-0AS1

Accessories for machine tool door drives onlySIDOOR MDG-CABLE cable set

This cable set connects the ATD4xxW door controller to the SIDOOR MDG3, MDG 4 and MDG 5 geared motors. Various lengths are available.

- Length 5 m: 6FB1104-0AT05-0CB2
- Length 10 m: 6FB1104-0AT10-0CB2
- Length 15 m: 6FB1104-0AT15-0CB2
- Length 20 m: 6FB1104-0AT20-0CB2

## Products for specific requirements

Automatic door controls  
for industrial applications

### Accessories

Ordering data	Article No.		Article No.
<b>Rubber-metal anti-vibration mounts for geared motors</b> <ul style="list-style-type: none"> <li>SIDOOR rubber-metal anti-vibration mount for geared motors with masses of up to 180 kg</li> <li>SIDOOR rubber-metal anti-vibration mount for geared motors with masses of up to 700 kg</li> </ul>	<b>6FB1104-0AT02-0AD0</b>  <b>6FB1104-0AT01-0AD0</b>	<b>SIDOOR STS toothed belt</b> Width 14 mm <ul style="list-style-type: none"> <li>4 m</li> <li>55 m</li> </ul>	<b>6FB1104-0AT03-0AB0</b> <b>6FB1104-0AT04-0AB0</b>
<b>Mounting bracket</b> <ul style="list-style-type: none"> <li>SIDOOR mounting bracket for geared motor</li> <li>SIDOOR mounting bracket with tensioning device for deflector pulley</li> </ul>	<b>6FB1104-0AT01-0AS0</b>  <b>6FB1104-0AT02-0AS0</b>	<b>For industrial applications only</b> <b>SIDOOR MDG-CABLE cable set</b> <ul style="list-style-type: none"> <li>5 m</li> <li>10 m</li> <li>15 m</li> <li>20 m</li> </ul>	<b>6FB1104-0AT05-0CB2</b> <b>6FB1104-0AT10-0CB2</b> <b>6FB1104-0AT15-0CB2</b> <b>6FB1104-0AT20-0CB2</b>
<b>DIN rail holder</b> For mounting control devices on the standard DIN rail TH 35	<b>6FB1144-0AT00-3AS0</b>	<b>SIDOOR door clutch holder</b> <ul style="list-style-type: none"> <li>For toothed belt, width 14 mm</li> </ul>	<b>6FB1104-0AT02-0CP0</b>
<b>SIDOOR door clutch holder</b> <ul style="list-style-type: none"> <li>For toothed belt width of 12 mm</li> </ul>	<b>6FB1104-0AT01-0CP0</b>	<b>SIDOOR MDG-PULLEY</b> <ul style="list-style-type: none"> <li>SIDOOR MDG-PULLEY 14-S8M-56 belt pulley for MDG4 and MDG5 DC geared motors and S8M toothed belt, effective diameter 56 mm</li> <li>SIDOOR MDG-PULLEY 10-S8M-56, belt pulley for MDG3 DC geared motor and S8M toothed belt, effective diameter 56 mm</li> </ul>	<b>6FB1104-0AT14-0AS1</b>  <b>6FB1104-0AT10-0AS1</b>
<b>SIDOOR deflector unit</b>	<b>6FB1104-0AT03-0AS0</b>		
<b>SIDOOR STS toothed belt</b> Width 12 mm <ul style="list-style-type: none"> <li>4 m</li> <li>45 m</li> </ul>	<b>6FB1104-0AT01-0AB0</b> <b>6FB1104-0AT02-0AB0</b>		



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**Overview**

The product-specific application/requirement lies in complying with the special railway requirements concerning functional safety.

Interior railway doors have a closing spring which must always bring the door into the "CLOSED" position. This applies to either side, even when a train car is inclined at 10°.

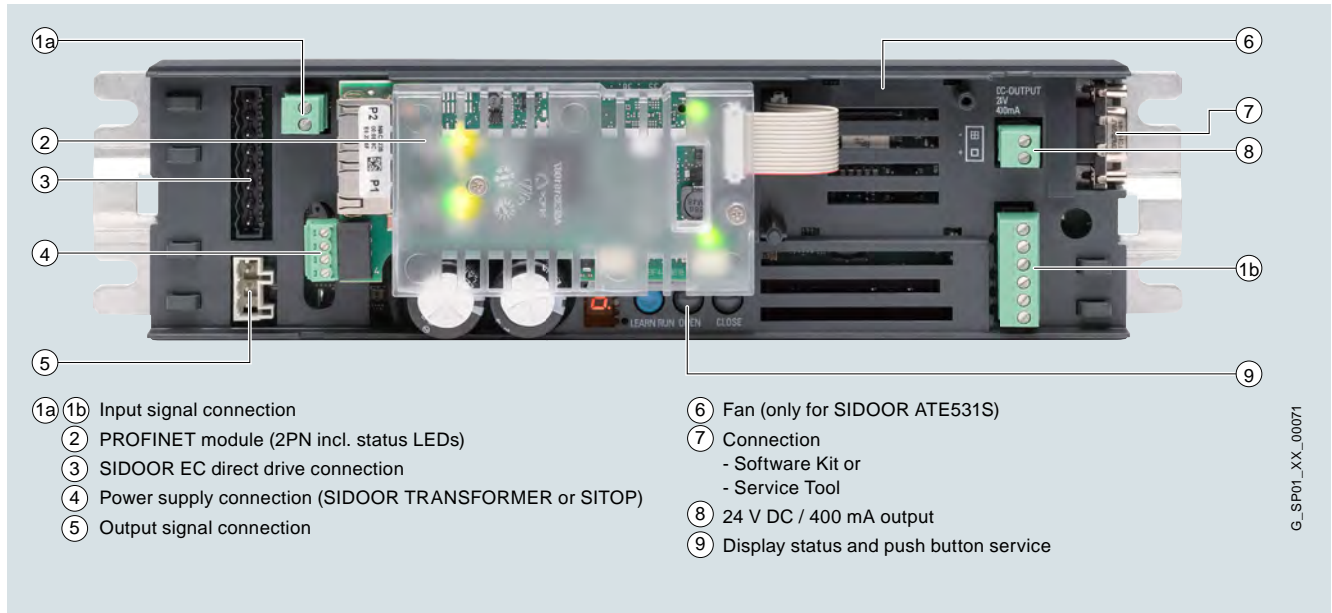
These specific operating states are handled by the door controller.

## Products for specific requirements

Automatic door controls  
for railway applications

Control devices > Platform screen door drive

### Overview



SIDOOR ATE530S/531S wiring diagram

The SIDOOR ATE53xS door controller is an “intelligent” door drive which can be used for safety-oriented operation of platform screen doors (PSD) according to individual requirements. Siemens has once again shown just how easy integration can be with the innovative SIDOOR ATE53xS platform screen door drive in conjunction with SIDOOR MED280 or MEG251 motors. The PROFINET module integrated in the SIDOOR ATE53xS enables standardized, certified connection to PROFINET IO systems.

- Use of standard automation components
- Full integration into TIA Portal and STEP 7 thanks to PROFINET connection
- Parameter assignment and monitoring of door control parameters via the PROFINET interface (function blocks available as example applications in SIOS).

- Application example:  
Synchronization of two-panel and independent platform screen doors with SIDOOR ATE530S PROFINET EC door drive and S7-1500 CPU via TIA Portal  
<https://support.industry.siemens.com/cs/ww/en/view/109480495>
- Application example:  
Safety-oriented automation of platform screen doors with SIDOOR ATE530S PROFINET EC door drive and S7-1500 CPU via TIA Portal  
<https://support.industry.siemens.com/cs/ww/en/view/109477186>
- Read-in of two safe signals (two-channel, antivalent)
- High level of system safety thanks to safe torque off (e.g. self-release in the event of a fault)
- Firmware update for all SIDOOR controllers on an entire platform possible centrally via TCP/IP
- SIL 2 according to IEC 62061

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### Ordering data

#### SIDOOR ATE530S Platform screen door drive

SIDOOR ATE530S coated,  
version with protective coating

### Article No.

**6FB1231-3BM12-7AT0**

#### SIDOOR ATE531S Platform screen door drive

SIDOOR ATE531S, version with  
protective coating and extended  
temperature range

### Article No.

**6FB1231-3BM11-7AT0**

**Technical specifications**

Article number	6FB1231-3BM12-7AT0 SIDOOR ATE530S COATED	6FB1231-3BM11-7AT0 SIDOOR ATE531S
<b>General information</b>		
Product type designation		ATE531S
Mean time between failures (MTBF)	13 y	
<b>Installation type/mounting</b>		
Installation and mounting instructions	No direct exposure to the sun	
<b>Supply voltage</b>		
Design of the power supply	Via SIDOOR TRANSFORMER or via DC	
Rated value (DC)	36 V; with MED280: at 24 V DC max. door speed of 500 mm/s, at 28.8 V DC max. door speed of 800 mm/s. With MEG251: at 24 V DC max. door speed of 500 mm/s, at 28.8 V DC max. door speed of 750 mm/s	
<b>Encoder supply</b>		
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!	
short-circuit proof	Yes	
Overload-proof	Yes	
<b>24 V encoder supply</b>		
• Output current, max.	400 mA	
<b>Power</b>		
Active power input	80 W	
Active power input, max.	540 W	
Active power input (standby mode)	7 W	
<b>Digital inputs</b>		
Control inputs isolated	Yes	
Control inputs p-switching	Yes	
<b>Input voltage</b>		
• for signal *0*, min.	-3 V	
• for signal *0*, max.	5 V	
• for signal *1*, min.	10 V	
• for signal *1*, max.	28 V	
<b>Input current</b>		
• for signal *1*, min.	3 mA	
• for signal *1*, max.	15 mA	
<b>Digital outputs</b>		
<b>Relay outputs</b>		
<b>Switching capacity of contacts</b>		
- at 30 V DC, min.	0.01 A	
- at 30 V DC, max.	0.5 A	
<b>Mechanical data</b>		
Opening width of door, min.	0.35 m	
Opening width of door, max.	5 m	
Weight of door, max.	280 kg	
Operating cycle frequency of door, max.	180 1/h	
Kinetic energy, max.	75 J	
<b>Interfaces</b>		
Interfaces/bus type	PROFINET according to Conformance Class A, B, C; integrated switch for linear and ring structure	

## Products for specific requirements

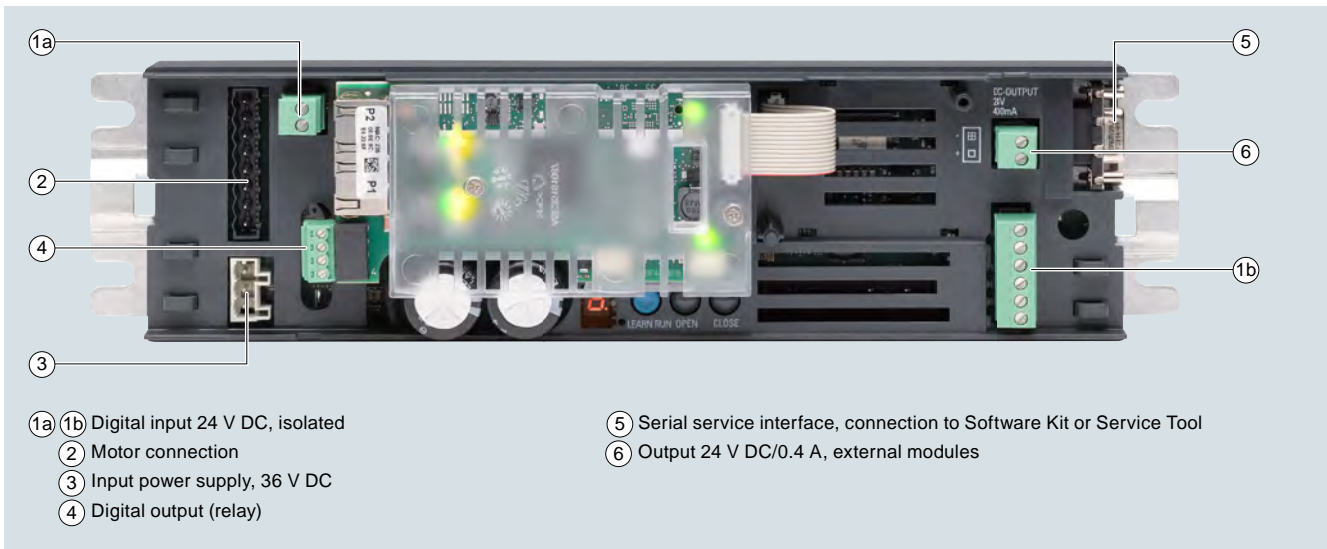
Automatic door controls  
for railway applications

Control devices > Platform screen door drive

### Technical specifications

Article number	6FB1231-3BM12-7AT0	6FB1231-3BM11-7AT0
	SIDOOR ATE530S COATED	SIDOOR ATE531S
<b>Standards, approvals, certificates</b>		
CE mark	Yes	No
UL approval	No	
China RoHS compliance	Yes	
Standard for safety	EN 61010-1 / EN 61010-2-201 / EN 14752 / EN ISO 13849-1 Cat. 2 PL d / IEC 62061: SIL 2	
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-25 °C	70 °C
• max.	50 °C	
• Remark	Screw control device thermally conductive onto a metallic mounting surface or standard rail mounting, otherwise the maximum operating temperature is only 40 °C	to ensure compliance with MTBF value, ensure that the ambient temperature is less than 50 °C for 90 % of operating time and screw the control unit onto a metallic mounting surface in a manner that ensures thermal conductivity or use standard rail mounting. At operating temperatures above 50 °C, the maximum output current of the 24 V DC output is a maximum of 0.1 A and the maximum number of cycles is 60/h
<b>Ambient temperature during storage/transportation</b>		
• Storage, min.	-40 °C	
• Storage, max.	85 °C	
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	2 000 m	
<b>Relative humidity</b>		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
<b>Dimensions</b>		
Width	320 mm	
Height	60 mm	
Depth	80 mm	

## Overview



## SIDOOR ATE530G

The SIDOOR ATE530G drive control is designed for controlling gap fillers between external train doors and the platform edge. The gap filler facilitates easy access for passengers. The innovative SIDOOR ATE530G drive solution enables operation of a gap filler with adjustable speed, acceleration and motor currents.

A project-specific motor is used depending on the application. The SIDOOR ATE530G controller is activated by digital signals from a higher-level door control, and reports information about its current state via digital signals back to the door control.

The following drive functions are supported:

- System start-up after power failure
- "Extend", "Retract" command
- Gap filler is moved by a travel curve profile
- Obstruction detection
- Ice-breaker function  
Icing can be shifted broken by repeated extension and retraction of the gap filler with increased force.
- Reversing at the platform edge

The SIDOOR ATE530G controller fulfills Basic Integrity in accordance with EN 50657:2017

## Ordering data

## Article No.

**SIDOOR ATE530G**  
control device for gap fillers

**SIDOOR ATE530G coated,**

For controlling gap fillers between external train doors and the platform edge.

**6FB1221-5SM10-7BP0**

## Products for specific requirements

Automatic door controls  
for railway applications

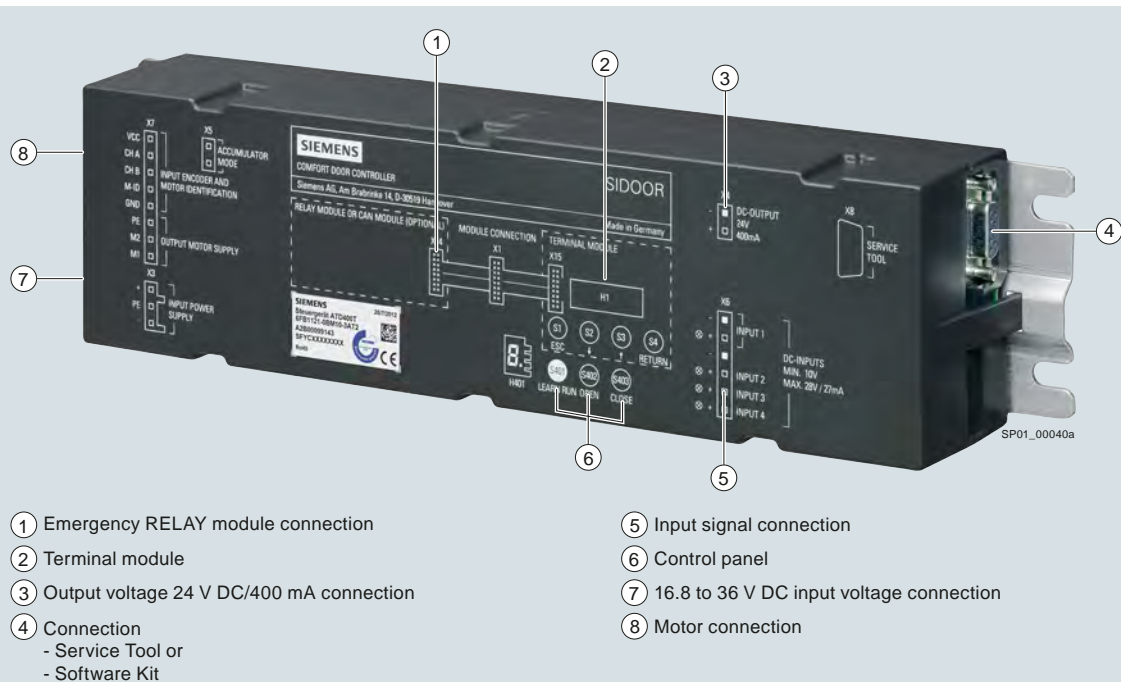
Control devices > Control device for gap fillers

### Technical specifications

Article number	<b>6FB1221-5SM10-7BP0</b> SIDOOR ATE530G COATED
<b>General information</b>	
Product type designation	ATE530G COATED
Mean time between failures (MTBF)	13 y
<b>Installation type/mounting</b>	
Installation and mounting instructions	No direct exposure to the sun
<b>Supply voltage</b>	
Design of the power supply	Via SIDOOR TRANSFORMER or via DC
Rated value (DC)	36 V
<b>Encoder supply</b>	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
<b>24 V encoder supply</b>	
• Output current, max.	400 mA
<b>Power</b>	
Active power input	80 W
Active power input, max.	540 W
Active power input (standby mode)	7 W
<b>Digital inputs</b>	
Control inputs isolated	Yes
Control inputs p-switching	Yes
<b>Input voltage</b>	
• for signal *0*, min.	-3 V
• for signal *0*, max.	5 V
• for signal *1*, min.	10 V
• for signal *1*, max.	28 V
<b>Input current</b>	
• for signal *1*, min.	3 mA
• for signal *1*, max.	15 mA
<b>Digital outputs</b>	
<b>Relay outputs</b>	
<b>Switching capacity of contacts</b>	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	0.5 A

Article number	<b>6FB1221-5SM10-7BP0</b> SIDOOR ATE530G COATED
<b>Standards, approvals, certificates</b>	
CE mark	Yes
EAC (formerly Gost-R)	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C
• max.	50 °C
• Remark	Screw control device thermally conductive onto a metallic mounting surface or standard rail mounting, otherwise the maximum operating temperature is only 40 °C
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	85 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• No condensation, min.	10 %
• No condensation, max.	93 %
<b>Dimensions</b>	
Width	320 mm
Height	60 mm
Depth	80 mm

## Overview



SIDOOR ATD400T interior railway door drive

The SIDOOR ATD400T interior railway door drive is an "intelligent" door drive which enables interior and gangway doors to be opened and closed at adjustable speeds and accelerations.

- Relay module design
- For dynamic door weights up to 180 kg
- Automatic door weight detection
- Operating temperature -20 to +70 °C <sup>1)</sup>
- Flexible motor management (two different motor types), automatic detection
- Opening width 0.25 to 4 m
- Door can be operated with and without closing springs (60 to 80 N)
- With two identical door leaves, can be used up to a train inclination of 0 to 10%
- Forces and energies are limited in accordance with EN 14752
- EMC according to EN 50121-3-2
- Fulfills HL3 according to fire protection standard EN 45545-2 (Railway applications – Fire protection on rail vehicles)
- Vandal-proof

<sup>1)</sup> Note:

- Maximum output current at 24 V DC:
  - 0.4 A at ≤ 55 °C ambient temperature during operation
  - 0.1 A from 55 °C to 70 °C ambient temperature during operation, with restrictions at operating temperatures > 55 °C
- Maximum ambient temperature during operation:
  - 55 °C
  - 70 °C with restrictions at operating temperatures > 55 °C
- Restrictions at operating temperatures > 55 °C:
  - Use the 24 V output voltage only for operating the control inputs (max. 0.1 A)
  - Use a sufficiently large (at least 350 x 350 mm), unpainted metal mounting plate
  - The maximum drive parameters are restricted to the default values
  - If temperature class T3 according to EN 50155 is used, the maximum air temperature of 85 °C must not be exceeded near the printed-circuit board

## Ordering data

## Article No.

**SIDOOR ATD400T**

Control device for interior railway doors, relay module design

**6FB1121-0BM13-3AT2**

## Products for specific requirements

Automatic door controls  
for railway applications

Control devices > Interior railway door drives

### Technical specifications

Article number	<b>6FB1121-0BM13-3AT2</b> SIDOOR ATD400T RELAY
<b>General information</b>	
Product type designation	ATD400T relay
<b>Installation type/mounting</b>	
Installation and mounting instructions	At operating temperatures > 55 °C a sufficiently large (at least 350 mm x 350 mm), unpainted, metal mounting plate must be used
<b>Supply voltage</b>	
Design of the power supply	DC
Rated value (DC)	24 V
<b>Input current</b>	
Current consumption, max.	15 A
<b>Encoder supply</b>	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
<b>24 V encoder supply</b>	
• Output current, max.	400 mA
• output current at 55 °C to 70 °C, max.	100 mA
<b>Power</b>	
Active power input	80 W
Active power input, max.	540 W
<b>Digital inputs</b>	
Control inputs isolated	Yes
Control inputs p-switching	Yes
<b>Input voltage</b>	
• for signal *0*, min.	-3 V
• for signal *0*, max.	5 V
• for signal *1*, min.	10 V
• for signal *1*, max.	28 V
<b>Input current</b>	
• for signal *1*, min.	9 mA
• for signal *1*, max.	27 mA
<b>Digital outputs</b>	
<b>Relay outputs</b>	
<b>Switching capacity of contacts</b>	
- at 50 V DC, min.	0.01 A; 50 V DC switching voltage not released for NFPA-relevant countries
- at 50 V DC, max.	1 A; 50 V DC switching voltage not released for NFPA-relevant countries
- at 230 V AC, min.	0.01 A
- at 230 V AC, max.	1 A

Article number	<b>6FB1121-0BM13-3AT2</b> SIDOOR ATD400T RELAY
<b>Mechanical data</b>	
Opening width of door, min.	0.25 m
Opening width of door, max.	4 m
Weight of door, max.	180 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	80 N
<b>Counterweight</b>	
• with SIDOOR M3 geared motor, max.	6 kg
<b>Interfaces</b>	
Interfaces/bus type	without
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	No
China RoHS compliance	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C
• max.	70 °C; At operating temperatures > 55 °C the operating parameters are limited to default values
• Remark	At operating temperatures > 55 °C, the maximum air temperature of 85 °C must not be exceeded near the printed-circuit board if temperature class T3 according to EN 50155 is used
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
<b>Relative humidity</b>	
• No condensation, min.	10 %
• No condensation, max.	93 %
<b>Fire resistance</b>	
• Behavior in fire	complies with EN 45545-2 Hazard Level HL3
<b>Dimensions</b>	
Width	320 mm
Height	60 mm
Depth	80 mm



**Overview Software Kit**

SIDOOR Software Kit

The scope of delivery of the SIDOOR Software Kit includes an installation CD.

The CD includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

Note:

Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

**Ordering data****Article No.**

<b>SIDOOR Software Kit</b>	<b>6FB1105-0AT01-6SW0</b>
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**Overview Service Tool**

The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

The Service Tool is connected to the various controllers by the respective cable.

You do not need to open the cover of the controller to do this.

Note:

If the Service Tool is in the "Quick adjustment" or "Total adjustment" menu, the run commands of the controller are blocked via the command inputs.

**Ordering data****Article No.****SIDOOR Service Tool,  
hand-held terminal****6FB1105-0AT01-6ST0**

for parameter assignment of control devices

## Products for specific requirements

Automatic door controls  
for railway applications

### Geared motors

#### Overview

SIDOOR motors are speed controlled, taking set force and speed limits into account. The gear outlet direction is defined as left or right when viewing the gear unit from the front. Force transmission is via a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with two door clutch holders. This enables it to drive both single-side and centrally opening doors.

SIDOOR geared motors are available in two technological versions.

- 1. DC technology in version (area of application: interior railway doors)
  - DC geared motor
  - SIDOOR geared motors are a combination of gear unit, motor, and encoder. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. The variable speed drive unit comprises a speed-controlled DC motor with non-self-locking gearing.
- 2. EC technology in version (area of application: platform screen doors)
  - EC direct drive
  - SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor. The EC direct drive can be fitted in various mounting orientations, facilitating reduced inventory management and minimizing assets.
  - EC geared motors
  - EC geared motors are electronically commutated DC motors with non-self-locking gearing and are speed-controlled. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. Due to the brushless drive technology, EC geared motors are subject to less abrasion compared with DC geared motors and thus have a longer service life. On account of the brushless drive technology, no commutation noises come from this motor, so it generates less noise than the DC geared motors.

#### Motors for interior railway door drives

The following **DC geared motors** are available for interior railway door drives. They should be selected according to the dynamic door weight.

- SIDOOR MDG180 geared motors, compliance with fire protection standard EN 45545-2 (max. door weight 180 kg)
  - SIDOOR MDG180 L EN 45545-2 (pinion left) 6FB1103-0AT16-4MB0
  - SIDOOR MDG180 R EN 45545-2 (pinion right) 6FB1103-0AT15-4MB0
- SIDOOR M3 geared motors (max. door weight 180 kg)
  - SIDOOR M3 L (pinion left) 6FB1103-0AT10-4MB0
  - SIDOOR M3 R (pinion right) 6FB1103-0AT11-4MB0

#### Motors for platform screen door drives

##### EC technology:

- SIDOOR MEG251 geared motors (max. door weight 250 kg)
  - SIDOOR MEG251 L (pinion left), 6FB1203-5AT00-7MP0
  - SIDOOR MEG251 R (pinion right), 6FB1203-5AT01-7MP0



Photo: DC geared motor SIDOOR M3 L, 6FB1103-0AT10-4MB0 or SIDOOR MDG180 L, 6FB1103-0AT16-4MB0. (version with pinion left)



Photo: EC geared motor SIDOOR MEG251 L, 6FB1203-5AT00-7MP0. (version with pinion left)

Ordering data	Article No.	Article No.
<b>Motors for interior railway door drives</b> SIDOOR MDG180 geared motors <ul style="list-style-type: none"> <li>• MDG180 L, EN 45545-2</li> <li>• MDG180 R, EN 45545-2</li> </ul> SIDOOR M3 geared motors <ul style="list-style-type: none"> <li>• M3 L</li> <li>• M3 R</li> </ul>	<b>6FB1103-0AT16-4MB0</b> <b>6FB1103-0AT15-4MB0</b>  <b>6FB1103-0AT10-4MB0</b> <b>6FB1103-0AT11-4MB0</b>	<b>Motors for platform screen doors</b> SIDOOR MEG251 EC technology geared motor <ul style="list-style-type: none"> <li>• MEG251 L</li> <li>• MEG251 R</li> </ul>

**6FB1203-5AT00-7MP0**  
**6FB1203-5AT01-7MP0**

## Technical specifications

Article number	6FB1103-0AT16-4MB0	6FB1103-0AT15-4MB0	6FB1103-0AT10-4MB0	6FB1103-0AT11-4MB0	6FB1203-5AT00-7MP0	6FB1203-5AT01-7MP0
	SIDOOR MDG180 L DIN EN 45545-2	SIDOOR MDG180 R DIN EN 45545-2	SIDOOR M3 L	SIDOOR M3 R	SIDOOR MEG251 L	SIDOOR MEG251 R
<b>Supply voltage</b>						
Rated value (DC)	30 V				24 V	
<b>Input current</b>						
Operational current (rated value)	4 A				6.8 A	
<b>Power</b>						
Active power input	120 W				163 W	
<b>Mechanical data</b>						
Torque of the rotary operating mechanism (rated value)	3 N·m				4.1 N·m	
Speed, max.	0.65 m/s				0.75 m/s	
Gear ratio	15					
Number of pulses per revolution, max.	100					
Weight of door, max.	180 kg				250 kg	
Breakaway force, max.					50 N	
<b>Standards, approvals, certificates</b>						
CE mark	Yes					
UL approval	No		Yes		No	
EAC (formerly Gost-R)	Yes					
TÜV Inspectorate approval			Yes			
China RoHS compliance	Yes					
<b>Ambient conditions</b>						
<b>Ambient temperature during operation</b>						
• min.	-20 °C					
• max.	50 °C				70 °C	
<b>Ambient temperature during storage/transportation</b>						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					
<b>Fire resistance</b>						
• Behavior in fire	complies with EN 45545-2 Hazard Level HL3					
<b>Dimensions</b>						
Height of motor	98 mm				100 mm	
Length of motor	236 mm				249 mm	
Diameter of motor	63 mm				62 mm	
Width of gear unit, including drive pinion	85 mm				86 mm	

## Products for specific requirements

Automatic door controls  
for railway applications

### Direct drives

#### Overview



SIDOOR MED280 direct drive

SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor with non-self-locking gearing.

Direct drives are designed for certain masses and can control both drive directions.

- SIDOOR MED280 direct drive for max. 280 kg (6FB1203-0AT12-7DA0)

#### Technical specifications

Article number	<b>6FB1203-0AT12-7DA0</b> SIDOOR MED280
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Input current</b>	
Operational current (rated value)	9.7 A
<b>Power</b>	
Active power input	233 W
<b>Mechanical data</b>	
Torque of the rotary operating mechanism (rated value)	4.7 N·m
Speed, max.	0.8 m/s
Number of pulses per revolution, max.	1 024
Weight of door, max.	280 kg
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-25 °C
• max.	70 °C
<b>Ambient temperature during storage/transportation</b>	
• Storage, min.	-40 °C
• Storage, max.	85 °C
<b>Dimensions</b>	
Width of motor	160 mm
Height of motor	140 mm
Length of motor	56 mm
• including drive pinion	91 mm

#### Ordering data

#### Article No.

#### SIDOOR MED280 direct drive

Motor for door control, for max. dynamic door weights of 280 kg

**6FB1203-0AT12-7DA0**

**Overview**

A comprehensive range of accessories is available for the SIDOOR systems. This is necessary to ensure low-noise operation of the door leaves by the controller.

**Accessories for SIDOOR DC and EC geared motors**Rubber-metal anti-vibration mount

To ensure low-noise door operation, the SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR M3 and SIDOOR MDG180 DC geared motors (also for EN 45545-2) and SIDOOR MEG251 EC geared motors (door weights up to 250 kg)
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for SIDOOR M4 DC geared motors (door weights up to 400 kg)



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0

Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for SIDOOR M3 and SIDOOR MDG180 DC geared motors (also for EN 45545-2) and SIDOOR MEG251 EC geared motors for flexible accommodation of the rubber-bonded metal.
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit, this enables the toothed belt to be set to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

Door clutch holder

The door clutch holder 6FB1104-0AT01-0CP0 serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

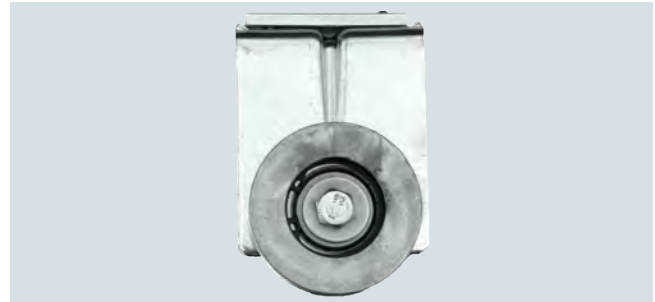


Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system.

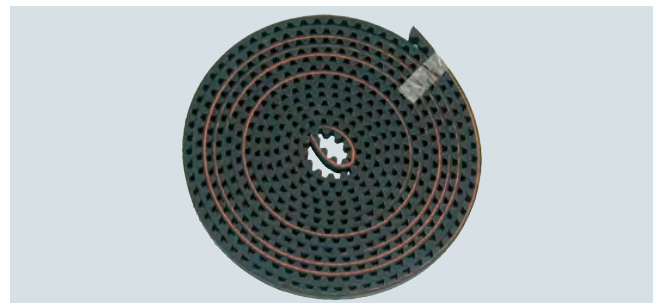
The STS toothed belt is redirected via this deflector unit.



Deflector unit 6FB1104-0AT03-0AS0

STS toothed belt

The door system is moved between the end positions of the door using the STS toothed belt 6FB1104-0AT0.-0AB0. Two different toothed belt lengths are available.



Toothed belt 6FB1104-0AT01-0AB0, length 4 m



Toothed belt 6FB1104-0AT02-0AB0, length 45 m

## Products for specific requirements

Automatic door controls  
for railway applications

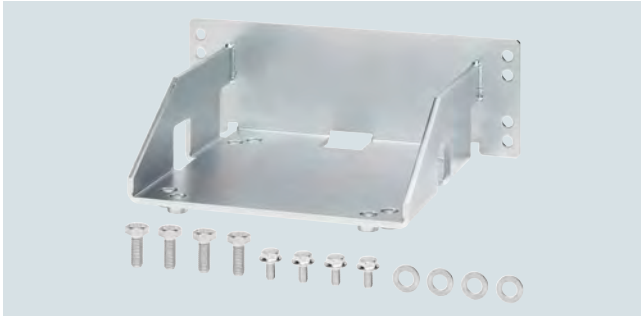
### Accessories

#### Overview

#### **Accessories for the SIDOOR MED280 EC direct drive, for the controller for the SIDOOR ATE530S/ATE531S platform screen door drive**

##### Motor holder

- Motor holder 6FB1104-0AT03-0AD0 for accommodation of the SIDOOR MED280 direct drive.



SIDOOR motor holder

##### Mounting bracket

- For mounting the SIDOOR motor holder 6FB1104-0AT01-0AS0. Identical to the mounting bracket 6FB1104-0AT01-0AS0 for DC geared motors.



Mounting bracket for geared motor

- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (large) 6FB1104-0AT05-0AS4



SIDOOR mounting bracket, large

- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (small) 6FB1104-0AT05-0AS5



SIDOOR mounting bracket, small

##### Door clutch holder

- For attaching both ends of the toothed belt and connecting the respective door panel to the toothed belt, width 20 mm, 6FB1104-0AT05-0AS1



SIDOOR door clutch holder

##### Deflector unit

- For attaching the SIDOOR toothed belt and fixing to the door 6FB1104-0AT07-0AS0



SIDOOR deflector unit

##### STD toothed belt

- As a connection between the door system and the end positions of the door, toothed belt width 20 mm. Length 4 m, 6FB1104-0AT05-0AB0



SIDOOR toothed belt, small

- Toothed belt width 20 mm. Length 45 m 6FB1104-0AT06-0AB1



SIDOOR toothed belt, large

Ordering data	Article No.	Ordering data	Article No.
<b>Accessories for the SIDOOR MED280 EC direct drive, for the control device for the SIDOOR ATE530S/ATE531S platform screen door drive</b>		<b>Accessories for SIDOOR DC and EC geared motors</b>	
<b>Motor holder for SIDOOR MED280 direct drive</b>	6FB1104-0AT03-0AD0	<b>Rubber-metal anti-vibration mounts for geared motors</b>	
<b>Mounting bracket for mounting the motor holder</b>	6FB1104-0AT01-0AS0	<ul style="list-style-type: none"> <li>SIDOOR rubber-metal anti-vibration mount for geared motors for door weights up to 300 kg</li> </ul>	6FB1104-0AT02-0AD0
<b>Mounting bracket with tensioning device for mounting the deflector unit</b>		<ul style="list-style-type: none"> <li>SIDOOR rubber-metal anti-vibration mount for geared motors for door weights from 300 kg</li> </ul>	6FB1104-0AT01-0AD0
<ul style="list-style-type: none"> <li>Large</li> <li>Small</li> </ul>	6FB1104-0AT05-0AS4 6FB1104-0AT05-0AS5	<b>Mounting bracket</b>	
<b>SIDOOR door clutch holder</b>		<ul style="list-style-type: none"> <li>SIDOOR mounting bracket for geared motor</li> </ul>	6FB1104-0AT01-0AS0
<ul style="list-style-type: none"> <li>For toothed belt, width 20 mm</li> </ul>	6FB1104-0AT05-0AS1	<ul style="list-style-type: none"> <li>SIDOOR mounting bracket with tensioning device for deflector pulley</li> </ul>	6FB1104-0AT02-0AS0
<b>SIDOOR deflector unit</b>	6FB1104-0AT07-0AS0	<b>SIDOOR door clutch holder</b>	
<b>SIDOOR STD toothed belt</b>		<ul style="list-style-type: none"> <li>For toothed belt, width 12 mm</li> </ul>	6FB1104-0AT01-0CP0
Width 20 mm		<b>SIDOOR deflector unit</b>	6FB1104-0AT03-0AS0
<ul style="list-style-type: none"> <li>4 m</li> <li>45 m</li> </ul>	6FB1104-0AT05-0AB0 6FB1104-0AT06-0AB1	<b>SIDOOR STS toothed belt</b>	
		Width 12 mm	
		<ul style="list-style-type: none"> <li>4 m</li> <li>45 m</li> </ul>	6FB1104-0AT01-0AB0 6FB1104-0AT02-0AB0

## Products for specific requirements

### Condition monitoring systems

#### Introduction, SIPLUS CMS1200 Condition Monitoring System

##### Overview



SIPLUS CMS family

With the Condition Monitoring System from Siemens you can constantly monitor your machines and plants. Maintenance procedures can be planned better and only performed when they are actually necessary – predictive maintenance.

##### Overview SIPLUS CMS1200 Condition Monitoring System



The SIPLUS CMS1200 Condition Monitoring System is part of SIMATIC S7-1200 and is designed for the early detection of mechanical damage.

It provides the following benefits:

- vRMS machine monitoring in acc. with ISO 10816-3
- aRMS machine monitoring
- Detailed identification of damage with frequency-selective diagnostics
- Raw data recording and export for SIPLUS CMS X-Tools
- Trend recording and analysis
- Signaling of limit violations
- Permanent monitoring to protect the machines
- Effective monitoring of important processes and systems
- Early detection of damage
- Scheduled maintenance instead of spontaneous repair
- Reduction in maintenance costs
- Increase in system availability
- Optimum utilization of the service life of the units



## Products for specific requirements

### Condition monitoring systems

#### SIPLUS CMS1200 Condition Monitoring System

#### SIPLUS CMS1200 SM 1281 Condition Monitoring

### Overview



SIPLUS CMS1200 SM 1281 Condition Monitoring forms part of SIMATIC S7-1200 and is used for the:

- Monitoring of motors, generators, pumps, fans, or other mechanical components
- Recording and analysis of vibrations
- Expansion capability of up to 7 modules

### Ordering data

#### SIPLUS CMS1200 SM 1281 Condition Monitoring

Module for SIMATIC S7-1200 for monitoring vibrations in mechanical components based on characteristic values and frequency-selective analysis functions.

### Article No.

6AT8007-1AA10-0AA0

#### SIPLUS CMS1200 Ready to use Bundle

Consisting of:

- SM1281 Condition Monitoring
- SM1281 Shield clamp set
- S7-1214C-CPU
- S7-1200 Battery Board
- Memory card with TIA project

6AT8007-1AA30-0AA0

#### SIPLUS CMS1200 X-Tools Bundle

Consisting of:

- SM1281 Condition Monitoring
- SM1281 Shield clamp set
- X-Tools Professional V05.00
- X-Tool Analysis library V05.00

6AT8007-1AA31-0AA0

#### Accessories

#### SIPLUS CMS1200 SM 1281 Shield clamp set

For EMC-compliant connection of signal and encoder cables to SIPLUS CMS1200 SM 1281 Condition Monitoring.

6AT8007-1AA20-0AA0

### Article No.

#### SIPLUS CMS VIB-SENSOR

Piezoelectric sensor for connection to SIPLUS CMS1200 SM 1281 Condition Monitoring.

- SIPLUS CMS VIB-Sensor S01, frequency range 0,5 Hz to 15 kHz; measuring range 50G; sensitivity 100 mV/G (+/-10 %); MIL connector on top
- SIPLUS CMS VIB-Sensor S02, frequency range 1 Hz to 15 kHz; measuring range 500G; sensitivity 10 mV/G (+/-10 %); MIL connector on top
- SIPLUS CMS VIB-Sensor S03, frequency range 0,2 Hz to 3 kHz; measuring range 10G; sensitivity 500 mV/G (+/-10 %); MIL connector on top

6AT8002-4AB00

6AT8008-2AA00-0AA0

6AT8008-2AA02-0AA0

#### SIPLUS CABLE-MIL

For connection of VIB-SENSOR S01, S02 and S03 vibration sensor to SIPLUS CMS1200 SM 1281 Condition Monitoring.

- SIPLUS CABLE-MIL-300; length 3 m
- SIPLUS CABLE-MIL-1000; length 10 m
- SIPLUS CABLE-MIL-3000; length 30 m

6AT8002-4AC03

6AT8002-4AC10

6AT8008-2BA12-0AA0

## Products for specific requirements

Condition monitoring systems

SIPLUS CMS1200 Condition Monitoring System

### SIPLUS CMS1200 SM 1281 Condition Monitoring

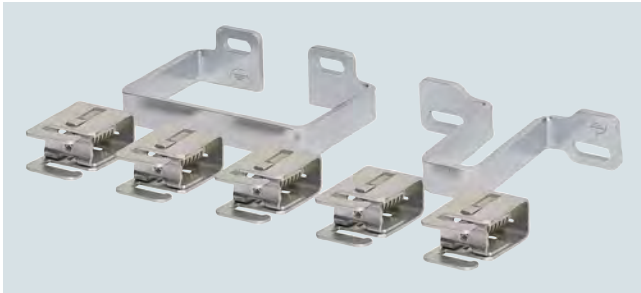
#### Technical specifications

Article number	<b>6AT8007-1AA10-0AA0</b> SM1281_Condition_Monitoring
<b>General information</b>	
Product type designation	SM1281
Product description	S7-1200 module for the monitoring of vibrations on mechanical components based on parameters and frequency-selective analysis functions
<b>Installation type/mounting</b>	
Mounting type	Rail or wall mounting
Mounting position	Horizontal, vertical
Recommended mounting position	Horizontal
<b>Supply voltage</b>	
Type of supply voltage	DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
Current consumption, typ.	200 mA
Current consumption, max.	250 mA
from backplane bus 5 V DC, typ.	80 mA
from backplane bus 5 V DC, max.	85 mA
<b>Power loss</b>	
Power loss, typ.	4.8 W
<b>Memory</b>	
Total memory capacity	1 Gbyte
<b>Hardware configuration</b>	
Design of hardware configuration	Modular, up to 7 modules per CPU
<b>Speed input</b>	
Number of speed inputs	1
<b>Input voltage</b>	
• 24 V DC digital	Yes
<b>Sensor input</b>	
Number of IEPE sensor inputs	4
Sampling frequency, max.	46 875 Hz
<b>Interfaces</b>	
Type of data transmission	Export of raw data as WAV file for further analysis (e.g. using CMS X-Tools) can be downloaded via browser/FTP, online data transfer to CMS X-Tools
Ethernet interface	Yes
<b>Protocols</b>	
Bus communication	Yes
<b>Web server</b>	
• HTTP	Yes

Article number	<b>6AT8007-1AA10-0AA0</b> SM1281_Condition_Monitoring
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
• Status indicator digital input (green)	No
<b>Integrated Functions</b>	
<b>Monitoring functions</b>	
• Monitoring of the sensor inputs	Yes; Cable break and short-circuit
• Vibration characteristic monitoring via RMS value of the vibration speed	Yes
• Vibration characteristic monitoring via RMS value of the vibration acceleration	Yes
• Vibration characteristic monitoring via diagnostic characteristic value	Yes
• Frequency-selective monitoring via vibration speed spectrum	Yes
• Frequency-selective monitoring via vibration acceleration spectrum	Yes
• Frequency-selective monitoring via envelope curve analysis	Yes
<b>Measuring functions</b>	
• Physical measuring principle	Vibration acceleration
<b>Measuring range</b>	
- Measurement range vibration frequency, min.	0.1 Hz
- Measurement range vibration frequency, max.	10 000 Hz
<b>Standards, approvals, certificates</b>	
Certificate of suitability	CE
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Fall height, max.	0.3 m; five times, in product package
<b>Software</b>	
Browser software required	Web browser Mozilla Firefox (ESR31) or Microsoft Internet Explorer (10/11)
<b>Connection method</b>	
required front connector	Yes
Design of electrical connection	Screw connection
<b>Mechanics/material</b>	
Material of housing	Plastic: polycarbonate, abbreviation: PC- GF 10 FR
<b>Dimensions</b>	
Width	70 mm
Height	112 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	260 g

## Overview

### SIPLUS CMS1200 SM 1281 shield clamp set



CMS1200 accessories

SIPLUS CMS1200 SM 1281 shield clamp set,  
 6AT8007-1AA20-0AA0

An additional shield clamp set must be ordered for the EMC-compliant connection of cables to the SIPLUS CMS1200 SM 1281 Condition Monitoring.

The shield clamp set comprises two shield clamps and five terminal clamps. One shield clamp is screwed on above and one below the module. The sensor cable shields are connected to the shield clamps by means of the terminal clamps.

### VIB-SENSOR vibration sensors



VIB-SENSOR S01 vibration sensor

- VIB-SENSOR S01 vibration sensor, 6AT8002-4AB00
- VIB-SENSOR S02 vibration sensor, 6AT8008-2AA00-0AA0
- VIB-SENSOR S03 vibration sensor, 6AT8008-2AA02-0AA0

The VIB-SENSOR vibration sensor with IEPE (integrated electronics piezo-electric) interface can be directly connected to the CMS1200 SM1281 Condition Monitoring module.

The sensor detects vibration accelerations in the frequency range from 0.5 Hz to 15 kHz with a resolution of 100 mV/g.

A threaded screw with an M8 male thread for mounting to the measuring point is included in the scope of delivery. The connecting cable is connected to the vibration sensor via the MIL connector.

### SIPLUS CABLE-MIL connecting cables



SIPLUS CABLE-MIL connecting cables

- SIPLUS CMS CABLE-MIL connecting cables  
 6AT8002-4AC03, 6AT8002-4AC10 and 6AT8008-2BA12-0AA0

The VIB-SENSOR vibration sensor is connected to the SIPLUS CMS1200 SM1281 Condition Monitoring module by means of the SIPLUS CMS CABLE-MIL connecting cable.

This high-quality industrial cable is made of black polyurethane and is pre-assembled on one end with a MIL connector (MIL-C5015). The open cable end of the shielded two-wire cable is connected directly to the screw terminals of the basic unit.

The connecting cable is available in lengths of 3 m, 10 m and 30 m.

## Products for specific requirements

Condition monitoring systems

SIPLUS CMS1200 Condition Monitoring System

### Accessories

Ordering data	Article No.	Article No.
<b>SIPLUS CMS1200 SM 1281 Shield clamp set</b> For EMC-compliant connection of signal and encoder cables to SIPLUS CMS1200 SM 1281 Condition Monitoring.	<b>6AT8007-1AA20-0AA0</b>	
<b>VIB-SENSOR S01, S02 and S03 vibration sensors</b> Piezoelectric sensor for connection to SIPLUS CMS1200 SM 1281 Condition Monitoring.	<b>6AT8002-4AB00</b>	
<ul style="list-style-type: none"> <li>• SIPLUS CMS VIB sensor S01, frequency range 0.5 Hz to 15 kHz; measuring range 50G; sensitivity 100 mV/G (+/-10%); MIL connector on top</li> </ul>	<b>6AT8008-2AA00-0AA0</b>	
<ul style="list-style-type: none"> <li>• SIPLUS CMS VIB sensor S02, frequency range 1 Hz to 15 kHz; measuring range 500G; sensitivity 10 mV/G (+/-10%); MIL connector on top</li> </ul>	<b>6AT8008-2AA02-0AA0</b>	
<ul style="list-style-type: none"> <li>• SIPLUS CMS VIB sensor S03, frequency range 0.2 Hz to 3 kHz; measuring range 10G; sensitivity 500 mV/G (+/-10%); MIL connector on top</li> </ul>		
<b>SIPLUS CABLE-MIL</b> For connection of VIB-SENSOR S01 vibration sensor to SIPLUS CMS1200 SM 1281 Condition Monitoring.		
<ul style="list-style-type: none"> <li>• SIPLUS CABLE-MIL-300; length 3 m</li> </ul>		<b>6AT8002-4AC03</b>
<ul style="list-style-type: none"> <li>• SIPLUS CABLE-MIL-1000; length 10 m</li> </ul>		<b>6AT8002-4AC10</b>
<ul style="list-style-type: none"> <li>• SIPLUS CABLE-MIL-3000; length 30 m</li> </ul>		<b>6AT8008-2BA12-0AA0</b>

### Technical specifications

Article number	<b>6AT8007-1AA20-0AA0</b> SM 1281 shield clamp set	Article number	<b>6AT8007-1AA20-0AA0</b> SM 1281 shield clamp set
<b>General information</b>		<b>Installation type/mounting</b>	
Product type designation	Shield clamp set for SM1281	Mounting type	Wall mount
Product description	For the EMC-compliant connection of cables to the SIPLUS CMS1200 SM 1281 Condition Monitoring Module	<b>Connection method</b>	
		Number of signal cables connectable to the shield support	5
Article number	<b>6AT8002-4AB00</b> SIPLUS CMS2000 VIB-SENSOR S01	<b>6AT8008-2AA00-0AA0</b> SIPLUS CMS VIB-SENSOR S02	<b>6AT8008-2AA02-0AA0</b> SIPLUS CMS VIB-SENSOR S03
<b>General information</b>			
Product type designation	VIB sensor S01	VIB-Sensor S02	VIB-Sensor S03
Product description	piezoelectric sensor for connection to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module	piezoelectric sensor for connection to SIPLUS CMS1200 or SIPLUS CMS2000	
<b>Installation type/mounting</b>	incl. mounting bolts UNF1/4-28 on M6 and M8		
<b>Input current</b>			
Type of power supply	IEPE 2 to 10 mA		
<b>Encoder</b>			
<b>Encoder signals, IEPE</b>			
• Signal voltage (DC), min.	10 V		
• Signal voltage (DC), max.	14 V		
<b>Integrated Functions</b>			
<b>Measuring functions</b>			
• Physical measuring principle	Piezo-quartz recorder with integrated evaluation electronics		
• Operating range of sensor at +/- 3 dB, min.	0.5 Hz	1 Hz	0.2 Hz
• Operating range of sensor at +/- 3 dB, max.	15 000 Hz		3 000 Hz
• Resonance frequency	23 kHz		16 kHz

**Technical specifications**

Article number	<b>6AT8002-4AB00</b> SIPLUS CMS2000 VIB-SENSOR S01	<b>6AT8008-2AA00-0AA0</b> SIPLUS CMS VIB-SENSOR S02	<b>6AT8008-2AA02-0AA0</b> SIPLUS CMS VIB-SENSOR S03
<b>Measuring range</b>			
- Measurement range vibration acceleration, max.	50 gn	500 gn	10 gn
- Sensitivity, typ.	100 mV/gn	10 mV/gn	500 mV/gn
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-50 °C		
• max.	120 °C	121 °C	
<b>Cables</b>			
Cable length, max.	30 m		
<b>Mechanics/material</b>			
Material of housing	Stainless steel		
Article number	<b>6AT8002-4AC03</b> SIPLUS CMS2000 CABLE 3m	<b>6AT8002-4AC10</b> SIPLUS CMS2000 CABLE 10m	<b>6AT8008-2BA12-0AA0</b> SIPLUS CMS CABLE 30m
<b>General information</b>			
Product type designation	Cable MIL-300	Cable MIL-1000	Cable-MIL-3000
Product description	For connection of the VIB-SENSOR S01 vibration sensor to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module		for connection of VIB-Sensor vibration sensor to SIPLUS CMS1200 or SIPLUS CMS2000
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-25 °C		
• max.	122 °C		121 °C
<b>Cables</b>			
Type of insulation	black polyurethane		
Design of shield	Braided shielding with stranded drain wire		
Cable length	3 m	10 m	30 m
<b>Connection method</b>			
Type of connection	MIL-C5015 / open cable end		

## Products for specific requirements

### Notes

## Overviews



1/2	SIMATIC HMI
15/4	PC-based Automation
15/5	SIMATIC PCS 7
15/8	SIMATIC NET
15/10	SIMATIC Ident

## Overviews

### SIMATIC HMI

#### Introduction

#### Overview



#### **SIMATIC HMI operator control and monitoring systems – efficient machine-level operator control and monitoring**

Equipment for monitoring and operator control is needed wherever people have to work with or on machinery and plants performing diverse tasks from cylinder driers to waste compactors. It is not difficult to find the right device for your specific task. The challenge is to find a solution that is future-proof and flexible, that can be integrated into higher-level networks, and that can also meet the ever-increasing demands for transparency and data provision. SIMATIC HMI Panels have proven their value in a variety of different applications in all industrial sectors over many years. The range of the systems in use is just as wide as that of the applications and technologies in the respective plants.

SIMATIC HMI stands for highly efficient machine-level operator control and monitoring and has some unique advantages:

- Efficient engineering  
Visualization can be created more quickly and easily than ever before.
- Innovative design and operation  
Visualization becomes the outstanding feature of the machine.
- Brilliant HMI operator panels  
The right operator panel for every application.
- Backup – with security  
Protection for investments and know-how, secure operation.
- Commissioning in the fast lane  
Lose no time with testing and servicing.
- Openness with PC-based  
For flexible, independent applications

<http://www.siemens.com/hmi>

#### **NEW: SIMATIC WinCC Unified system – unlimited visualization for every application**

SIMATIC WinCC Unified is a totally new visualization system for meeting the challenges of digitalization in machine and plant construction.

State-of-the-art hardware and software technologies make this possible now and in the future. Tried and tested engineering in the TIA Portal, the latest web technology and great reserves of performance for the coming years combined with the freedom to implement your ideas as you imagine them.

<http://www.siemens.com/wincc-unified>

#### **SIMATIC HMI software – a lot more than just visualization software**

With the SIMATIC WinCC (TIA Portal), SIMATIC WinCC and SIMATIC WinCC Open Architecture product families, SIMATIC HMI covers the entire engineering and visualization software spectrum for the human machine interface.

- Almost the entire range of SIMATIC operator panels can be configured with SIMATIC WinCC (TIA Portal), the successor to SIMATIC WinCC flexible.  
The functionality covers both visualization tasks at machine level and SCADA applications on PC-based multi-user systems.
- The current version 7.5 of SIMATIC WinCC is available for extremely complex process visualization tasks and SCADA applications, e.g. taking account of redundant solutions and vertical integration all the way to plant intelligence solutions.
- Ultimately, SIMATIC WinCC Open Architecture addresses applications that require extensive customer-specific adaptations or manage large and/or complex applications, as well as projects that demand special system requirements and functions.

<http://www.siemens.com/hmi-software>

#### **NEW: SIMATIC WinCC Unified visualization software**

SIMATIC WinCC Unified software enables access to open interfaces, modern web technologies and consistent integration in order to implement modern visualization concepts simply and easily in the TIA Portal.

<http://www.siemens.com/wincc-unified-software>

#### **SIMATIC HMI – brilliant and rugged operator panels**

##### Basic HMI – for the entry level

- Key Panels  
Pre-assembled and ready for installation, for conventional operator panels. No configuration required with WinCC!  
<http://www.siemens.com/key-panels>
- Basic Panels  
The entry level series for simple HMI applications.  
<http://www.siemens.com/basic-panels>

##### Advanced HMI Panel-based - for higher requirements

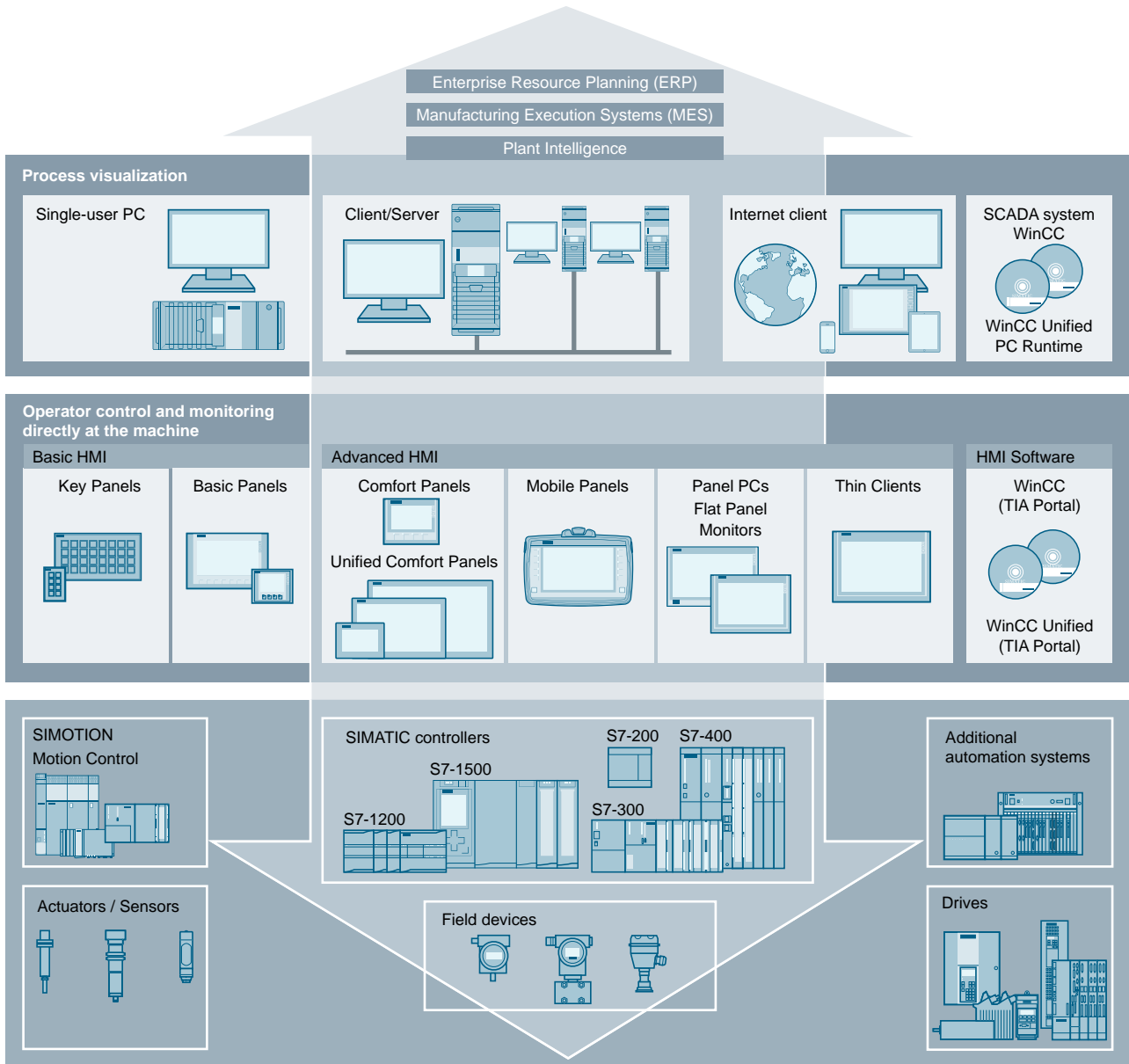
- New: SIMATIC HMI Unified Comfort Panels  
High-end performance and state-of-the-art technology for the future of visualization.  
<http://www.siemens.com/wincc-unified-hardware>
- Comfort Panels  
High-end functionality for demanding indoor and outdoor HMI applications.  
<http://www.siemens.com/comfort-panels>
- Mobile Panels  
Portable operator panels for mobile deployment on site.  
<http://www.siemens.com/mobile-panels>

#### **Individual HMI devices in customized versions**

<http://www.siemens.com/customized-automation>



**Overview**



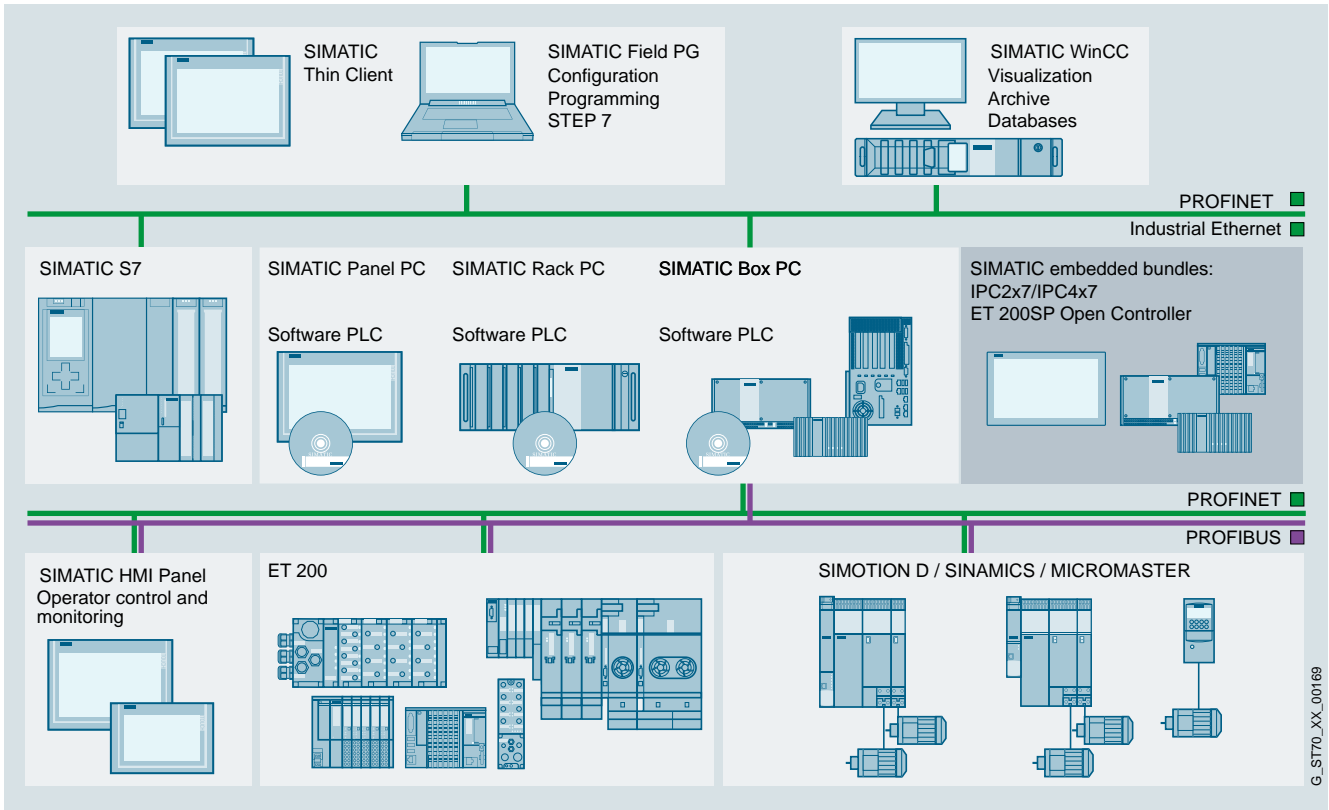
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## Overviews

### PC-based Automation

#### Introduction

#### Overview



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#### **SIMATIC PC-based Automation**

<http://www.siemens.com/pc-based>

#### Industrial IoT Gateway - SIMATIC IOT2000

An intelligent gateway which harmonizes communication between the various sources of data before analyzing it and forwarding it to the corresponding recipients. An easy-to-implement solution.

<http://siemens.com/iot2000>

#### Industrial PCs

Our reliable and innovative industrial PCs are the optimal PC hardware platform for PC-based Automation from Siemens.

- Rack PC
- Box PC
- Panel PC
- Tablet PC
- Industrial monitors and thin clients
- Devices for special requirements
  - Fully-enclosed IP65 devices
  - Devices with stainless steel fronts
  - Devices for hazardous areas
- IPC software
- Embedded bundles/software packages

<http://www.siemens.com/simatic-ipc>

#### Software controller

The SIMATIC S7-1500 Software Controller implements a SIMATIC S7-1500 controller on SIMATIC IPC. It is particularly suitable for control solutions in special-purpose machine manufacturing which involve a high-performance implementation of complex control tasks, the integration of PC applications, or the realization of multiple tasks on a single device.

<http://www.siemens.com/software-controller>

#### PC-based controllers

PC-based controllers combine the functions of a PC-based software controller with visualization, PC applications and central I/Os (inputs/outputs) in a single, compact device. The SIMATIC ET 200SP Open Controller is an industrial PC with the design of the ET 200SP I/O system and a pre-installed S7-1500 Software Controller.--

<http://www.siemens.com/open-controller>

#### **Application examples and references**

You can find an overview of the references and application examples at the Reference Center and on the following web pages:

<http://www.siemens.com/automation/references>

or

<https://new.siemens.com/global/en/products/automation/references.html>

**Overview**


SIMATIC PCS 7

***Distributed Control System SIMATIC PCS 7:  
Room for new perspectives***

In process engineering plants, the process control system is the starting point for optimal value added: All procedures and processes can be operated, monitored and influenced with the process control system.

The more powerful the process control system, the more effectively this potential can be used. For this reason, performance is in the foreground with SIMATIC PCS 7, alongside scalability, flexibility, and integration. Starting with planning and engineering, the process control system offers powerful tools, functions and features for cost-effective and efficient plant operation through all phases of the plant life cycle.

***Performance through integration***

Integration is one of the special strengths of SIMATIC PCS 7. This has many aspects:

- Horizontal integration into TIA
- Vertical integration into hierarchical communication
- Integration of the field level, including drives, switchgear, etc.
- Integrated functions, e.g. for batch process automation, route control, process safety, energy management, telecontrol tasks, etc.

Horizontal integration

A system for integrated automation of the entire process chain, from incoming raw materials to outgoing goods – this is one of the decisive advantages resulting from the seamless integration of SIMATIC PCS 7 into Totally Integrated Automation.

The process control system is mainly responsible for automating the primary processes here, but it can do much more: All auxiliary facilities, as well as the electrical infrastructure in the form of low-voltage or medium-voltage switchgear and the building management system, can also be integrated into the system.

Integration of selected SIMATIC standard components – automation systems, industrial PCs, network components, or distributed process I/O – into the process control system guarantees optimum interaction of individual components, and secures economic benefits such as simple selection, reduced stock keeping, and global support.

Vertical integration

The hierarchical communication of a company encompasses the field level, the control level, and the process level, up to management and enterprise resource planning (ERP). Thanks to standardized interfaces – based on international industry standards as well as internal interfaces – SIMATIC PCS 7 is able to provide process data for analysis, planning, coordination, and optimization of plant sequences or production and business processes – in real time, and at any location in the company.

## Overviews

### SIMATIC PCS 7

#### Introduction

#### Overview

##### Central engineering

SIMATIC PCS 7 convinces with graded functional diversity, consistent operator control philosophy, and uniformly structured engineering and management tools. A central engineering system with a coordinated range of tools for integrated system engineering and configuring of batch automation, safety functions, material transport or telecontrol systems creates value added over the entire life cycle. Reductions in configuring and training costs result in minimization of total cost of ownership (TCO) over the entire plant life cycle.

##### Functional diversity

Depending on the typical process automation or customer-specific requirements, SIMATIC PCS 7 can be functionally expanded for the following, for example:

- Batch process automation (SIMATIC BATCH)
- Functional safety and protection functions (Safety Integrated for Process Automation)
- Route control for material transport (SIMATIC Route Control)
- Telecontrol of remote units (SIMATIC PCS 7 TeleControl)
- Automation of electrical switchgear (SIMATIC PCS 7 PowerControl)

##### **Custom automation**

The unique scalable system architecture makes SIMATIC PCS 7 the ideal basis for cost-effective implementation of individual automation solutions and a cost effective operation of process plants.

SIMATIC PCS 7 users receive sustainable benefits from the modular system platform, based on SIMATIC standard components. Its uniformity enables flexible scaling of hardware and software, as well as perfect interaction, both within the system and beyond system limits. The architecture of the process control system SIMATIC PCS 7 is designed in such a way that the control technology can be used for the project planning according to the customer's requirements, optimally adapted to the dimensions of the plant. The control technology allows retrofit or reconfiguration for capacity expansion or technological changes at any time. If the plant grows, then SIMATIC PCS 7 simply grows along with it – making expensive reserve capacities unnecessary!

Use the opportunities offered by the object-oriented type and instance concept of SIMATIC PCS 7. The technological connections, variant formation and bidirectional comparison of the types with the instances make the control module types (CMT) even more powerful compared to the original function block templates. The technological connections of a Control Module such as parameters, signals or messages can be provided with attributes and used via drag and drop, e.g. on an SFC plan. In turn, options and variants can be used to extend the core function of the CMT with specific modules or functions, which can be activated individually for each instance. This minimizes the number of types required and thus reduces the effort for maintenance and service. For the technological content of the CM types, the future-oriented Advanced Process Library (APL) is included in the standard of SIMATIC PCS 7. Another major advantage resulting from the comprehensive type and instance concept is the seamless integration into other tools like SIMATIC PCS 7 Plant Automation Accelerator or SIMIT.

##### **Flexibility and performance in engineering**

The workflow in the engineering of process plants is and remains a challenge: Numerous participants, many different data formats and multiple interfaces frequently result in transmission errors and system discontinuity and thus in greater time input and costs. Information generally gets lost or needs to be corrected manually when data is exchanged between multiple disciplines.

For the first time, a fully integrated solution is now available for planning and documenting plant projects: the SIMATIC PCS 7 Plant Automation Accelerator. Customers benefit in particular from consistent engineering without system discontinuities between automation planning and the control system.

The object-oriented approach of the SIMATIC PCS 7 Plant Automation Accelerator makes it possible to work on a central data platform, thus ensuring completely integrated planning – from plant engineering through to automation – based on an electronic workflow. This workflow ranges from planning, the preparation of bids – including bills of material – and the automatic generation of control data from the electrical plans of the SIMATIC PCS 7 process control system, through to controlled mass data engineering and direct as-is documentation of the plant.

This modular engineering approach enhances overall project efficiency and minimizes risks. A high level of standardization and simple configuration additionally save engineering time and costs during the implementation phase. Simple synchronization between planning and engineering avoids duplicate input and interface losses and reduces project runtimes.

##### **Flexibility in operation**

Process control also becomes more complex due to the multi-layer nature of automation engineering and the increased merging with information technology. Intuitive and fault-free operation is therefore more important than ever with regard to efficient working and the minimization of downtimes and servicing requirements. Using effective Advanced Process Control (APC) functions and an excellent operator system, SIMATIC PCS 7 supports optimization as well as user-friendly and safe control of the process. Monitoring of product quality and performance indicators additionally allows the process to be operated more economically. At the same time, SIMATIC PCS 7 convinces with high flexibility, plant availability, and investment security.

##### Process control and maintenance

SIMATIC PCS 7's operator system is used to monitor process operation using various views, and permits interventions when necessary. Its architecture is flexible and scalable – from single-user systems up to multi-user systems with a redundant client/server architecture. The operator interface takes account of the current specifications of NAMUR (user association of automation technology in the process industries) and PI (Profibus International) and offers a high level of user-friendliness for simple, intuitive interaction with the plant. Ergonomic symbols, task-oriented faceplates, uniform representation of status information, and optimized alarm functions allow safe process control.

### Overview

The alarm management function integrated in SIMATIC PCS 7 is able to focus on essential alarms and to specifically guide the operator in exceptional circumstances. In this way, it systematically reduces the workload of operating staff.

Preventive and predictive maintenance strategies reduce total cost of ownership. With the SIMATIC PCS 7 Maintenance Station, maintenance personnel always have a watchful eye on critical production equipment such as pumps, valves, distillation columns or motors, and can carry out the relevant maintenance measures in good time before servicing is required – independent of the maintenance plan and without the risk of an unplanned plant standstill.

#### Process optimization

SIMATIC PCS 7 supports process optimization in many different manners, including:

- Control Performance Monitoring
- Advanced Process Control
- Process Historian

The Control Performance Monitoring function monitors and signals the control quality of the closed-loop control block. If the performance declines, the controller can be optimized in good time or specific maintenance measures can be initiated.

The integrated I&C libraries of SIMATIC PCS 7 also provide higher quality closed-loop control functions with which cost-effective Advanced Process Control applications can be implemented: multi-variable control, predictive control, or override control. It is thus possible to effectively improve profitability, product quality, safety, and environmental protection in small and medium-sized plants.

Current and historic process data form the basis of all optimization. Secure and user-friendly real-time data storage and analysis is handled using the Process Historian. The process values, messages, and batch data managed in the database of the Process Historian can be called extremely rapidly. User-specific processing and visualization of this historic data are supported by the information server, which is a reporting system based on the Microsoft Reporting Services.

#### **SIMATIC PCS 7 system and technology components**

With the rugged, high-performance SIMATIC PCS 7 system components from Catalog ST PCS 7, you already have a versatile platform for cost-effective implementation and economical operation of your process control systems. Perfect interplay of these system components makes it possible for you to sustain high-quality production and to establish new products significantly faster on the market.

With SIMATIC PCS 7 technology components from Catalog ST PCS 7 T that can be seamlessly integrated into the process control system, you can expand the functional scope of the system components in a carefully targeted manner for specific automation tasks.

This covers a wide spectrum, for example:

- Telecontrol for monitoring and controlling remote plant units
- Automation technology for electrical low-voltage or medium-voltage switchgear
- Industry-specific automation systems for the cement and mining industries, as well as for laboratory and training facilities
- Graphical objects for task-oriented optimization of process visualization
- Block libraries for technological functions, package unit and panel integration, monitoring and analyzing mechanical assets, as well as for building automation systems (heating, ventilation, air-conditioning – FMCS/HVAC)
- Editors and function blocks for the efficient configuration of small or medium-sized automation systems with simple parameter control and materials management
- Process analytical technology for quality assurance through optimization of development and production processes based on up-to-date measurements, and critical quality and performance attributes
- Simulation system for testing and commissioning of plant-specific application software
- Flexible, high-performance Manufacturing Execution System (MES)
- System expansion for operator systems for the integration of third-party controllers, programmable logic controllers and package units
- Products for migration of the process control systems TELEPERM M, APACS+/QUADLOG or Bailey INFI 90/NET 90 with SIMATIC PCS 7

#### **Additional functionality can be integrated using add-on products**

Modularity, flexibility, scalability, and the openness of SIMATIC PCS 7 offer optimal prerequisites for integrating supplementary components and solutions in the process control system in an applicative manner and thus extend and round off its functionality.

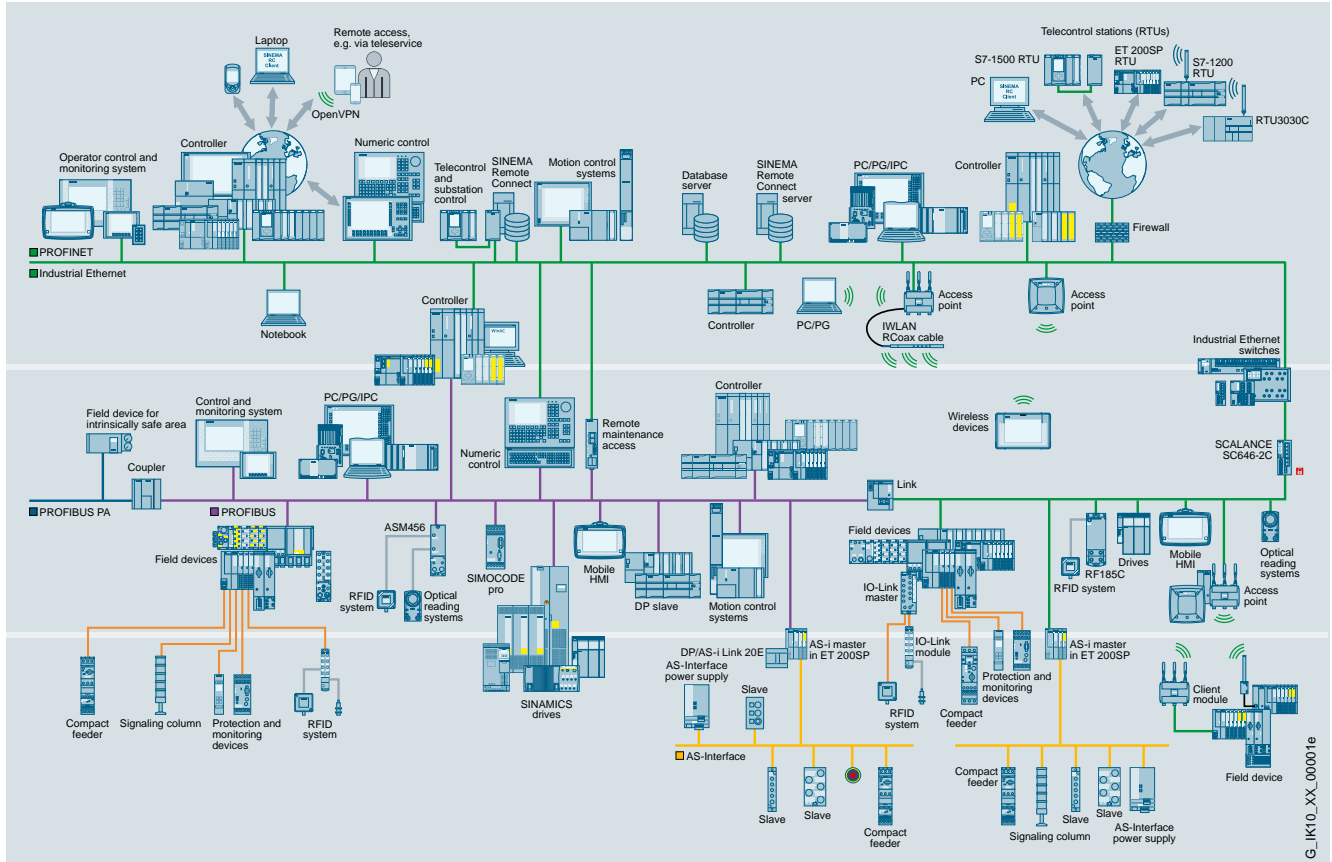
Many supplementary add-on products for SIMATIC PCS 7 have been developed by Siemens as well as by external partners (see Catalog ST PCS 7 AO, Add-ons for the SIMATIC PCS 7 Process Control System). These software packages and hardware components authorized by the system manufacturer enable cost-effective implementation of SIMATIC PCS 7 for special automation tasks.

# Overviews SIMATIC NET

## Introduction

### Overview

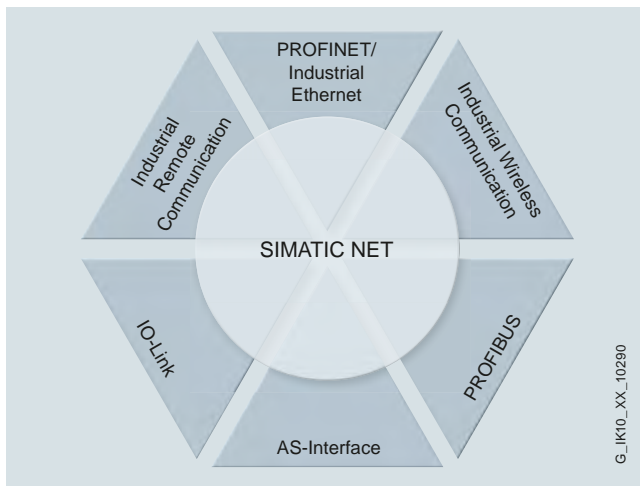
#### **SIMATIC NET** *Industrial communication – the backbone of automation*



Powerful and open communication systems ensure trouble-free communication for automation systems, covering

- data communication or
- process or field communication.

Openness and flexibility of the individual communication systems in different topologies enable linking of a wide variety of systems and their subsequent expansions. By using standardized communication systems, it is possible to connect standardized components from different suppliers without any problems. This ensures maximum protection of investment, as existing networks can be extended without any adverse effects.

**Overview**

**More information**

- Internet:  
[www.siemens.com/industrial-communication](http://www.siemens.com/industrial-communication)

SIMATIC NET provides components for an integrated overall solution beyond network boundaries.

These include:

- Passive network components, e.g. FastConnect cabling systems
- Active network components, e.g. SCALANCE X Industrial Ethernet switches as well as RUGGEDCOM devices for harsh ambient conditions.
- Interfaces for connecting programmable controllers to the communication systems:
  - Integrated interfaces
  - Communications processors
- Components for wireless networks, e.g. Industrial Wireless LAN, SCALANCE W Access Points, and Client Modules (incl. latest Wi-Fi 6 devices) as well as first 5G components
- Components for industrial security, e.g. network security with Industrial Security Appliances SCALANCE S
- Components for Industrial Remote Communication, worldwide access to outlying plants, distant machines, and for mobile applications such as TeleControl.
- Simple remote access for TeleService and remote maintenance with SCALANCE M and SINEMA Remote Connect
- Network transitions, e.g. IE/PB LINK PN IO
- Components for AS interface
- SINEC software family for efficient network management

# Overviews

## SIMATIC Ident

### Introduction

#### Overview

**Let the data journey begin.**

**SIMATIC Ident: Industrial Identification for company-wide data intelligence**

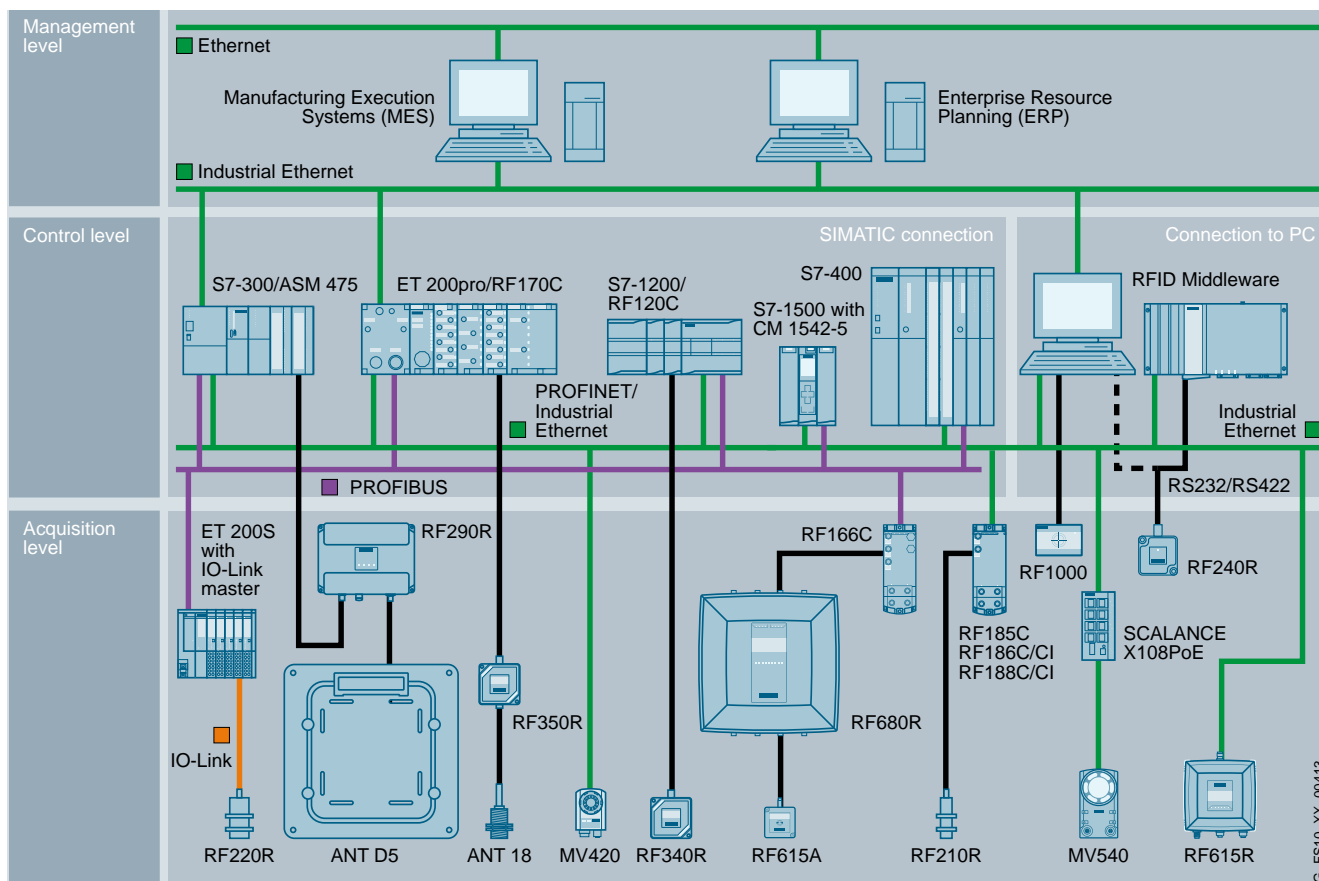
Small batch sizes, a wide range of increasingly complex products, an extremely high degree of customization and complicated processes present major challenges for industry.

For all these challenges Siemens offers SIMATIC Ident, a unique integrated and scalable range of RFID and optical identification systems. These enable virtual data flows from IT systems to be synchronized with the actual flow of goods – throughout the value chain. This provides the necessary clarity and answers the question: When is which product in which location and what is its status? Because data transparency is becoming an increasingly central factor of success, especially in the industrial environment.

With SIMATIC Ident, quality requirements can be reliably met, production can be more flexibly structured, the number of manual operations reduced, and potential sources of faults identified and removed immediately. This means greater efficiency in logistics, material management, production, and service. For competitiveness and for a flexible future.

In addition, SIMATIC Ident supplies production data to cloud applications, e.g. MindSphere – the cloud-based, open IoT operating system from Siemens..

This makes SIMATIC Ident a key technology for the digital enterprise. Our solutions close the gap between the real and the digital world – and open up new added value potential for our customers.



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**Overview**
RFID systems


Openness and flexibility of the individual communication systems in different topologies enable linking of a wide variety of systems and their subsequent expansions. By using standardized communication systems, it is possible to connect standardized components from different suppliers without any problems. This ensures maximum protection of investment, as existing networks can be extended without any adverse effects.

Line of sight between the write/read device and the transponder is not necessary. Rugged, compact readers in a high degree of protection with either integrated or external antennas are available for interference-free data communication. Cost-efficient, maintenance-free, passive labels and passive transponders in various designs and with various memory capacities are likewise available, as are powerful antennas.

Optical identification systems


The SIMATIC MV optical readers are powerful, intelligent reading devices for both standard, high-contrast 1D/2D codes as well as difficult-to-read DPM codes applied straight onto the different product surfaces. The optical readers also permit text recognition, object recognition, and inspection of marking quality. The readers of the SIMATIC MV family boast powerful image acquisition capabilities for different resolutions and integrated lighting, allowing them to be used in a range of applications. device configuration via web-based management and system integration via the TIA Portal ensure easy handling.

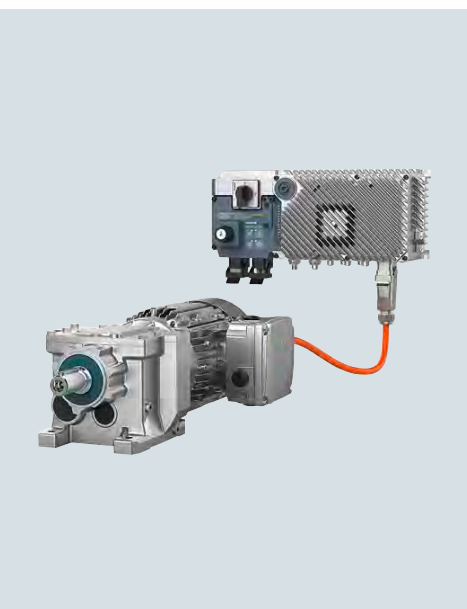
**More information**

- Internet:  
[www.siemens.com/simatic-ident](http://www.siemens.com/simatic-ident)  
[www.siemens.com/rtls](http://www.siemens.com/rtls)

## Overviews

### Notes

## Supplementary Components



<b>16/2</b> 16/2	<b>Drive systems</b> SINAMICS drive system
<b>16/16</b> 16/16	<b>Overvoltage protection</b> SICROWBAR overvoltage protection
<b>16/17</b> 16/17	<b>Timing, coupling and monitoring relays</b> SIRIUS relays
<b>16/19</b> 16/19	<b>Measuring systems</b> Motion Control Encoder measuring systems
<b>16/20</b> 16/20 16/21 16/21 16/22 16/23 16/24	<b>Automation systems</b> SIMOTION Motion Control System SINUMERIK CNC automation systems - SINUMERIK 828D - SINUMERIK 840D sl - SINUMERIK ONE - SINUMERIK MC
<b>16/25</b> 16/25	<b>System cabling</b> MOTION-CONNECT connection systems

# Supplementary components

## Drive systems

### SINAMICS drive system

#### Overview

#### The SINAMICS range



- Totally integrated range of drives for any application and every industry
- Wide range of power ratings from 0.05 kW to 85 MW
- Broad functional scope, from simple U/f control through to highly dynamic servo control
- Designed for problem-free interaction with other Siemens automation components
- Shared platform concept with uniform functionality, engineering, commissioning, operation as well as a uniform diagnostics concept and communication mechanisms

Low voltage										Direct voltage	Medium voltage
Standard performance frequency converters		Distributed frequency converters	Industry-specific frequency converters		Servo drives			High performance frequency converters		DC converters	Converters for applications with high outputs
SINAMICS V20 G120C G120	SINAMICS G130 G150	SINAMICS G115D G120D SIMATIC ET 200pro FC-2	SINAMICS G120X	SINAMICS G180	SINAMICS V90	SINAMICS S110	SINAMICS S210	SINAMICS S120 S120M	SINAMICS S150	SINAMICS DCM DCP <sup>1)</sup>	SINAMICS GH150 GH180 GM150 SM150 GL150 SL150 SM120CM
0.12 kW to 250 kW	75 kW to 2700 kW	0.37 kW to 7.5 kW	0.75 kW to 630 kW	2.2 kW to 6600 kW	0.05 kW to 7 kW	0.55 kW to 132 kW	0.05 kW to 7 kW	0.55 kW to 5700 kW	75 kW to 1200 kW	6 kW to 30 MW	0.15 MW to 85 MW
Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines, refrigerated display counters, fitness equipment, ventilation systems, single-axis positioning applications in machine and plant engineering	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders	Conveyor technology, single-axis positioning applications (G120D)	Pumps, fans, compressors, building management systems, process industry, HVAC, water/waste water industries	Pumps, fans, compressors, conveyor belts, extruders, mixers, mills, kneaders, centrifuges, separators	Handling machines, packaging machines, automatic assembly machines, metal forming machines, printing machines, winding and unwinding units	Single-axis positioning applications in machine and plant engineering	Packaging machines, handling equipment, feed and withdrawal devices, stacking units, automatic assembly machines, laboratory automation, wood, glass and ceramics industry, digital printing machines	Production machines (packaging, textile and printing machines, paper machines, plastic processing machines), machine tools, plants, process lines and rolling mills, marine drives, test bays	Test bays, cross cutters, centrifuges	Rolling mill drives, wire-drawing machines, extruders and kneaders, cableways and lifts, test bay drives	Pumps, fans, compressors, mixers, extruders, mills, crushers, rolling mills, conveyor technology, excavators, test bays, marine drives, blast furnace fans, retrofit
Catalog D 31.1	Catalog D 11	Catalog D 31.2	Catalog D 31.5	Catalog D 18.1	Catalog D 33	Catalog D 31.1	Catalog D 32	Catalogs D 21.3, D 21.4 NC 62	Catalog D 21.3	Catalog D 23.1, Industry Mall	Internet <sup>2)</sup>

Engineering tools (e.g. Drive Technology Configurator, SIZER for Siemens Drives, STARTER and SINAMICS Startdrive)

<sup>1)</sup> DC/DC controllers, see Industry Mall.

<sup>2)</sup> [www.siemens.com/medium-voltage-converter](http://www.siemens.com/medium-voltage-converter)

## Overview

**SINAMICS V20 –  
the perfect solution for basic applications**

- Power range from 0.12 kW to 30 kW
- Voltage:
  - 230 V 1 AC: 200 V to 240 V 1 AC (-15 % to +10 %)
  - 400 V 3 AC: 380 V to 480 V 3 AC (-15 % to +10 %)
- Integrated USS and Modbus RTU interfaces
- Integrated braking module for 7.5 kW to 30 kW
- Parameter readout and cloning without power supply
- Integrated connection and application macros
- ECO mode for  $U/f$ ,  $U^2/f$
- Integrated hibernation mode in idle state
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS V20 Smart Access web server module
- Expansion of 400 V converters with two digital inputs and two digital outputs (relay outputs) thanks to optional SINAMICS V20 I/O Extension Module
- SINAMICS CONNECT 300 for connecting up to eight converters to the MindSphere cloud

More information

- Catalog D 31.1
- Internet:
  - <http://www.siemens.com/sinamics-v20>
  - <http://www.siemens.com/d31-1>
  - <http://www.siemens.com/industrymall>

**SINAMICS V90 basic servo drive system –  
the performance-optimized, easy-to-operate  
servo drive system**

- SINAMICS V90 and SIMOTICS S-1FL6 form an optimized servo drive system for positioning as well as speed and torque control. Thanks to the optimized design, the system permits enhanced servo performance combined with a high level of ruggedness in a simple, low-cost way.
- SINAMICS V90 is designed for all-purpose servo applications while taking into consideration the challenges for machine builders and system integrators in terms of costs and time-to-market.
- The SINAMICS V90 system can essentially be commissioned effortlessly by means of a simple plug-and-play procedure. The SINAMICS V90 drive offers optimum servo performance, can be integrated quickly into SIMATIC PLCs and provides a high level of reliability. The connection can be made via PROFINET, by means of a pulse-direction interface or via analog inputs/outputs. A seamless drive system can be created by combining the SINAMICS V90 servo drive with our SIMOTICS S-1FL6 servomotor.
- SINAMICS V90 offers internal positioning, positioning with pulse sequence, and speed and torque control.
- With integral auto-tuning in real time and automatic suppression of machine resonances, the system automatically optimizes itself to achieve a highly dynamic performance and smooth operation. In addition, it makes it easier for the pulse sequence input to achieve excellent positioning accuracy on the basis of its high frequency limit of up to 1 MHz.

More information

- Catalog D 33
- Internet:
  - <http://www.siemens.com/sinamics-v90>
  - <http://www.siemens.com/d33>
  - <http://www.siemens.com/industrymall>

## Supplementary components

### Drive systems

#### SINAMICS drive system

##### Overview

#### **SINAMICS G120P – the specialist for pumps, fans, and compressors**



- Power range from 0.37 kW to 630 kW
- Automatic switchover to line operation at rated speed
- Variety of functions for pumps, fans and compressors, e. g. energy-saving mode, Pt1000/LG-Ni1000/DIN-Ni1000 temperature sensor interface, cascade connection, programmable time switches, bypass mode, multi-zone control
- Communication: RS 485, USS, Modbus RTU, BACnet MS/TP, FLN P1, PROFINET, EtherNet/IP, PROFIBUS DP
- Integrated in the TIA Portal with SINAMICS Startdrive
- Energy efficient through minimal apparent power losses, automatic adaptation of the motor current to the actual load conditions with ECO mode

##### More information

- Catalog D 35
- Internet:  
<http://www.siemens.com/sinamics-g120p>  
<http://www.siemens.com/d35>  
<http://www.siemens.com/industrymall>

#### **SINAMICS G120X – the infrastructure converter for HVAC/water/wastewater**



- Power range from 0.75 kW to 630 kW
- The specialist for pump, fan and compressor applications
- Thanks to the integrated DC link reactor with a maximum output of 250 kW and optional resistance to harmful gases up to environmental class 3C3, the rugged and dependable design ensures reliable, stable and largely robust operation.
- Variety of functions relevant for pumps, fans and compressors, e.g. deragging or pipe fill mode, automatic restart, flying restart, flux reduction, cascade connection, hibernation mode and real-time clock
- Functions especially for building technology as well as heating/air conditioning/ventilation applications, e.g. four integrated PID controllers, essential service mode, bypass mode and programmable time switches
- Communication: PROFINET, EtherNet/IP, PROFIBUS DP, USS, Modbus RTU, BACnet MS/TP
- SINAMICS CONNECT 300 for connecting up to eight converters to the MindSphere cloud
- Innovative hardware and software functions for saving energy, e.g. for controlling synchronous reluctance drive systems with SIMOTICS reluctance motors

##### More information

- Catalog D 31.5
- Internet:  
<http://www.siemens.com/sinamics-g120x>  
<http://www.siemens.com/d31-5>  
<http://www.siemens.com/industrymall>

**Overview**

**SINAMICS G120C –  
the compact and versatile frequency converter with  
optimum functionality**



- Compact unit
- Highest power density in its class
- Power range from 0.55 kW to 132 kW
- Easy commissioning and maintenance
- With BOP-2 or IOP-2 operator panel
- Safety Integrated: STO
- Available communication: PROFIBUS DP, USS, Modbus RTU, PROFINET, EtherNet/IP
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS G120 Smart Access web server module
- SINAMICS CONNECT 300 for connecting up to eight converters to the MindSphere cloud
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.1
- Internet:  
<http://www.siemens.com/sinamics-g120c>  
<http://www.siemens.com/d31-1>  
<http://www.siemens.com/industrymall>

**SINAMICS G120 –  
the modular single-motor drive for low to medium  
power ratings**



- Power range from 0.37 kW to 250 kW
- Safety Integrated: STO, SS1, SBC, SLS, SDI and SSM encoderless
- Communication via PROFIBUS, PROFINET, EtherNet/IP, RS485, USS, Modbus RTU, CANopen, BACnet MS/TP
- Energy efficient thanks to regenerative feedback and low line harmonic distortion
- Parameter copy function for standard commissioning
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS G120 Smart Access web server module
- SINAMICS CONNECT 300 for connecting up to eight converters to the MindSphere cloud
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.1
- Internet:  
<http://www.siemens.com/sinamics-g120>  
<http://www.siemens.com/d31-1>  
<http://www.siemens.com/industrymall>

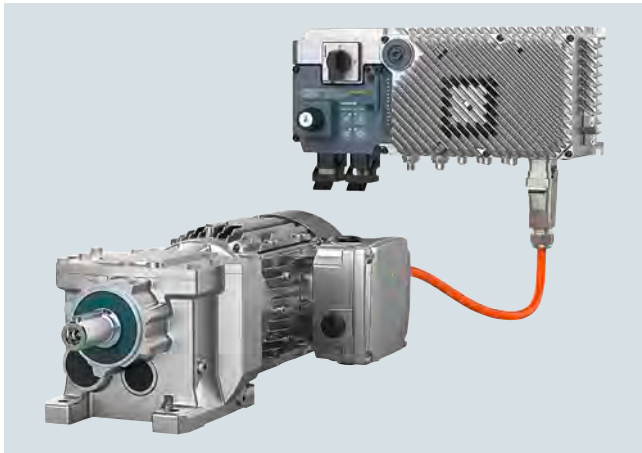
## Supplementary components

### Drive systems

#### SINAMICS drive system

##### Overview

#### **SINAMICS G115D – the distributed wall-mounted or motor-mounted drive system**



Example: SINAMICS G115D distributed drive system, wall-mounted

The SINAMICS G115D distributed drive system meets all the requirements that system manufacturers place on drives for applications in conveyor technology with a focus on the intralogistics and airport industries as well as for simple, horizontal applications in the automotive and food and beverage industries. The converter is supplied with degree of protection up to IP66 and sets standards in terms of efficiency – from the installation phase to commissioning and all the way to handling. The SINAMICS G115D drive system is the first choice for users who want to move conveyed material quickly and efficiently.

Integration via PROFINET communication with PROFIsafe, AS-Interface, EtherNet/IP into a higher-level control system is very easy thanks to full TIA Portal integration, which provides a tool as well as an operating and data management concept. In addition, an optional web server module is available with the web server module SINAMICS G120 Smart Access (SAM) – a WLAN-based web server solution for simple and fast wireless setup with tablets or smartphones during commissioning and for diagnostics.

##### More information

- Catalog News D 31.2 N
- Internet:  
<http://www.siemens.com/sinamics-g115d>  
<http://www.siemens.com/d31-2n>  
<http://www.siemens.com/industrymall>

#### **SINAMICS G120D – the distributed single drive for high-performance solutions**



- Positioning capability
- Power range from 0.75 kW to 7.5 kW
- Energy-efficient due to regenerative feedback and low line harmonic distortion
- Safety Integrated: STO, SS1, SDI, SSM and SLS encoderless
- Thanks to the modular design, electronics stocks are minimal
- Interchangeable memory card
- Communication via PROFIBUS DP, PROFINET, EtherNet/IP
- Integrated in the TIA Portal with SINAMICS Startdrive

##### More information

- Catalog D 31.2
- Internet:  
<http://www.siemens.com/sinamics-g120d>  
<http://www.siemens.com/d31-2>  
<http://www.siemens.com/industrymall>



## Overview

### **SINAMICS G130/SINAMICS G150 – the universal frequency converters for high-performance single drives**



- Available as a standardized control cabinet or built-in units
- Output range from 75 kW to 800 kW or 2700 kW with parallel switching
- Specially for drives with quadratic and constant load characteristics, medium performance requirements, but no regenerative feedback capability
- Service-friendly thanks to easy-to-access device modules
- Communication via PROFIBUS DP, PROFINET, EtherNet/IP, CANopen
- Energy-efficient due to variable-speed operation
- Sensorless vector control
- Safety Integrated: STO, SBC, SS1 with SBR/SAM; SLS, SSM, SDI, SBT
- Simple commissioning and parameterization via the AOP30 Advanced Operator Panel or PC-supported using the STARTER IOP commissioning tool

#### More information

- Catalog D 11
- Internet:
  - <http://www.siemens.com/sinamics-g130>
  - <http://www.siemens.com/sinamics-g150>
  - <http://www.siemens.com/d11>
  - <http://www.siemens.com/industrymall>



## Supplementary components

### Drive systems

#### SINAMICS drive system

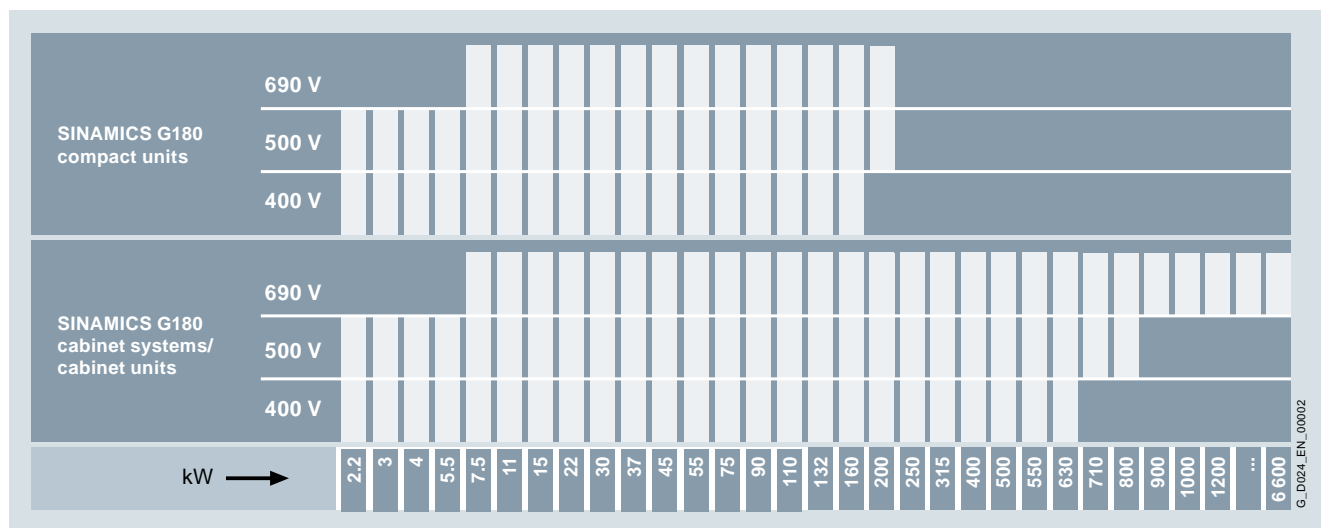
##### Overview

### **SINAMICS G180 – the specific converter for the oil & gas, chemical and process industries**



The LOHER DYNAVERT T frequency converter integrated as SINAMICS G180 into the SINAMICS range has been deployed for over forty years for applications where maximum reliability and availability of the drive are of paramount importance.

SINAMICS G180 converters can be supplied for standard voltages 400, 500 and 690 V in the power range up to 6.6 MW. They are available as a compact unit, a cabinet system or a cabinet unit, with air or liquid cooling, for operation with synchronous and asynchronous motors.



- A wide range of add-on electrical components allow the drive system to be optimized for specific requirements
- Simplified configuring and shortened commissioning due to predefined interfaces and pre-parameterized factory settings
- Sensorless vector control without additional speed actual value encoder (encoder evaluation units are available if required)
- Can be flexibly integrated in all automation concepts
- Communication: Apart from the standard converter interface (compliant with Namur NE37), PROFINET, PROFIBUS DP, Modbus RTU, Modbus TCP, CANopen can also be used optionally

Optionally available peripheral boards can be selected to add the following inputs/outputs to the converter:

- Digital and analog inputs and outputs
- 2 PTC thermistor inputs for ATEX-certified motor temperature monitoring for motors in hazardous zones (prewarning/trip)

##### More information

- Catalog D 18.1
- Internet:
  - <http://www.siemens.com/sinamics-g180>
  - <http://www.siemens.com/sinamics-g150>
  - <http://www.siemens.com/d18-1>
  - <http://www.siemens.com/industrymall>

**Overview**
**SINAMICS S210 –  
 the single-axis servo drive for highly dynamic applications**


The new servo drive system comprises a SINAMICS S210 servo converter, a SIMOTICS S-1FK2 servomotor and a matching One Cable Connection (OCC) for connecting the motor to the converter. The SINAMICS S210 is a single-axis AC/AC servo converter system with high performance and dynamic response for mid-range Motion Control applications.

SINAMICS S210 servo converters are available for line voltages of 200 ... 240 V 1 AC (1 AC series) and 200 ... 480 V 3 AC (3 AC series), and the SIMOTICS S-1FK2 servomotors for a torque range from 0.16 ... 3.2 kW with shaft heights of 20 mm, 30 mm and 40 mm in High Dynamic (HD) and Compact (CT) versions.

More information

- Catalog D 32
- Internet:  
<http://www.siemens.com/sinamics-s210>  
<http://www.siemens.com/d32>  
<http://www.siemens.com/industrymall>

**SINAMICS S110 –  
 the specialist for simple positioning tasks**


- Servo control
- Power range from 0.55 kW to 132 kW
- Safety Integrated
- Integrated positioning functions
- Straightforward system interface with higher-level controllers (e.g. PLC) with PROFIBUS DP or PROFINET

More information

- Catalog D 31.1
- Internet:  
<http://www.siemens.com/sinamics-s110>  
<http://www.siemens.com/d31-1>  
<http://www.siemens.com/industrymall>

## Supplementary components

### Drive systems

#### SINAMICS drive system

##### Overview

**SINAMICS S120 – the flexible, modular drive system for demanding single-axis and multi-axis applications from the low-end to the high-end performance range**



- Modular drive system for single-axis and multi-axis applications in all areas of machine and plant manufacturing
- Servo/vector control, U/f control
- Power range from 0.12 kW to 5700 kW
- Various types of construction for different application areas
- Highly flexible due to, for example, modular system architecture, different cooling methods, support for a wide range of motors/encoders, easy expansion
- High degree of scalability with regard to performance, number of axes, functionality
- Integrated safety functions
- Comprehensive motion control functionality
- High availability and efficiency, even in unstable networks
- Automatic parameterization and easy drive commissioning/optimization

##### More information

- Catalogs D 21.3, D 21.4
- Internet:
  - <http://www.siemens.com/sinamics-s120>
  - <http://www.siemens.com/d21-3>
  - <http://www.siemens.com/d21-4>
  - <http://www.siemens.com/industrymall>



**Overview**
**SINAMICS S150 –  
 the sophisticated drive solution for single drives in the  
 medium to top performance ranges**


- Particularly suitable for applications with high requirements regarding precision and dynamic response in the mid to upper performance range, as well as for frequent braking cycles with high braking energies and four-quadrant operation
- Ready-to-operate control cabinet
- Power range from 75 kW to 1200 kW
- Straightforward configuring and commissioning provided by the SIZER for Siemens Drives and STARTER engineering tools
- High availability and efficiency, even in unstable networks
- Efficient operation through standard energy recovery
- Line-friendly operation thanks to Clean Power Filter (line feedback < 1 %)
- Reactive power compensation possible
- Equipped as standard with PROFIBUS DP interface for connection to higher-level controls

More information

- Catalog D 21.3
- Internet:  
<http://www.siemens.com/sinamics-s150>  
<http://www.siemens.com/d21-3>  
<http://www.siemens.com/industrymall>

**SINAMICS DCP –  
 the compact DC/DC converter for smart applications**


With the SINAMICS DCP, Siemens is offering a new generation of bidirectional DC/DC converters. In these, Siemens is combining its expertise in DC technology with the advantages of the well-proven SINAMICS family. SINAMICS DCP is setting new standards when it comes to quality, reliability and technical functionality.

The SINAMICS DCP is suitable for industrial and multi-generator applications in the renewable energy sector. As a bidirectional boost and buck converter with scalable power rating, it combines multiple functions in one single device. With variable voltage levels, current can flow in both directions. This makes the SINAMICS DCP ideal for charging and discharging batteries and supercapacitors.

Special features

- Bidirectional boost and buck converter in one unit
- High efficiency
- High switching frequency
- Compact: The reactor, power unit and control station form one unit

Software feature

- Voltage and current regulation
- 3 overload profiles
- Stable voltage in the DC link
- Voltage control
- Overload capability
- Temperature-controlled fans (only for DCP 120 kW)
- Incorporated MPPT (Maximum Power Point Tracker)
- No-load voltage limitation of a PV field
- Battery charging characteristic
- Communications interfaces: EtherNet/IP, Modbus TCP, PROFIBUS, PROFINET

The functionality can be expanded with other SINAMICS components such as Active Line Modules.

More information

- Internet:  
<http://www.siemens.com/dc-dc-converter>  
<http://www.siemens.com/d23-1>  
<http://www.siemens.com/industrymall>

## Supplementary components

### Drive systems

#### SINAMICS drive system

##### Overview

#### **SINAMICS DCM – the scalable drive system for basic and sophisticated DC drive applications**



- Power range 6 kW to 30 MW
- For machinery and plants in industry
  - Steel/aluminum
  - Plastic
  - Printing
  - Paper
  - Hoisting gear
  - Mining
  - Oil and gas
  - Static excitation units
  - Heating applications
  - Magnet applications
- New systems and retrofit business
- Communication as standard via PROFIBUS DP, RS485 or USS, and optionally via PROFINET, EtherNet/IP or Modbus RTU
- Safety Integrated: STO, SS1 acc. to IEC 61508 SIL 3 as well as EN ISO 13849-1 PL e
- Control unit variance
- Field power supply in line with requirements
- Electronics power supply for connection to 24 V DC
- Power unit isolated to ground (isolated voltage sensing)
- Free function blocks and Drive Control Chart (DCC)
- Expandable functionality using SINAMICS components
- Single-phase operation possible
- Coated modules and nickel-plated copper busbars
- Wide temperature range
- High overload capability
- Low torque ripple at low speeds
- Very compact design

##### More information

- Catalog D 23.1
- Internet:
  - <http://www.siemens.com/sinamics-dcm>
  - <http://www.siemens.com/d23-1>
  - <http://www.siemens.com/industry mall>

#### **SINAMICS PERFECT HARMONY GH180**



##### Core Applications

- Single and multi-motor applications (sync transfer) such as pumps, fans, compressors, mills, crushers, conveyor systems, retrofit projects, etc.

##### Product Highlights

- Integrated and optimized drive and transformer design – Minimized plant footprint, combined cooling system and plug-and-play drive system setup.
- Over 16,000 drives sold worldwide – The most trusted and proven drive on the market today with installations in every major process industry.
- Extremely motor-friendly – Capable of being configured with virtually any motor thanks to an almost sinusoidal output voltage
- Cell bypass, cell redundancy and blower redundancy – Maximize process availability thanks to its Advanced Cell Bypass feature for maintaining a balanced output voltage without torque or speed reductions.

##### More information

- Internet:
  - <http://www.siemens.com/sinamics-perfect-harmony-gh180>

**Overview**
**SINAMICS PERFECT HARMONY GH150**

**Core Applications**

- Single motor applications such as pumps, fans, compressors, conveyor systems (uphill) and retrofit projects.

**Product Highlights**

- Transformer flexibility – Able to utilize separate dry type or oil-filled standard converter transformers or high primary voltages or number of pulses
- Flexible cooling arrangement perfect for any installation requirements – Water or air cooled design, duct air outside, use integral or separate air-to-air or integral air-to-water heat exchanger, stand alone control cabinet.
- Extremely motor-friendly – Capable of being configured with virtually any motor thanks to an almost sinusoidal output voltage up to 13.8 kV.
- Cell bypass and cell redundancy – Maximize process availability thanks to a high speed cell bypass feature for maintaining a balanced output voltage without torque or speed reduction.

**More information**

- Internet: <http://www.siemens.com/sinamics-perfect-harmony-gh150>

**SINAMICS GM150**

**Core Applications**

- Single-motor applications such as basic pump, fan and compressors applications, and mine hoists, especially in marine and offshore applications.

**Product Highlights**

- Easy to maintain and operate safely and reliably – Fuseless, tested arc proof design.
- Optimized footprint and design – Compact, rugged; saves costs and space.
- Common housing / system for IGBT and IGCT cooling principles – Freely selected based on customer needs to meet requirements.
- Transformer flexibility – Able to utilize dry type or oil-filled standard converter transformers or high primary voltages or number of pulses.

**More information**

- Internet: <http://www.siemens.com/sinamics-gm150>

## Supplementary components

### Drive systems

#### SINAMICS drive system

##### Overview

##### **SINAMICS GL150**



##### Core Applications

- Mainly used in large high-power and high-speed applications such as pumps, fans, compressors, main marine propulsion, extruders and rolling mills, boiler feed pumps, wire rod mills, starting generators, pump storage and starting applications (e.g., blast furnaces).

##### Product Highlights

- Compared to VSI drives, most cost-competitive solution for large power ratings – Power density per M2.
- Mature and proven LCI topology – With over 40 years of experience and large installed base.
- Rugged and compact design for complex high-power applications – Fault tolerant, high MTBF, utilized in marine, starting and high-power applications, most rugged thyristor technology. Regenerative capability for energy-saving drive system solutions.

##### More information

- Internet: <http://www.siemens.com/sinamics-gl150>

##### **SINAMICS SH150**



##### Core Applications

- Special applications such as shaft generators on ships, onshore power supply for ships and offshore platforms, regenerating test stands, 50/60 Hz grid coupling, VAR compensation by AFE-drives.

##### Product Highlights

- Extremely motor- and line-friendly – Motors of literally any type - old or new - can be operated with standard winding insulation without additional stress. Transformer-less connection to local grids on request.
- Active Front End (AFE) for grid applications – Dedicated U/f droop control to create an island grid or to co-supply together with other generators. Additionally supply dynamic reactive power for voltage stabilization (STATCOM).
- Active Front End (AFE) for regenerating motors – Simultaneous 2Q or 4Q operation and grid VAR compensation with AFE and motor-side inverter. Also for rotating generators.
- Robust & reliable – Cell redundancy with automatic cell bypass for increased availability. Marine classification for ship and offshore applications.

##### More information

- Internet: <http://www.siemens.com/sinamics-sh150>



**Overview**
**SINAMICS SM150**

**Core Applications**

- Single- and multi-motor applications such as mills, crushers, conveyor belts, test stands, rolling mills and mine hoists.

**Product Highlights**

- 4-quadrant operation – Regenerative capability for energy-saving drive system solutions.
- Single- and multi-motor capability – Utilizing a common DC link.
- Optimized footprint and design – Compact, rugged; saves costs and space.
- High dynamic performance

**More information**

- Internet: <http://www.siemens.com/sinamics-sm150>

**SINAMICS SL150**

**Core Applications**

- Perfect for complex high-torque and low-speed applications such as rolling mills, mine hoists, mine winders, ore and cement crushers, excavators and conveyors

**Product Highlights**

- Fewest drive components for any given power rating - Low component variety to reduce capital investment and associated costs for storage and logistics.
- Compact and rugged design for extreme environments - High altitudes, temperatures and air quality, plus service friendliness for remote areas.
- Optimal configuration and operation - Integrated test routines, feedback and self-diagnostics, including thyristors, improved commissioning and tuning.
- Use of standard HV cable due to the typical low switching speed of thyristors (no screened or armored cables required).

**More information**

- Internet: <http://www.siemens.com/sinamics-sl150>

## Supplementary Components

### Overvoltage protection

#### SICROWBAR overvoltage protection

##### Overview

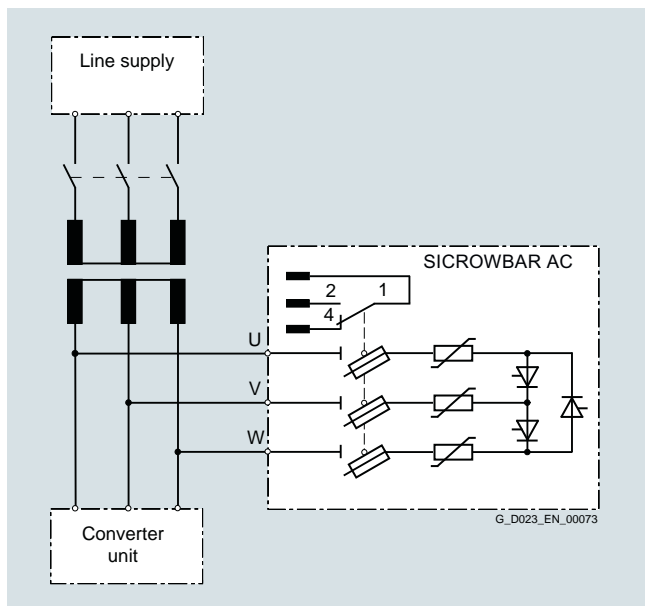
##### SICROWBAR AC



**SICROWBAR AC** is used to protect power semiconductors in converters (thyristors and diodes) against overvoltage that occurs between the phases of a three-phase network. The range of applications is not restricted to protecting DC drive converters, but also comprises infeed/regenerative feedback units of the AC drive technology that are equipped with thyristors.

Overvoltage that occurs on the AC side of converters is mainly caused by switching operations when disconnecting from the line supply at the transformer's primary side. This applies both to operational switching operations (shutdown at no-load) as well as in the case of a fault (shutdown under load).

The overvoltage protection is mainly used in the following configuration:



##### More information

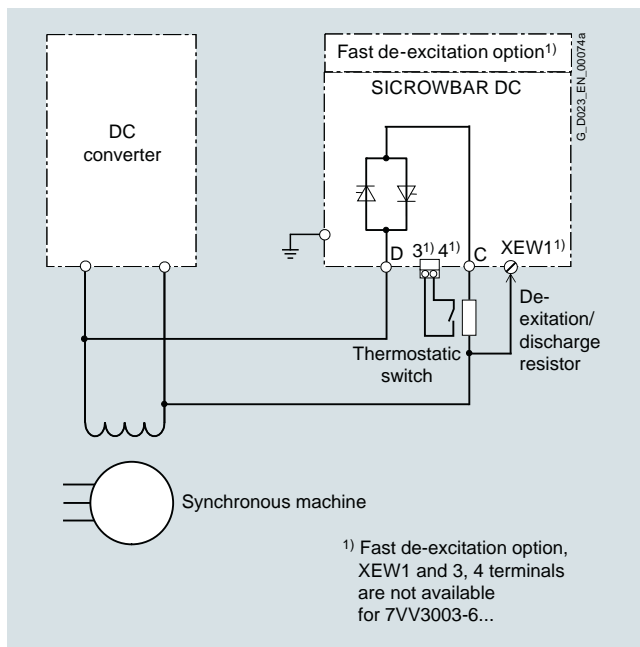
- Catalog D 23.1
- Internet:  
<http://www.siemens.com/sinamics-dcm>  
<http://www.siemens.com/industrymall>

##### SICROWBAR DC



**SICROWBAR DC** protects coils and converters against overvoltage conditions when they are used to supply large inductances, for instance, the excitation coils of synchronous machine motors, DC machine motors or hoisting solenoids. An appropriate de-excitation/discharge resistor must be provided. A thermostatic switch can be ordered as an option for the resistor from the manufacturer.

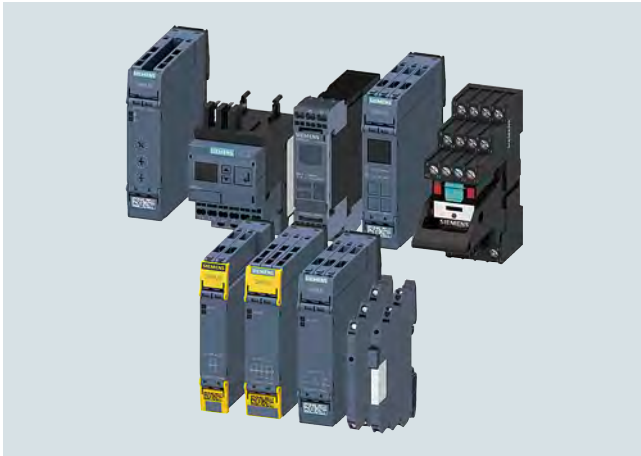
The fast de-excitation option G11 (module 7VV3003-7FG00) makes it possible to initiate fast de-excitation, triggered by a higher-level signal, for the 7VV3003-5... units.



##### More information

- Catalog D 23.1
- Internet:  
<http://www.siemens.com/sinamics-dcm>  
<http://www.siemens.com/industrymall>

#### Overview



#### SIRIUS relays – one range for every application

Our range of SIRIUS relays offers you everything you need for a motor feeder application. Easy and convenient – and all from one source. Whether you require compact timing relays or reliable monitoring relays, particularly narrow coupling relays, plug-in relays, low-noise power relays or signal converters – it will not be easy to find a more complete and comprehensive range of relays anywhere. Quite simply, there is one for every possible need. What is more: all SIRIUS relays are particularly easy to use. So take a closer look at our range and convince yourself – you will be surprised.

#### SIRIUS 3UG, 3RR, 3RN, 3RS monitoring relays Reliable monitoring and protection

SIRIUS relays from Siemens offer maximum protection for machines and plants, and they communicate with the control level thanks to IO-Link. The SIRIUS relays for IO-Link reliably monitor network quality, power values, voltages, speeds and temperatures and at the same time they open up an even wider field of applications for you.

**3UG monitoring relays** are used to monitor electric and non-electric variables which cannot (or should not) be directly recorded by an automation system.

- Monitoring of networks for overvoltage or undervoltage, direction of rotation, or asymmetry
- Monitoring of loads using Cos-phi or current measurement
- Monitoring for insulation faults and fault currents
- Monitoring of levels or speeds of rotation

**The 3RR current monitoring relays** are suitable not only for monitoring motors or other loads, but are also well suited to monitoring multiphase currents of the entire plant or the driven process. In this way, for example, an idling pump or an overload is promptly detected and reported in good time. The 3RR2 monitoring relays can be set up individually or integrated directly into the load feeder.

**3RN thermistor motor protection devices** monitor the winding temperature of motors fitted with a PTC sensor.

- Compliance with the ATEX directive 2014/34/EC through conformity with EN 50495 and EN 60947-8 standards.
- Compliance with the safety requirements for PL c according to ISO 13849 or SIL 1 according to IEC 61508
- Fast fault diagnostics through display of open-circuit and short-circuit.
- Solid-state compatible output due to hard gold-plated contacts.

#### Note:

The 3RN1 relays have been replaced by the 3RN2 thermistor motor protection devices.

The **3RS2 temperature monitoring relays** can be used to measure temperatures in solid, liquid and gas media. The temperature is acquired by means of sensors in the medium, evaluated by the device and monitored for overshoot, under-shoot or location within a specified range (window function).

The family comprises an analog multi-function device which can be set using DIP switches and potentiometers, and digital devices which can be parameterized via an intuitive LCD display. The digital device is also available as a version with IO-Link.

All 3RS26 digital devices, including the 3RS28 versions with IO-Link, have safety certification according to IEC 61508/62061 or ISO 13849 up to SIL 1/PL c as well as EN 14597 for heat generating systems and EN 50156 for burners.

Furthermore, the functionality of the 3RS26/3RS28 digital devices can be expanded using a 3RS29 sensor expansion module with two additional resistance sensors, e.g. for monitoring three-phase motors or transformers.

The 3RS29 sensor expansion module also features an additional relay for outputting the sensor status, and an additional analog input 4 to 20 mA. This analog input allows ATEX applications to be implemented when using an intrinsically safe temperature sensor or other appropriate type of protection. The 3RS29 is connected wirelessly via a SIL 1-certified infrared communication interface.

#### Notes:

The SIRIUS 3RS2 temperature monitoring relays fully replace the 3RS1 predecessor.

#### SIRIUS speaks IO-Link

With the SIRIUS monitoring relay for IO-Link you are opting for maximum flexibility: As well as the autonomous monitoring function that is still available, measured values and data can also be transferred directly to the controller via IO-Link. Parameters can also be assigned locally or via IO-Link. This means that the SIRIUS relays for IO-Link are fully integrated into Totally Integrated Automation, our open system architecture for integrated automation. You also profit from significantly simplified device replacement – thanks to data matching and automatic re-parameterization via a parameter server.

## Supplementary components

### Timing, coupling and monitoring relays

#### SIRIUS relays

##### Overview

##### **SIRIUS 3RP, 7PV timing relays**

Electronic timing relays are used for all delayed switching operations in open-loop control, starting, protection and closed-loop control circuits.

Thanks to their sophisticated and compact design, the 3RP timing relays are ideal timer modules for control cabinet, switchgear and controller manufacturers from the industry. Due to their narrower design, the 7PV timing relays are particularly suitable for use in heating, ventilation and air-conditioning systems and compressors.

##### **SIRIUS 3RA28 function modules and solid-state time-delayed auxiliary switch blocks**

The 3RA281. function modules permit the construction of starters and contactor combinations for direct and star-delta starting. They include the essential control functions that are needed for the respective feeder – for example, timing and electrical interlocking functions. Function modules that function as timing relays can easily and quickly be fitted to SIRIUS contactors – without any significant wiring effort. They permit both ON-delay and OFF-delay switching of contactors.

The 3RA283. solid-state time-delayed auxiliary switch blocks can be connected to contactors and are designed for contactor coil voltages in the 24 to 240 V AC/DC wide voltage range. Auxiliary switches for control and alarm signals are used specially for switching the smallest signals for electronics applications. They are used, for example, for allowing a pump or fan to run on, in a similar way to an OFF-delay time relay or for the delayed activation of a gate drive. Simply by snapping and locking it into place, both the electrical and mechanical connection is made. To attenuate switching overvoltages of the contactor coil, a varistor is integrated in the time-delayed auxiliary switch.

##### **SIRIUS 3RQt to 3RQ3, 3TG10 and LZS coupling relays**

The SIRIUS coupling relays are ideally suitable for coupling to and from controllers and are thus the perfect partner for SIMATIC controllers. They can be used for electrical isolation, for voltage conversion, for signal amplification and for overvoltage and EMC protection.

The force-guided **3RQ1 coupling relays** (up to SIL 3 / PL e) are available in widths of 17.5 mm and 22.5 mm. Due to the forced guidance according to IEC 60947-5-1 (IEC 61810-3), the contacts of the installed relays are mechanically connected to each other in such a way that NO and NC contacts are never closed simultaneously. As a result, an opening failure can be reliably detected and maximum safety can be ensured. 3RQ1 coupling relays serve to reliably couple safe controllers, also for safety applications up to SIL 3 / PL e.

The **3RQ2 coupling relays** for universal use replace the 3RS18 coupling relays and set standards: as they have the same terminal assignment as the previous model the existing products can simply be changed over. The reduced variety of components simplifies product selection and standardization. With a wide voltage range from 24 V to 240 V AC/DC they are the star attraction on the coupler market. In this series, we offer you devices in the field-proven 22.5 mm industrial enclosure with one, two or three changeover contacts and with screw-type or spring-loaded connections (push-in technology). The versions with hard gold-plated contacts ensure an especially high contact reliability even at low currents. Thanks to the well-proven industrial enclosure, you can enjoy the benefits of user-friendly connection systems with permanent wiring, just the same as with our timing relays.

As the successors to the familiar 3TX7 coupling relays, the **3RQ3 coupling relays** are now available in a new uniform enclosure design. With their narrow width of 6.2 mm and low installation depth/height, they are ideal for space-optimized use in control cabinets with short gaps between tiers, and in flat control boxes. All versions are available with screw-type or spring-loaded terminals (push-in technology). Wiring time is reduced because conductors are inserted and clamped from the front.

3RQ3 coupling relays are available as:

- Coupling relay with relay output (not plug-in)
- Coupling relay with plug-in relay
- Coupling relay with semiconductor output (not plug-in)

**3TG10 power relays/miniature contactors** prove their worth wherever small, low-noise relays or contactors are required at a reasonable price. This makes them ideal for simple controllers, especially for use in large-series manufactured devices and controllers. For applications that do not require an overload relay and need only one auxiliary switch – and which therefore need more switching power, higher switching voltage, and a longer service life.

**LZS coupling relays with plug-in relays** are available as complete devices or as individual modules for self-assembly or spare parts requirements. This series is divided into three designs: RT, PT, and MT.

- Can be used for contact multiplication, adaptation of potential, or for switching small loads.
- Max. 4 changeover contacts in one device:
  - Wide-voltage versions with or without hard gold-plated contacts.
  - With screw-type or push-in spring-loaded terminals.

##### **SIRIUS 3RS70 signal converters**

The 3RS70 (previously 3RS17) signal converters (also innovated) share the enclosure concept with the 3RQ3 coupling relays. They are used mainly for the electrical isolation and conversion of analog signals. Sensors/actuators and controllers usually have different potentials and therefore require electrical isolation in the signal circuit. This is done either in the controller or by means of signal converters.

The conversion of one signal into another is required if, for example, a voltage signal has to be converted into a current signal for transmission over a longer distance, or if the output of a sensor and the input of a controller do not match.

The implemented frequency outputs offer another application. The input signal is converted to a proportional frequency here. This means that analog signals can be processed with digital inputs.

This is important if a controller offers no possibility for an analog input, or if all analog inputs are already occupied, for example, in the case of retrofits.

##### More information

- [Catalog IC 10](#)
- [Brochure "SIRIUS relays"](#)
- Internet: [www.siemens.com/sirius-monitor](http://www.siemens.com/sirius-monitor)

## Supplementary components

### Measuring systems, Automation systems

#### Motion Control Encoder measuring systems

##### Overview



- Measuring systems are encoders for recording distances, angles of rotation, and speeds.
- Can be used on machines in various industries, such as production machines, handling equipment, machine tools, and special-purpose machines.
- Can be connected to SIMATIC, SINAMICS, SINUMERIK and SIMOTION
- Couplings, mounting material, connectors, and completely pre-assembled signal cables are available as accessories.
- Built-on encoders are available as incremental or absolute encoders.
- Incremental encoders:
  - Interfaces RS422 (TTL), 1 V<sub>pp</sub> and HTL
  - Operating voltage 5 V DC or 10 V to 30 V DC

- Absolute encoders:
  - All absolute encoders are available in single-turn and multiturn versions.
  - Synchronous serial interface (SSI) or connection for EnDat, PROFIBUS DP, PROFINET IO with RT/IRT and DRIVE-CLiQ.
  - Encoders with PROFIBUS DP support Class 1 ... 3 profiles as well as isochronous mode, slave-to-slave communication, and application-specific supplementary functions. They are parameterizable.
  - Encoders with PROFINET IO support Class 1 ... 4 profiles.

All measuring systems are available in synchro flange or clamp flange versions. The absolute encoders are available in a hollow shaft design.

##### More information

- Internet:
  - <https://www.siemens.com/sensor-systems>
  - <https://www.siemens.com/industrymall>

#### SIMOTION Motion Control System

##### Overview



##### **SIMOTION system**

The well-proven, modular and scalable SIMOTION Motion Control System with high-end functions for motion control is the ideal solution for applications in mechanical engineering, in which modularity, maximum precision and speed are vital.

SIMOTION ensures a high level of flexibility at low engineering outlay with the modular technology object approach. Object-oriented programming and a programming model with units and libraries enable the creation of reusable software modules and the effective implementation of large quantity structures.

SIMOTION simplifies the development and integration of standard modules in an executable project with libraries for industry-specific applications and the SIMOTION easyProject project generator.

## Supplementary components

### Automation systems

#### SIMOTION Motion Control System

##### Overview

The SIMOTION system is made up of three components:

##### Engineering system

The SCOUT engineering system enables Motion Control, PLC and technology functions to be incorporated in one comprehensive, integrated system and provides all the necessary tools:

From programming and parameterization through testing and commissioning, to diagnostics.

SCOUT can be used in SIMATIC STEP 7, either with standardized data management and configuring procedures, or as a stand-alone engineering tool (SCOUT Stand-Alone). SCOUT TIA (SIMOTION in the TIA Portal) is available as an optional package for TIA Portal V13 and above and is included in the scope of supply of SCOUT.

The following options, for example, are available in the engineering system for programming:

- Graphic programming with Motion Control Chart (MCC)
- Ladder Diagram (LAD)/Function Block Diagram (FBD)
- High-level language Structured Text (ST), including object-oriented programming

##### Runtime system

The runtime system offers a high-performance execution system for cyclic and sequential tasks. The runtime software modules make the different PLC, Motion Control and technology functions available. By selecting the appropriate modules, the overall functionality of the system can be flexibly adapted to the machine.

##### Hardware platforms

The hardware platforms are the basis of the SIMOTION Motion Control System. The application created with the engineering system and the associated runtime software modules can be implemented on different hardware platforms. The scalable SIMOTION hardware supports centralized, distributed and mixed topologies for all machine designs with up to 128 axes per controller.

##### **SIMOTION D – Compact and integrated in the drive**

- The complete machine automation with drive control, PLC, Motion Control and technology functionality in one compact unit of SINAMICS S120 design.
- Particularly fast response
- Versatile networking options via PROFINET, PROFIBUS or Ethernet
- Scalable since multiple performance versions available
- SIMOTION D is available in two configurations:
  - As a single-axis system SIMOTION D410-2 with multi-axis option (blocksize configuration). The Control Units are available in D410-2 DP and D410-2 DP/PN versions and are snapped onto the SINAMICS S120 PM240-2 Power Modules in blocksize format.
  - As a multi-axis system SIMOTION D4x5-2 in four performance variants for as many as 128 axes (booksize format)
- Ideal for:
  - Compact machines
  - Distributed automation concepts, e.g. on machines with a large number of axes
  - Modular machines
  - Time-critical demands on the axis couplings

##### **SIMOTION P – Open for other tasks**

- This PC-based, open Motion Control System is available in two versions:
  - SIMOTION P320-4E for embedded PC solutions running on the Windows Embedded Standard 7 operating system
  - SIMOTION P320-4S for high-performance applications running on the Windows 7 Ultimate operating system
- Control, Motion Control, and HMI functions are executed together with standard PC applications on one platform. The advantage for the user:
  - Using the PC platform and the Microsoft Windows operating system, with a real-time expansion for SIMOTION – the advantages of both worlds are combined in SIMOTION P:
    - Openness thanks to the Windows operating system
    - Real-time capability thanks to the SIMOTION operating system
- Ideal for:
  - Applications requiring an open PC world
  - Applications with particularly high performance requirements, e.g. hydraulics applications
  - Applications requiring control and visualization on one hardware system
  - Extensive data storage, evaluation and logging

##### **SIMOTION C – Modularity and flexibility**

- Controllers in SIMATIC S7-300-design
- 2 versions, optionally with PROFINET interface or with integrated drive interfaces for analog and stepper drives
- Onboard inputs/outputs expandable using I/O modules from the SIMATIC S7-300 range of products
- With integrated isochronous PROFIBUS interfaces
- Ideal for:
  - Highest possible level of freedom for drive selection
  - Broad range of process signals
  - Retrofit applications by means of integrated analog interfaces

##### More information

- Internet:
  - <http://www.siemens.com/simotion>
  - <http://www.siemens.com/industrymall>

## Overview



### SINUMERIK 828D – the powerhouse among the compact CNCs

With their unique CNC performance, SINUMERIK 828D CNCs set productivity benchmarks when it comes to milling and turning on standard machines as well as functions for easy automation of grinding machines.

### Rugged and maintenance-free

Their die-cast magnesium operator panel fronts, the panel-based CNC design with minimal interfaces, as well as a high degree of protection, make SINUMERIK 828D CNCs reliable partners even in harsh environments.

Designed without a fan or hard disk, with NVRAM memory technology and no back-up battery, SINUMERIK 828D CNCs are completely maintenance-free.

### User-friendly

The SINUMERIK 828D CNCs are very easy to operate thanks to a full QWERTY CNC keyboard with short-stroke keys and a high-resolution 10.4" TFT color display or 15.6" touch display.

CNC data are quickly and easily transferred via USB, CF card (for 10.4") and RJ45 interfaces on the operator panel front.

### Optimum scalability

Based on the three CNC performance versions SW24x, SW26x and SW28x of the SINUMERIK 828D CNCs, favorably-priced compact as well as more complex machines with additional axes/spindles and 2 machining channels can be implemented.

### Preconfigured technology for use in standard turning and milling machines

SINUMERIK 828D is perfectly adapted for use in standard machines and provides optimum support for turning and milling technologies. With two preconfigured system software variants for machining technology, the SINUMERIK 828D CNC systems are ready for use in turning and milling machines on dispatch from the factory.

### The ideal basis for implementing a compact grinding machine

The G-Tech technology variant provides grinding machine manufacturers with a perfect platform for designing grinding machines – both cylindrical and surface grinding machines are supported.

Since grinding machine manufacturers want to fully incorporate their specific process know-how so that it is even reflected in the operating philosophy of the CNC, the G-Tech variant of the SINUMERIK 828D offers a number of sophisticated grinding and dressing cycles. Additionally, SINUMERIK Run MyScreens provides manufacturers with the option of designing their own HMI.

### More information

- Internet:  
<https://www.siemens.com/industrymall>  
<https://www.siemens.com/sinumerik>  
<https://www.siemens.com/nc82>
- For full details of SINUMERIK 828, please refer to the market-specific solutions in the Industry Mall:  
<https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10078797>

## Supplementary components

Automation systems

SINUMERIK CNC automation systems

### SINUMERIK 840D sl

#### Overview



#### **SINUMERIK 840D sl – ultimate performance in the premium class**

The SINUMERIK 840D sl CNC offers modularity, openness, flexibility and uniform structures for operation, programming, and visualization. It provides a system platform with trend-setting functions for almost all technologies.

Integrated into the SINAMICS S120 drive system and complemented by the SIMATIC S7-300 automation system, the SINUMERIK 840D sl forms a complete digital system that is ideally suited for the mid- to upper-performance range.

The SINUMERIK 840D sl is characterized by:

- A high degree of flexibility
- Excellent dynamic response and precision
- Optimum integration into networks

#### **Benefits**

- Outstanding performance and flexibility for multi-axis systems of average to high complexity thanks to scalable hardware and software
- Universal openness of the user interface, the PLC and the NCK area to allow integration of your specialist know-how
- Integrated safety functions for man and machine: SINUMERIK Safety Integrated
- Comprehensive range of products for integrating machine tools into communication, engineering and production processes: SINUMERIK Integrate

#### **Application**

The SINUMERIK 840D sl can be deployed around the world for the following technologies:

- Turning
- Drilling
- Milling
- Grinding
- Laser machining
- Nibbling
- Punching
- Tool and mold making
- High-speed cutting applications
- Woodworking and glass processing
- Handling
- Transfer lines
- Rotary indexing machines
- Mass production
- JobShop production

The SINUMERIK 840DE sl is available as an export version for use in countries where approval is required.

#### More information

- Internet:
  - <https://www.siemens.com/industrymall>
  - <https://www.siemens.com/sinumerik>
  - <https://www.siemens.com/nc62>
- For full details of SINUMERIK 840D sl, please refer to the market-specific solutions in the Industry Mall:
  - <https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10121243>



## Overview



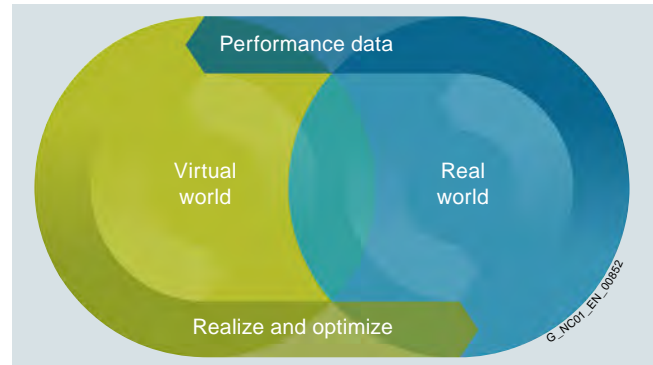
### **SINUMERIK ONE: the next level CNC in the premium class**

SINUMERIK ONE – the digital native CNC with the pioneering CNC system for highly productive machine tools. Thanks to its digital twin, the key element in digital transformation, SINUMERIK ONE helps to simulate and test work processes completely virtually - saving time, resources and costs.

### **Boosting productivity with SINUMERIK and digitalization solutions**

Shorter product introduction times and increasing individualization of products influence production with machine tools. High productivity is more important than ever for machine manufacturers and users. The key factor is optimum interaction of automation and CNC solutions and sophisticated technology – and the effective integration of digital solutions. This applies to all areas: from design and construction of a machine to operation and service. SINUMERIK connects automation, competence in technology, and digitalization to form a single solution offering for more productivity. SINUMERIK CNC systems are the optimum solution for the production of individual parts or series production, for simple or complex workpieces.

## Benefits



Merging the real world with the virtual world

The new SINUMERIK ONE is specifically designed for smart manufacturing.

- The digital twin is an integral part of the CNC system; virtual and real CNC merge and complement each other
- Significant reduction in product development and market launch times thanks to the **digital first** strategy
- Improved networking and data communication capabilities
- Significant reduction in the duration of real commissioning thanks to virtual commissioning preparation
- Significantly increased CNC performance
- Significantly shorter downtimes and complete integration into the TIA Portal thanks to the integrated SIMATIC S7-1500F PLC

This means that the SINUMERIK ONE can be seamlessly integrated into digital solutions and workflows.

### More information

- Internet:  
<https://www.siemens.com/industrymall>  
<https://www.siemens.com/sinumerik-one>  
<https://www.siemens.com/nc63>
- For full details of SINUMERIK ONE, please refer to the market-specific solutions in the Industry Mall:  
<https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10028455https://intranet.entry.siemens.com>

## Supplementary components

Automation systems

SINUMERIK CNC automation systems

### SINUMERIK MC

#### Overview



#### **SINUMERIK MC – the universal and open CNC which can be easily integrated into existing machine solutions**

Thanks to its integrated SINUMERIK CNC, SIMATIC controller and Windows 10 operating system, the SINUMERIK MC is the ideal solution for machine tools with customized user interfaces.

The areas of application range from machining wood, stone and glass and adhesive application to simple grinding applications and special machine tool technologies such as sheet metal cutting, laser and water jet cutting, as well as additive manufacturing.

- The integrated Windows operating system allows the user interface to be designed simply and matched to customer requirements. The **open operating concept** and extensive interfaces make the SINUMERIK MC an integrated and open control system.
- The proven SINUMERIK CNC technology enables maximum precision in motion control and – thanks to **G code programming** – freedom and flexibility in machine control.
- Shorter response times of the latest SIMATIC S7-1500F PLC enable **increased processing speed** and significantly boost automation performance.
- Symbolic programming, modern programming languages and extensive toolboxes for implementing standard applications make **engineering in the TIA Portal** simple and efficient.
- SINUMERIK MC offers **Safety Integrated** as a uniform Siemens industry safety standard and implements the multi-level defense-in-depth concept for IT security.
- **Attractive option packages** offer the best possible adaptation to individual machine requirements.

#### More information

- Internet:  
<https://www.siemens.com/industrymall>  
<https://www.siemens.com/sinumerik>  
<https://www.siemens.com/nc64>
- For full details of SINUMERIK MC, please refer to the market-specific solutions in the Industry Mall:  
<https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10367270>

#### Overview

MOTION-CONNECT includes connection systems and components which are optimally tailored to individual areas of application. MOTION-CONNECT cables feature state-of-the-art connection systems to ensure fast, reliable connection of different components, and offer maximum quality as well as system-tested reliability.



MOTION-CONNECT power cable and signal cable

MOTION-CONNECT cables are available as fully-assembled power and signal cables or sold by the meter. The pre-assembled cables can be ordered in length units of 10 cm (3.94 in) and can be extended, if necessary.

Whatever your machine requirements, MOTION-CONNECT offers the solution.

- **Robust, high-performance and easy to use** thanks to pre-assembled cables with a rugged metal connector in degree of protection IP67 and reliable SPEED-CONNECT quick-release lock
- **Outstanding and proven quality** achieved by consistent quality management and system-tested cables

Cables are available in two different qualities – MOTION-CONNECT 500 and MOTION-CONNECT 800PLUS.

MOTION-CONNECT 500	MOTION-CONNECT 800PLUS
<ul style="list-style-type: none"> <li>• Cost-effective solution for predominantly fixed installation</li> <li>• Tested for travel distances up to 5 m (16.4 ft)</li> </ul>	<ul style="list-style-type: none"> <li>• Meets requirements for use in cable carriers</li> <li>• Oil-resistant</li> <li>• Tested for travel distances of up to 50 m (164 ft)</li> </ul>

#### More information

- Internet:
  - <http://www.siemens.com/motion-connect>
  - <http://www.siemens.com/industrymall>

## Supplementary components

### Notes

## Appendix



<b>17/2</b>	<b>SITRAIN – Digital Industry Academy</b>
<b>17/3</b>	<b>Additional documentation</b>
17/3	SIMATIC Manual Collection
<b>17/4</b>	<b>Standards and approvals</b>
17/4	CE marking
17/5	Certificates
<b>17/5</b>	<b>Quality management</b>
<b>17/6</b>	<b>Siemens Automation Cooperates with Education (SCE)</b>
17/6	Teaching made easy - Comprehensive support on the way to Industry 4.0
<b>17/9</b>	<b>Partners</b>
17/9	Siemens Partner Program
17/10	Partners at Siemens
<b>17/11</b>	<b>Industry Services</b>
17/13	Online Support
<b>17/14</b>	<b>Software licenses</b>
<b>17/16</b>	<b>Conditions of sale and delivery</b>

## Appendix

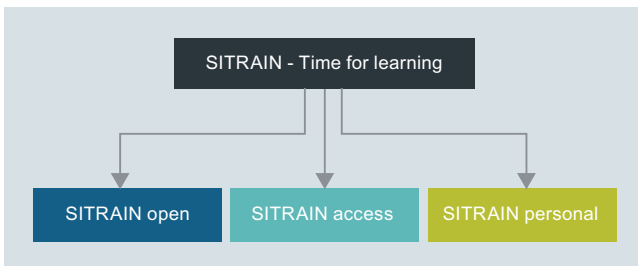
### SITRAIN – Digital Industry Academy

#### Introduction



#### **Time for learning**

Today's demands on our knowledge are every bit as diverse and dynamic as our profession itself. We keep learning more and longer – for our work, for our career and for ourselves. Advancing digitalization entails new topics and is also changing the way we absorb and process knowledge. SITRAIN – Digital Industry Academy offers the right source of knowledge here, which we can use anytime in just the way we need it. The time for learning is now.



#### Knowledge for every need

With its three areas – SITRAIN open, SITRAIN access and SITRAIN personal – SITRAIN offers you an all-encompassing range of options for an ongoing expansion of your knowledge and skills, suited for every type of learner. And SITRAIN uses advancing digitalization to continuously expand content and offer new training methods.

#### Knowledge you can always find

SITRAIN open bundles useful information, worthwhile data and up-to-date expert knowledge about Siemens products for industry. Search it anytime, find anything – and always the right stuff.

#### Knowledge that gets you ahead

SITRAIN access is learning in the digital age. It offers you individualized ways to build your knowledge and access to exclusive digital training courses. Take advantage of sustainable learning success with a wide range of learning methods. Improve your skills – whether working in groups with others, or by yourself. Whenever, wherever and however you need to.

#### Knowledge you can experience

We all want to learn from the best. And SITRAIN personal's training courses let you benefit from our well-practiced trainers' expert knowledge, along with direct access to our training equipment. That's the best way to convey knowledge – whether at your company, in our training classrooms or as online training.

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#### **SITRAIN – Digital Industry Academy Customer Support Germany**

Tel.: +49 911 895-7575

E-Mail: [sitrain.digital.industry.academy.de@siemens.com](mailto:sitrain.digital.industry.academy.de@siemens.com)

#### **SITRAIN – Digital Industry Academy**

[siemens.com/sitrain](https://siemens.com/sitrain)

- SITRAIN open:  
[siemens.com/sitrain-open](https://siemens.com/sitrain-open)
- SITRAIN access:  
[siemens.com/sitrain-access](https://siemens.com/sitrain-access)
- SITRAIN personal:  
[siemens.com/sitrain-personal](https://siemens.com/sitrain-personal)

## Overview

The SIMATIC manual collection brings together the manuals of Totally Integrated Automation in the smallest possible package. It is eminently suitable for startup and service, replaces the space-consuming paper version in the office and provides fast access to the information.

The manual collection contains manuals in 5 languages for

- LOGO!
- SIMADYN
- SIMATIC bus components
- SIMATIC C7
- SIMATIC Distributed I/O
- SIMATIC HMI
- SIMATIC Sensors
- SIMATIC NET
- SIMATIC PC-based Automation
- SIMATIC PCS 7
- SIMATIC PG/PC
- SIMATIC S7
- SIMATIC Software
- SIMATIC TDC

Manuals that are not yet available in all 5 languages will at least be included in English and German.

There is an update contract for the SIMATIC Manual Collection that encompasses supply of the up-to-date collection and three subsequent updates which is valid for one year. If the update contract is not cancelled, it is automatically extended and the list price will be charged to the customer.

## Ordering data

### SIMATIC Manual Collection

Electronic manuals on DVD, multilingual:  
 LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

## Article No.

**6ES7998-8XC01-8YE0**

**6ES7998-8XC01-8YE2**

## Appendix

### Standards and approbations

#### CE marking

##### Overview

The electronic products described in this catalog comply with the requirements and protection objectives of the following EU directives insofar as they relate to the product concerned. They also comply with the corresponding harmonized European standards (EN) published for these products in the Official Journals of the European Community.

- 2014/30/EU "Electromagnetic Compatibility" (EMC Directive)
- 2014/35/EU "Electrical equipment designed for use within certain voltage limits" (Low Voltage Directive)
- 2014/34/EU "Equipment and protective systems intended for use in potentially explosive atmospheres" (Explosion Protection Directive)
- For F-modules, the following also applies: 2006/42/EC "Machinery Directive"

The originals of the declarations of conformity are kept available by us for the responsible supervisory authorities.

##### **Note on the EMC Directive:**

In terms of their interference emissions, SIMATIC products are designed for industrial applications.

If individual products deviate from this specification, it is noted in the catalog with the products.

The installation instructions in the manuals must be adhered to when installing and operating the products described in this catalog. These contain, for example, important information on installation in cabinets and on the use of shielded cables.

##### Notes for machine manufacturers

The SIMATIC automation system is not a machine within the context of the EU machine guidelines. Therefore a declaration of conformity with regard to the EU machine directive 89/392/EEC or 2006/42/EU (new edition, applicable from end of 2009) may not be provided for SIMATIC.

The EU machine directive regulates the requirements placed on a machine or a part thereof. A machine is understood for the purposes of this guideline to be a combination of interconnected parts or mechanisms (see also EN 292-1, Paragraph 3.1).

SIMATIC is part of the electrical equipment of a machine, and must therefore be integrated into the evaluation of the complete machine by the machine manufacturer.

As electrical equipment, SIMATIC is subject to the low-voltage directive which, as a "total safety directive", covers all dangers just like the machine directive.

The EN 60204-1 standard (safety of machines, general requirements for the electrical equipment of machines) is applicable to the electrical equipment of machines.

The following table will help you in the provision of your declaration of conformity, and shows which criteria according to EN 60204-1 (2006-06) apply to SIMATIC. You can obtain further information from the enclosed declaration of conformity according to the low-voltage and EMC directives (with list of included standards).

EN 60204-1	Topic/criterion	Notes
Paragraph 4	General requirements	The requirements are met when the equipment is assembled/installed in accordance with the installation guidelines. Please note the relevant information in the manuals.
Paragraph 11.2	Digital input/output interfaces	The requirements are met
Paragraph 12.3	Programmable equipment	The requirements are met when the equipment is installed in lockable cabinets to protect against alteration of the memory contents by unauthorized persons
Paragraph 20.4	Voltage tests	The requirements are met



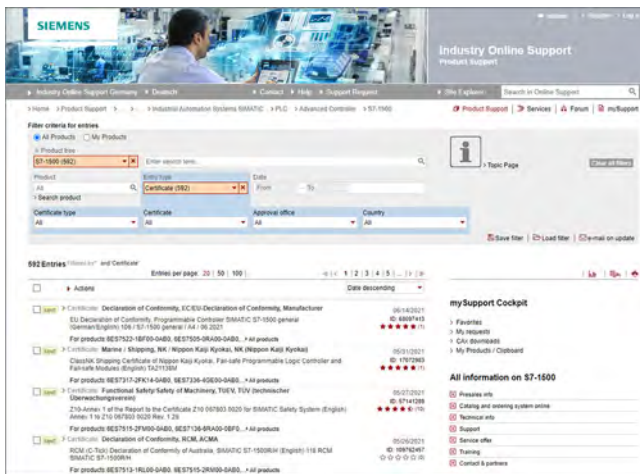
### Certificates, authorizations, approbations, declarations of conformity

An overview of the certificates available for SIMATIC products (CE, UL, CSA, FM, shipping authorizations) can be found in the internet at

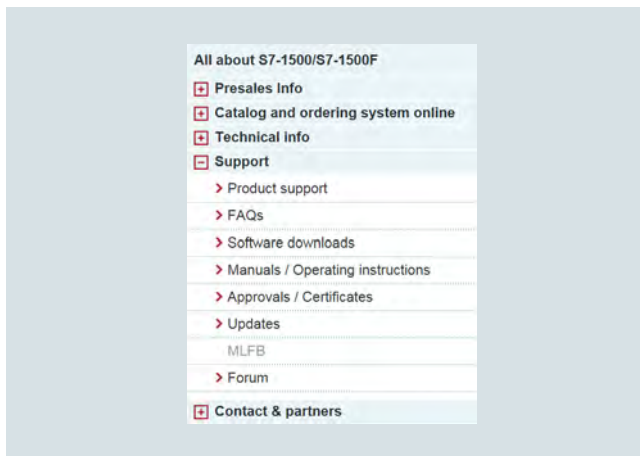
<http://www.siemens.com/simatic/certificates>

The lists are continuously updated. The data for products which have not yet been included in the overview is continuously collected and prepared for the subsequent edition.

You can also find certificates, approbations, verification certificates or characteristic curves under Product support "Entry list"



or by going directly to the Link Box:



### Quality management

The quality management system of the Siemens Operating Company Digital Industries, Business Unit Factory Automation, complies with the international standard ISO 9001.

The products and systems described in this catalog are sold under application of a quality management system certified by DQS in accordance with DIN EN ISO 9001.

The DQS certificate is recognized in all IQ Net countries.

#### **DQS Registered Certificate No.:**

Siemens AG

- DF FA  
Reg. No.: 001323 QM15

## Appendix

### Siemens Automation Cooperates with Education (SCE)

#### Teaching made easy - Comprehensive support on the way to Industry 4.0

#### Knowledge & technology – the keystones to success in digitalization



**Digitalization is quickly and radically changing our world. What does this mean for education?**

In the world of Industry 4.0, companies can expect a host of new opportunities and challenges. New systems are verified on the spot through simulations. Automated mass production processes can make every product on the conveyor belt a unique product.

New products are now market-ready much faster. Siemens is shaping this transformation as a technology leader in the field of automation and process lifecycle management (PLM).

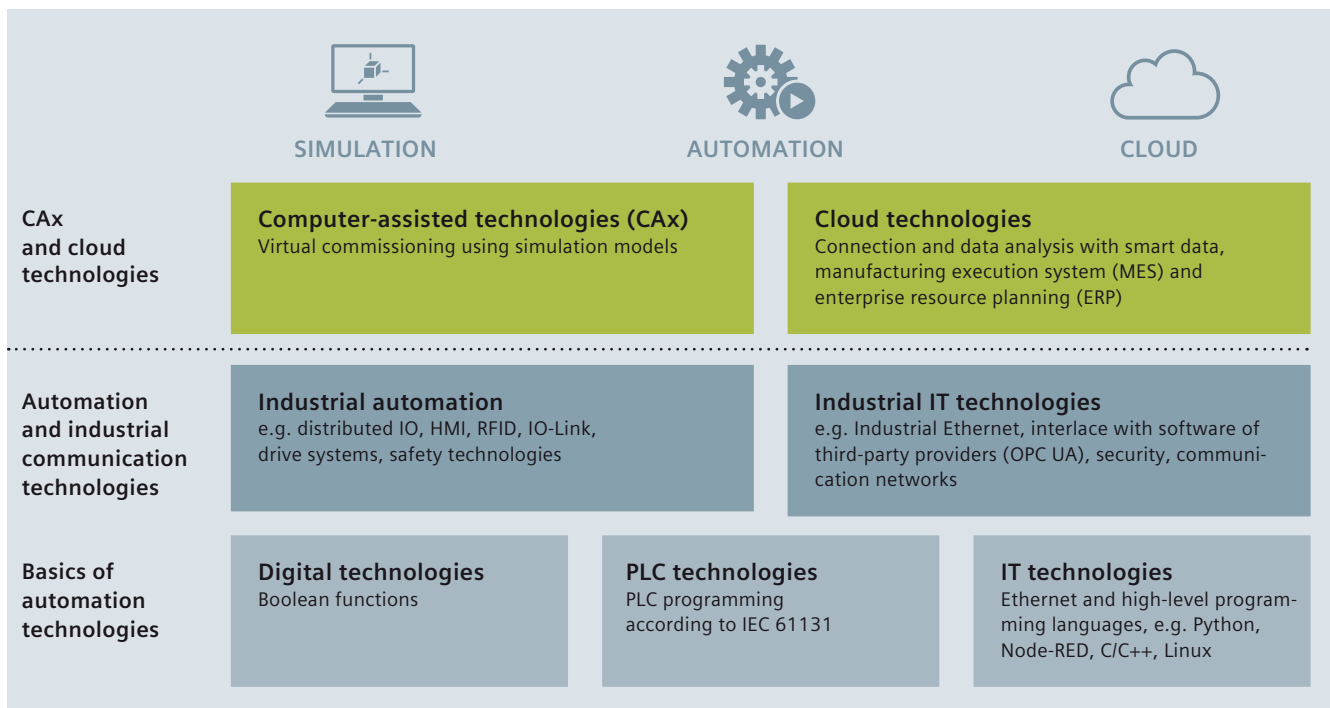
These new digitalization processes are changing the know-how requirements for employees. Many educational institutions are facing the challenge of conveying Industry 4.0 know-how as part of their teaching and training. The Siemens Automation Cooperates with Education (SCE) program is supporting educators on the way to Industry 4.0.

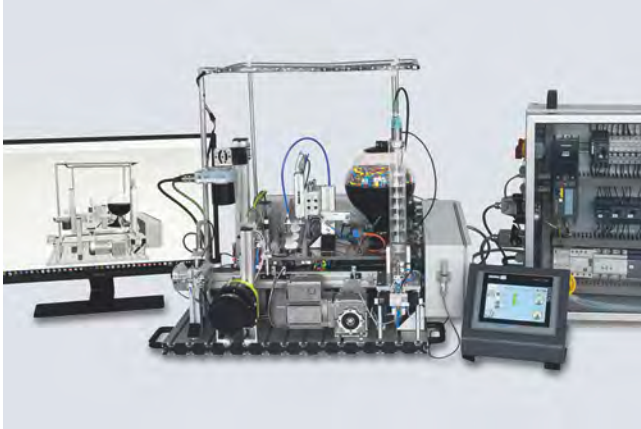
#### The SCE digitalization concept for educators

**The SCE digitalization concept presented here shows how digitalization can be implemented in educational institutions – from vocational schools to universities.**

Digitalization (or Industry 4.0) know-how is now introduced through CAx and cloud technologies. It is founded on the basics of automation, such as digital technologies, PLC and information technologies, and on advanced automation and industrial communication technologies.

The level of digitalization knowledge can be weighted, depending on the vocational field or branch of study – e.g. mechanical engineering, automation engineering or computer science.



**The SCE digitalization concept for educators** (continued)

As part of their project work, students at Vocational School 2 in Wolfsburg, Germany, have implemented the three levels of the SCE Industry 4.0 concept. A virtual twin created with the Siemens NX Mechatronics Designer (MCD) CAD software was used for the design and virtual commissioning. This enables fast and efficient assembly of the real automation system, e.g. with SIMATIC S7-1500/ET 200SP/RFID, for use in classes. Production data, such as the number of bottles filled, production date and system parameters, are uploaded to a cloud using SIMATIC IOT2000.

[siemens.com/sce/iot2000](https://siemens.com/sce/iot2000)

[siemens.com/nx](https://siemens.com/nx)

**The SCE offers****Learning and training documents**

More than 100 didactically prepared learning and training documents are available through SCE and incorporate the digitalization concept. They are designed for use in classes, but can also be customized or used for individual study. These documents are available for free download, most of them in 7 languages.

[siemens.com/sce/documents](https://siemens.com/sce/documents)

**Educator courses**

Excellent teaching content is needed to introduce students to digitalization. For this purpose, SCE holds educator courses in certain regions. Based on our learning and training documents and through practical exercises, educators acquire the latest Industry 4.0 know-how.

[siemens.com/sce/courses](https://siemens.com/sce/courses)

**Trainer packages**

The 90 SCE trainer packages help educators teaching and implementing the SCE digitalization concept. Trainer packages comprise specially compiled, genuine Siemens hardware and software products. The trainer packages are based on the learning and training documents and are offered to schools, colleges and universities at special terms.

[siemens.com/sce/tp](https://siemens.com/sce/tp)

**Support for your projects / textbooks**

We support you on selected projects with advice and assistance from SCE contact partners.

As a special service, we support textbook authors. We maintain a list of textbooks on the SCE website.

[siemens.com/sce/contact](https://siemens.com/sce/contact)

[siemens.com/sce/books](https://siemens.com/sce/books)

## Appendix

### Siemens Automation Cooperates with Education (SCE)

#### Teaching made easy - Comprehensive support on the way to Industry 4.0

##### Partnerships for proliferation of Industry 4.0 in education



##### **Partnership with WorldSkills**

As a technology powerhouse, we support vocational training of students around the world. Since 2010, we have partnered with WorldSkills as a Global Industry Partner in order to amplify this cause.

WorldSkills is an international organization whose mission is to raise the profile and recognition of skilled people, and show how important vocational skills are in achieving economic growth and personal success. Every two years, WorldSkills hosts the world championships of skills.

Siemens provides the competitors with automation products, such as SIMATIC S7-1500 and LOGO!, for the disciplines: industrial control, electrical installations, Polymechanics/Automation and manufacturing technology.

Additionally, we support selected continental and regional competitions.

[siemens.com/worldskills](https://www.siemens.com/worldskills)

##### **Partnerships with educators**

We provide support to educators and educational organizations in the form of one-on-one advice through SCE contact partners and Siemens experts as well as long-term cooperation.

[siemens.com/sce/contact](https://www.siemens.com/sce/contact)

##### **Partnerships with producers of learning systems**

For practical training in classrooms and labs, numerous producers of learning systems offer a wide range of complete didactic solutions based on SCE trainer packages.

[siemens.com/sce/learningsystems](https://www.siemens.com/sce/learningsystems)



##### Information portal



To facilitate your teaching assignment and/or for selfstudy, we offer educators and students a comprehensive SCE information portal. At this portal you have quick access to all SCE offers, e.g. learning and training documents including projects, Getting Started information, videos, manuals, trial software and newsletters.

[siemens.com/sce](https://www.siemens.com/sce)



**Overview****Siemens Solution and Approved Partner –  
Partners for your success****Highest competence in automation and drive technology**

Siemens works closely together with selected partner companies around the world in order to ensure that customer requirements for all aspects of automation and drives are fulfilled as best as possible – wherever you are, and whatever the time.

We place great value on our customers acting in accordance with the same ideals which characterize Siemens as a whole: Competence, professionalism and quality. That is why continuous development through qualification and certification measures in line with global standards is a central aspect of our Partner Program. This means that with our partners, you benefit from the same high quality standards all over the world. The partner emblem is the symbol for tried and tested quality.

**The partner network for industry**

The Siemens Partner Program offers you expertise and experience close at hand.

Within our global network, we distinguish between Solution Partners and Approved Partners. We currently work with more than 1,500 Solution Partners around the world. Our network of over 150 Approved Partners continues to grow. In more than 80 countries worldwide

**Siemens Solution Partner – Automation Drives**

At present we are working with more than 1,500 **Solution Partners** worldwide. They are characterized by extensive application, system and sector knowledge, as well as proven project experience, and are able to implement future-proof tailored solutions of the highest quality, based on our product and system portfolio.

**Siemens Approved Partner – Value Added Reseller**

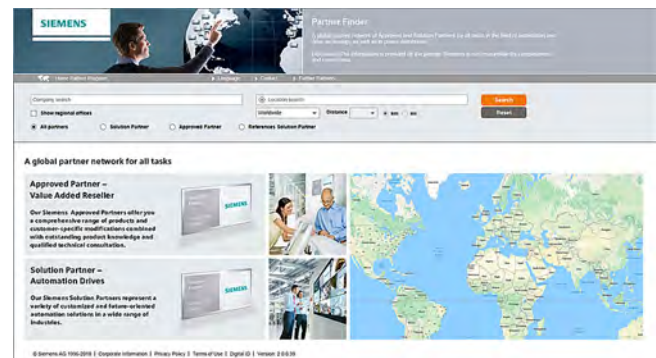
With their detailed technical knowledge, **Siemens Approved Partners – Value Added Resellers** offer a combination of products and services that range from specialist technologies and customized modifications to the provision of high-quality system and product packages. They also provide qualified technical support and assistance.

**Siemens Approved Partner – Industry Services**

**Siemens Approved Partner – Industry Services** put their unique expertise entirely at the service of enhancing your productivity and can be instrumental in ensuring the availability of your plants.

**Partner Finder**

The ideal partner for your task is just a mouse click away!



In the Siemens global Solution Partner program, customers are certain to find the optimum partner for their specific requirements – with no great effort. The Partner Finder is basically a comprehensive database that showcases the profiles of all our partners.

**Easy selection:**

Set filters in the search screen form according to the criteria that are relevant to you. You can also directly enter the name of an existing partner.

**Skills at a glance:**

Gain a quick insight into the specific competencies of any particular partner with the reference reports.

**Direct contact option:**

Use our electronic query form:

[www.siemens.com/partnerfinder](http://www.siemens.com/partnerfinder)

Additional information of the Siemens Partners for industry is available online at:

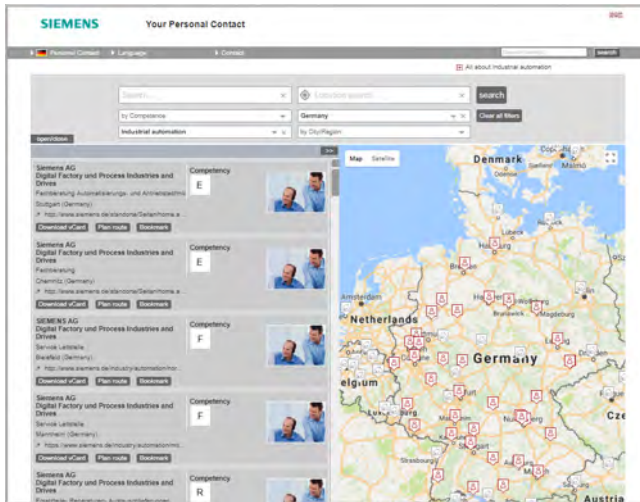
[www.siemens.com/partnerprogram](http://www.siemens.com/partnerprogram)

## Appendix

### Partners

#### Partners at Siemens

#### Overview



At your service locally, around the globe for consulting, sales, training, service, support, spare parts on the entire portfolio of Digital Industries.

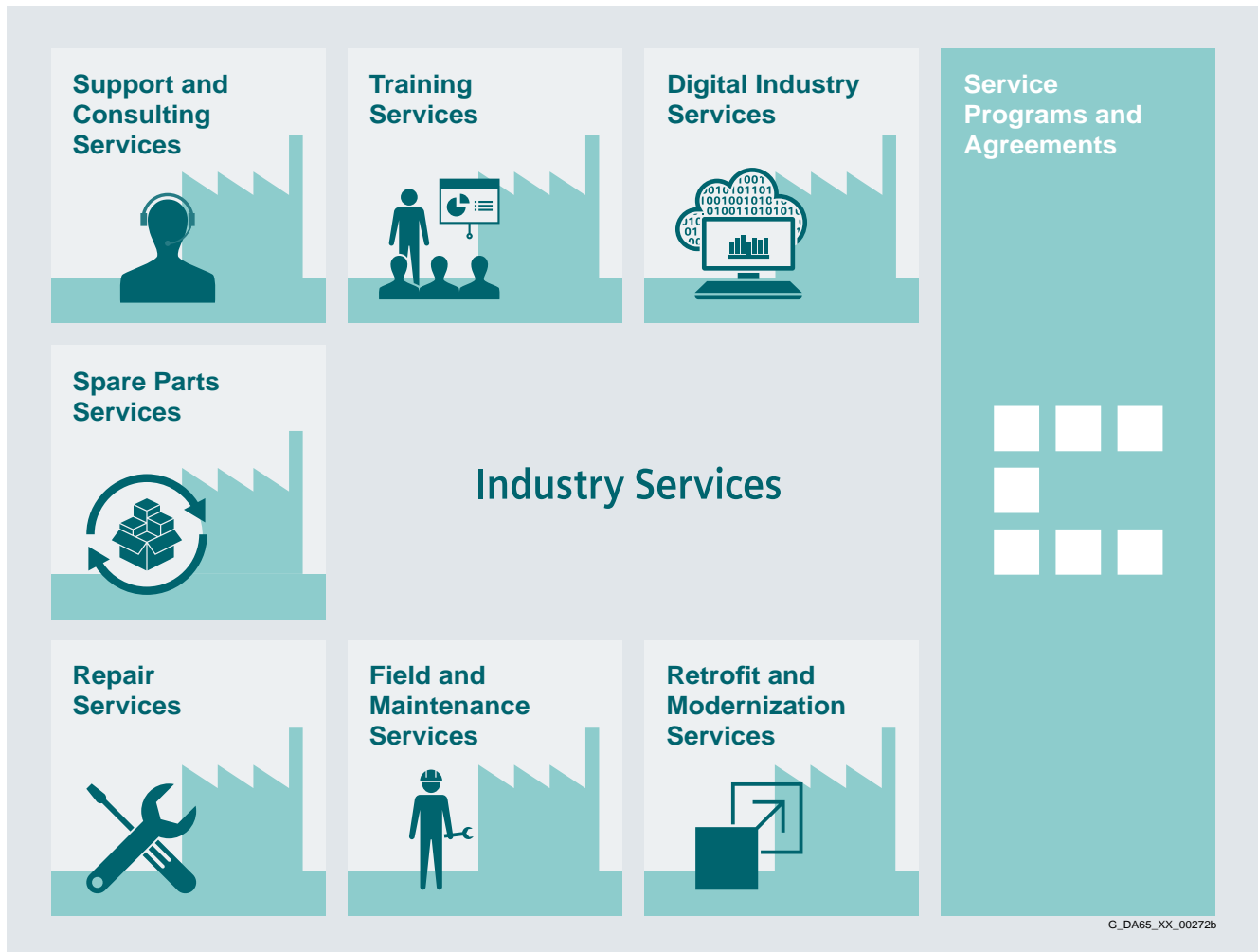
Your partner can be found in our Personal Contacts Database at: [www.siemens.com/automation-contact](http://www.siemens.com/automation-contact)

You start by selecting

- the required competence,
- products and branches,
- a country and a city

or by a

- location search or free text search.

**Overview**

**Keep your business running and shaping your digital future – with Industry Services**

Optimizing the productivity of your equipment and operations can be a challenge, especially with constantly changing market conditions. Working with our service experts makes it easier. We understand your industry's unique processes and provide the services needed so that you can better achieve your business goals.

You can count on us to maximize your uptime and minimize your downtime, increasing your operations' productivity and reliability. When your operations have to be changed quickly to meet a new demand or business opportunity, our services give you the flexibility to adapt. Of course, we take care that your production is protected against cyber threats. We assist in keeping your operations as energy and resource efficient as possible and reducing your total cost of ownership. As a trendsetter, we ensure that you can capitalize on the opportunities of digitalization and by applying data analytics to enhance decision making: You can be sure that your plant reaches its full potential and retains this over the longer lifespan.

You can rely on our highly dedicated team of engineers, technicians and specialists to deliver the services you need – safely, professionally and in compliance with all regulations. We are there for you, where you need us, when you need us.

[www.siemens.com/industryservices](http://www.siemens.com/industryservices)

## Appendix

### Industry Services

#### Overview



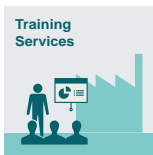
#### Digital Industry Services

Digital Industry Services make your industrial processes transparent to gain improvements in productivity, asset availability, and energy efficiency.

Production data is generated, filtered and translated with intelligent analytics to enhance decision-making.

This is done whilst taking data security into consideration and with continuous protection against cyber-attack threats.

[www.siemens.com/global/en/products/services/industry/digital-industry-services.html](http://www.siemens.com/global/en/products/services/industry/digital-industry-services.html)



#### Training Services

From the basics and advanced to specialist skills, SITRAIN courses provide expertise right from the manufacturer – and encompass the entire spectrum of Siemens products and systems for the industry.

Worldwide, SITRAIN courses are available wherever you need a training course in more than 170 locations in over 60 countries.

<https://support.industry.siemens.com/cs/ww/en/sc/2226>



#### Support and Consulting Services

**Industry Online Support** site for comprehensive information, application examples, FAQs and support requests.

**Technical and Engineering Support** for advice and answers for all inquiries about functionality, handling, and fault clearance. The Service Card as prepaid support for value added services such as Priority Call Back or Extended Support offers the clear advantage of quick and easy purchasing.

**Information & Consulting Services**, e.g. SIMATIC System Audit; clarity about the state and service capability of your automation system or Lifecycle Information Services; transparency on the lifecycle of the products in your plants.

<https://support.industry.siemens.com/cs/ww/en/sc/2235>



#### Spare Parts

Spare Parts Services are available worldwide for smooth and fast supply of spare parts – and thus optimal plant availability. Genuine spare parts are available for up to ten years. Logistic experts take care of procurement, transport, custom clearance, storage and order management.

Reliable logistics processes ensure that components reach their destination as needed.

Since not all spare parts can be kept in stock at all times, Siemens offers a preventive measure for spare parts provisioning on the customer's premises with optimized **Spare Parts Packages** for individual products, custom-assembled drive components and entire integrated drive trains – including risk consulting.

**Asset Optimization Services** help you design a strategy for parts supply where your investment and carrying costs are reduced and the risk of obsolescence is avoided.

<https://support.industry.siemens.com/cs/ww/en/sc/2110>



#### Repair Services

Repair Services are offered on-site and in regional repair centers for fast restoration of faulty devices' functionality.

Also available are extended repair services, which include additional diagnostic and repair measures, as well as emergency services.

<https://support.industry.siemens.com/cs/ww/en/sc/2154>



#### Field and Maintenance Services

Siemens specialists are available globally to provide expert field and maintenance services, including commissioning, functional testing, preventive maintenance and fault clearance.

All services can be included in customized service agreements with defined reaction times or fixed maintenance intervals.

<https://support.industry.siemens.com/cs/ww/en/sc/2265>



#### Retrofit and Modernization Services

Provide a cost-effective solution for the expansion of entire plants, optimization of systems or upgrading existing products to the latest technology and software, e.g. migration services for automation systems.

Service experts support projects from planning through commissioning and, if desired over the entire extended lifespan, e.g. Retrofit for Integrated Drive Systems for an extended lifetime of your machines and plants.

<https://support.industry.siemens.com/cs/ww/en/sc/2286>



#### Service Programs and Agreements

A technical Service Program or Agreement enables you to easily bundle a wide range of services into a single annual or multi-year agreement.

You pick the services you need to match your unique requirements or fill gaps in your organization's maintenance capabilities.

Programs and agreements can be customized as KPI-based and/or performance-based contracts.

<https://support.industry.siemens.com/cs/ww/en/sc/2275>



**Overview**

Online Support – fast, intuitive, whenever you want, wherever you need



**Web**  
[www.siemens.com/online-support](http://www.siemens.com/online-support)

**App**





Scan the QR code for information on our Online Support app.



**FAQ / Application examples**  
 Information about industrial products, programming and configuration as well as application examples

**Technical information**  
 Videos, documentation, manuals, updates, product notes, compatibility tool, certificates, planning data such as dimensional drawings, product data, 3D models

**Forum**  
 Exchange information and experience with other users and experts

## Online Support for Siemens Industry Products

Siemens Industry and Online Support with some 1.7 million visitors per month is one of the most popular web services provided by Siemens. It is the central access point for comprehensive technical know-how about products, systems and services for automation and drives applications as well as for process industries.

In connection with the challenges and opportunities related to digitalization you can look forward to continued support with innovative offerings.

## Appendix

### Software licenses

#### Overview

##### Software types

Software requiring a license is categorized into types. The following software types have been defined:

- Engineering software
- Runtime software

##### Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third-parties free-of-charge.

##### Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of supply can be found in the readme file supplied with the relevant product(s).

##### License types

Siemens Industry Automation & Drive Technologies offers various types of software license:

- Floating license
- Single license
- Rental license
- Rental floating license
- Trial license
- Demo license
- Demo floating license

##### Floating license

The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.

A license is required for each concurrent user.

##### Single license

Unlike the floating license, a single license permits only one installation of the software per license.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per instance, per axis, per channel, etc.

One single license is required for each type of use defined.

##### Rental license

A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific period of time (the operating hours do not have to be consecutive).

One license is required for each installation of the software.

##### Rental floating license

The rental floating license corresponds to the rental license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

##### Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

##### Demo license

The demo license support the "sporadic use" of engineering software in a non-productive context, for example, use for testing and evaluation purposes. It can be transferred to another license. After the installation of the license key, the software can be operated for a specific period of time, whereby usage can be interrupted as often as required.

One license is required per installation of the software.

##### Demo floating license

The demo floating license corresponds to the demo license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

##### Certificate of License (CoL)

The CoL is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

##### Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

##### Delivery versions

Software is constantly being updated.

The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

##### PowerPack

PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.

A separate PowerPack must be purchased for each original license of the software to be replaced.

##### Upgrade

An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.

The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.

A separate upgrade must be purchased for each original license of the software to be upgraded.

**Overview****ServicePack**

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

**License key**

Siemens Industry Automation & Drive Technologies supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

**Software Update Service (SUS)**

As part of the SUS contract, all software updates for the respective product are made available to you free of charge for a period of one year from the invoice date. The contract will automatically be extended for one year if it is not canceled three months before it expires.

The possession of the current version of the respective software is a basic condition for entering into an SUS contract.

You can download explanations concerning license conditions from [https://mall.industry.siemens.com/legal/ww/en/terms\\_of\\_trade\\_en.pdf](https://mall.industry.siemens.com/legal/ww/en/terms_of_trade_en.pdf)

**Appendix**  
Software licenses

### 1. General Provisions

By using this catalog you can purchase products (hardware, software and services) described therein from Siemens Aktiengesellschaft subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Please note that the scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany.

#### 1.1 For customers with a seat or registered office in European Union

For customers with a seat or registered office in European Union, the following terms and conditions apply subordinate to T&C:

- for products, which include specific terms and conditions in the description text, these specific terms and conditions shall apply and subordinate thereto,
- for stand-alone software products and software products forming a part of a product or project, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany"<sup>1)</sup> and/or
- for consulting services the "Allgemeine Geschäftsbedingungen für Beratungsleistungen der Division DF – Deutschland" (available only in German) and/or
- for other services, the „Supplementary Terms and Conditions for Services ("BL")"<sup>1)</sup> and/or
- for other supplies the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"<sup>1)</sup>.

In case such supplies should contain Open Source Software, the conditions of which shall prevail over the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"<sup>1)</sup>, a notice will be contained in the scope of delivery in which the applicable conditions for Open Source Software are specified. This shall apply mutatis mutandis for notices referring to other third party software components.

#### 1.2 For customers with a seat or registered office outside European Union

For customers with a seat or registered office outside European Union, the following terms and conditions apply subordinate to T&C:

- for products, which include specific terms and conditions in the description text, these specific terms and conditions shall apply and subordinate thereto,
- for consulting services the "Standard Terms and Conditions for Consulting Services of the Division DF for Customers with a Seat or Registered Office Outside of Germany"<sup>1)</sup> and/or
- for other services the "International Terms & Conditions for Services"<sup>1)</sup> supplemented by "Software Licensing Conditions"<sup>1)</sup> and/or
- for other supplies of hard- and software the "International Terms & Conditions for Products"<sup>1)</sup> supplemented by "Software Licensing Conditions"<sup>1)</sup>

#### 1.3 For customers with master or framework agreement

To the extent our supplies and/or services offered are covered by an existing master or framework agreement, the terms and conditions of that agreement shall apply instead of T&C.

### 2. Prices

The prices are in € (Euro) ex point of delivery, exclusive of packaging.

The sales tax (value added tax) is not included in the prices. It shall be charged separately at the respective rate according to the applicable statutory legal regulations.

Prices are subject to change without prior notice. We will charge the prices valid at the time of delivery.

To compensate for variations in the price of raw materials (e.g. silver, copper, aluminum, lead, gold, dysprosium and neodym), surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The metal factor of a product indicates the basic official price (for those raw materials concerned) as of which the surcharges on the price of the product are applied, and with what method of calculation.

An exact explanation of the metal factor can be downloaded at: [https://mall.industry.siemens.com/legal/ww/en/terms\\_of\\_trade\\_en.pdf](https://mall.industry.siemens.com/legal/ww/en/terms_of_trade_en.pdf)

To calculate the surcharge (except in the cases of dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used.

To calculate the surcharge applicable to dysprosium and neodym ("rare earths"), the corresponding three-month basic average price in the quarter prior to that in which the order was received or the release order was effected is used with a one-month buffer (details on the calculation can be found in the explanation of the metal factor).

### 3. Additional Terms and Conditions

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches apply only to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the individual pages of this catalog – especially with regard to data, dimensions and weights given – these are subject to change without prior notice.

<sup>1)</sup> The text of the Terms and Conditions of Siemens AG can be downloaded at [https://mall.industry.siemens.com/legal/ww/en/terms\\_of\\_trade\\_en.pdf](https://mall.industry.siemens.com/legal/ww/en/terms_of_trade_en.pdf)

## Appendix

### Notes

#### 4. Export Regulations

We shall not be obligated to fulfill any agreement if such fulfillment is prevented by any impediments arising out of national or international foreign trade or customs requirements or any embargoes and/or other sanctions.

Export may be subject to license. We shall indicate in the delivery details whether licenses are required under German, European and US export lists.

Our products are controlled by the U.S. Government (when labeled with "ECCN" unequal "N") and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. Government or as otherwise authorized by U.S. law and regulations. Products labeled with "AL" unequal "N" are subject to European / national export authorization.

The export indications can be viewed in advance in the description of the respective goods on the Industry Mall, our online catalog system. Only the export labels "AL" and "ECCN" indicated on order confirmations, delivery notes and invoices are authoritative.

Products without label, with label "AL:N" / "ECCN:N", or label "AL:9X9999" / "ECCN: 9X9999" may require authorization from responsible authorities depending on the final end-use, or the destination.

If you transfer goods (hardware and/or software and/or technology as well as corresponding documentation, regardless of the mode of provision) delivered by us or works and services (including all kinds of technical support) performed by us to a third party worldwide, you shall comply with all applicable national and international (re-)export control regulations. In any event of such transfer of goods, works and services you shall comply with the (re-) export control regulations of the Federal Republic of Germany, of the European Union and of the United States of America.

Prior to any transfer of goods, works and services provided by us to a third party you shall in particular check and guarantee by appropriate measures that

- there will be no infringement of an embargo imposed by the European Union, by the United States of America and/ or by the United Nations by such transfer, by brokering of contracts concerning those goods, works and services or by provision of other economic resources in connection with those goods, works and services, also considering the limitations of domestic business and prohibitions of by-passing those embargoes;
- such goods, works and services are not intended for use in connection with armaments, nuclear technology or weapons, if and to the extent such use is subject to prohibition or authorization, unless required authorization is provided;
- the regulations of all applicable Sanctioned Party Lists of the European Union and the United States of America concerning the trading with entities, persons and organizations listed therein are considered.

If required to enable authorities or us to conduct export control checks, you, upon request by us, shall promptly provide us with all information pertaining to the particular end customer, the particular destination and the particular intended use of goods, works and services provided by us, as well as any export control restrictions existing.

You acknowledge that under the EU embargo regulations against Iran, Syria and Russia respectively the sale of certain listed goods and related services is subject to authorization by the competent export control authorities of the European Union. If (i) the goods or services ordered by you are destined for Iran, Syria or Russia, and (ii) the contract for our supplies and/or services is subject to prior authorization of the competent export control authorities of the European Union, the contract between you and us shall come into force in this respect only upon granting of such authorization.

The products listed in this catalog may be subject to European/German and/or US export regulations. Any export requiring approval is therefore subject to authorization by the relevant authorities.

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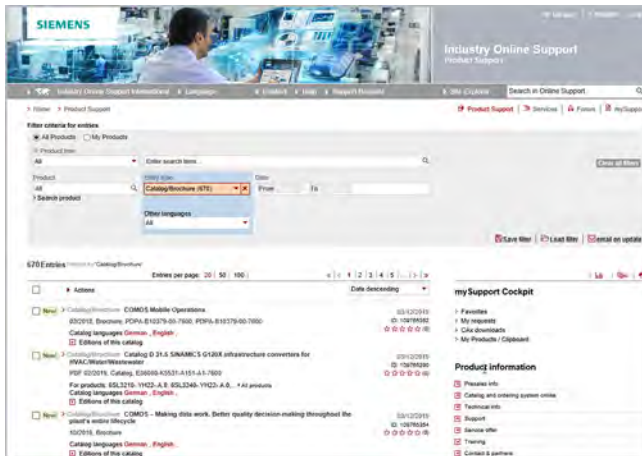
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