Product data sheet
Characteristics

TM241CE24R
Logic controller, Modicon M241, 24 IO relay Ethernet

Main

Range of product	Modicon M241
Product or component type	Logic controller
[Us] rated supply voltage	100...240 V AC
Discrete input number	14, discrete input 8 fast input conforming to IEC 61131-2 Type 1
Discrete output type	Relay Transistor
Discrete output number	6 relay 4 transistor 4 fast output
Discrete output voltage	5...125 V DC for relay output 5...250 V AC for relay output 24 V DC for transistor output
Discrete output current	2 A for relay output (Q4...Q9) 0.1 A for fast output (PTO mode) (TR0...TR3) 0.5 A for transistor output (TR0...TR3)

Complementary

Discrete I/O number	24
Maximum number of I/O expansion module	7 (local I/O-Architecture) 14 (remote I/O-Architecture)
Supply voltage limits	85…264 V
Network frequency	50/60 Hz
Discrete input logic	Sink or source
Discrete input voltage	24 V
Discrete input voltage type	DC
Voltage state 1 guaranteed	>= 15 V for input
Voltage state 0 guaranteed	<= 5 V for input
Discrete input current	5 mA for input
Input impedance	4.7 kOhm for input
Response time	50 µs turn-on, I0...I13 terminal(s) for input
Configurable filtering time	1 µs for fast input
Discrete output logic	Positive logic (source)
Output voltage limits	125 V DC relay output 30 V DC transistor output 277 V AC relay output
Maximum output frequency	1 KHz for transistor output 20 KHz for fast output (PWM mode) 100 kHz for fast output (PLS mode)
Accuracy	+/- 0.1 % at 0.02…0.1 kHz for fast output +/- 1 % at 0.1…1 kHz for fast output
Protection type	Short-circuit protection for transistor output Short-circuit and overload protection with automatic reset for transistor output Reverse polarity protection for transistor output Without protection for relay output
Reset time	10 Ms automatic reset output 12 s automatic reset fast output
Memory capacity	8 MB for program 64 MB for system memory RAM
Data backed up	128 MB built-in flash memory for backup of user programs
Data storage equipment	<= 16 GB SD card (optional)

Battery type	BR2032 lithium non-rechargeable, battery life: 4 year(s)
Backup time	2 years at 25 °C
Execution time for 1 KInstruction	0.3 Ms for event and periodic task 0.7 ms for other instruction
Application structure	8 external event tasks 3 cyclic master tasks + 1 freewheeling task 8 event tasks 4 cyclic master tasks
Realtime clock	With
Clock drift	<= 60 s/month at 25 °C
Positioning functions	PTO function 4 channel(s) (positioning frequency: 100 kHz)
Counting input number	4 fast input (HSC mode) at 200 kHz 14 standard input at 1 kHz
Control signal type	A/B at 100 kHz for fast input (HSC mode) Pulse/Direction at 200 kHz for fast input (HSC mode) Single phase at 200 kHz for fast input (HSC mode)
Integrated connection type	Non isolated serial link serial 1 with RJ45 connector and RS232/RS485 interface Non isolated serial link serial 2 with removable screw terminal block connector and RS485 interface USB port with mini B USB 2.0 connector Ethernet with RJ45 connector
Supply	(serial 1)serial link supply: 5 V, <200 mA
Transmission rate	1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m for RS485 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m for RS232 480 Mbit/s for bus length of 3 m for USB 10/100 Mbit/s for Ethernet
Communication port protocol	Non isolated serial link: Modbus master/slave
Port Ethernet	10BASE-T/100BASE-TX - 1 port(s) copper cable
Ethernet services	FDR DHCP server via TM4 Ethernet switch network module DHCP client embedded Ethernet port SMS notifications Updating firmware SNMP client/server Programming NGVL Monitoring IEC VAR ACCESS FTP client/server Downloading SQL client Modbus TCP client I/O scanner Ethernet/IP originator I/O scanner embedded Ethernet port Ethernet/IP target, Modbus TCP server and Modbus TCP slave Send and receive email from the controller based on TCP/UDP library Web server (WebVisu & XWeb system) OPC UA server DNS client
Local signalling	1 LED (green) for PWR 1 LED (green) for RUN 1 LED (red) for module error (ERR) 1 LED (red) for I/O error (I/O) 1 LED (green) for SD card access (SD) 1 LED (red) for BAT 1 LED (green) for SL1 1 LED (green) for SL2 1 LED (red) for bus fault on TM4 (TM4) 1 LED per channel (green) for I/O state 1 LED (green) for Ethernet port activity
Electrical connection	Removable screw terminal blockfor inputs and outputs (pitch 5.08 mm) Removable screw terminal blockfor connecting the 24 V DC power supply (pitch 5.08 mm)
Maximum cable distance between devices	Unshielded cable: <50 m for input Shielded cable: <10 m for fast input Unshielded cable: <50 m for output Shielded cable: <3 m for fast output
Insulation	Between supply and internal logic at 500 V AC Non-insulated between supply and ground
Marking	CE
Sensor power supply	24 V DC at 400 mA supplied by the controller

Surge withstand	2 KV power lines (AC) common mode conforming to EN/IEC 61000-4-5 2 KV relay output common mode conforming to EN/IEC 61000-4-5 1 KV shielded cable common mode conforming to EN/IEC 61000-4-5 1 KV power lines (AC) differential mode conforming to EN/IEC 61000-4-5 1 KV relay output differential mode conforming to EN/IEC 61000-4-5 1 KV input common mode conforming to EN/IEC 61000-4-5 1 kV transistor output common mode conforming to EN/IEC 61000-4-5
Web services	Web server
Maximum number of connections	8 Modbus server 8 SoMachine protocol 10 web server 4 FTP server 16 Ethernet/IP target 8 Modbus client
Number of slave	64 Modbus TCP: 16 EtherNet/IP:
Cycle time	10 Ms 16 EtherNet/IP 64 ms 64 Modbus TCP
Mounting support	Top hat type TH35-15 rail conforming to IEC 60715 Top hat type TH35-7.5 rail conforming to IEC 60715 Plate or panel with fixing kit
Height	90 mm
Depth	95 mm
Width	150 mm
Net weight	0.53 kg

Environment

Standards	ANSI/ISA 12-12-01 CSA C22.2 No 142 CSA C22.2 No 213 EN/IEC 61131-2:2007 Marine specification (LR, ABS, DNV, GL) UL 1604 UL 508
Product certifications	RCM CSA IACS E10 cULus
Resistance to electrostatic discharge	8 KV in air conforming to EN/IEC 61000-4-2 4 kV on contact conforming to EN/IEC 61000-4-2
Resistance to electromagnetic fields	10 V/M 80 MHz...1 GHz conforming to EN/IEC 61000-4-3 3 V/M 1.4 GHz...2 GHz conforming to EN/IEC 61000-4-3 1 V/m 2 GHz...3 GHz conforming to EN/IEC 61000-4-3
Resistance to fast transients	2 KV (power lines) conforming to EN/IEC 61000-4-4 2 KV (relay output) conforming to EN/IEC 61000-4-4 1 KV (Ethernet line) conforming to EN/IEC 61000-4-4 1 KV (serial link) conforming to EN/IEC 61000-4-4 1 KV (input) conforming to EN/IEC 61000-4-4 1 kV (transistor output) conforming to EN/IEC 61000-4-4
Resistance to conducted disturbances	10 V 0.15...80 MHz conforming to EN/IEC 61000-4-6 3 V 0.1...80 MHz conforming to Marine specification (LR, ABS, DNV, GL) 10 V spot frequency (2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz) conforming to Marine specification (LR, ABS, DNV, GL)
Electromagnetic emission	Conducted emissions - test level: 120...69 dBµV/m QP (power lines) at 10…150 kHz conforming to EN/IEC 55011 Conducted emissions - test level: 63 dBµV/m QP (power lines) at 1.5…30 MHz conforming to EN/IEC 55011 Conducted emissions - test level: 79 dBµV/m QP/66 dBµV/m AV (power lines) at 0.15…0.5 MHz conforming to EN/IEC 55011 Conducted emissions - test level: 73 dBµV/m QP/60 dBµV/m AV (power lines) at 0.5…300 MHz conforming to EN/IEC 55011 Radiated emissions - test level: 40 dBµV/m QP class A (10 m) at 30…230 MHz conforming to EN/IEC 55011 Conducted emissions - test level: 79...63 dBµV/m QP (power lines) at 150…1500 kHz conforming to EN/IEC 55011 Radiated emissions - test level: 47 dBµV/m QP class A (10 m) at 230…1000 MHz conforming to EN/IEC 55011
Immunity to microbreaks	10 ms
Ambient air temperature for operation	-10…50 °C (vertical installation) -10…55 °C (horizontal installation)
Ambient air temperature for storage	-25…70 °C

Relative humidity	10…95 %, without condensation (in operation) 10…95 %, without condensation (in storage)
IP degree of protection	IP20 with protective cover in place
Pollution degree	2
Operating altitude	0...2000 m
Storage altitude	0…3000 m
Vibration resistance	3.5 mm at 5…8.4 Hz on symmetrical rail 3 gn at 8.4…150 Hz on symmetrical rail 3.5 mm at 5…8.4 Hz on panel mounting 3 gn at 8.4…150 Hz on panel mounting
Shock resistance	15 gn for 11 ms

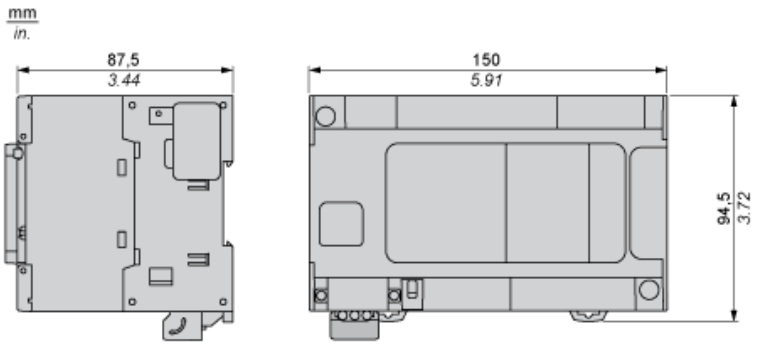
Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Weight	760.0 g
Package 1 Height	11.208 cm
Package 1 width	13.04 cm
Package 1 Length	18.656 cm
Unit Type of Package 2	S03
Number of Units in Package 2	8
Package 2 Weight	6.97 kg
Package 2 Height	30 cm
Package 2 width	30 cm
Package 2 Length	40 cm

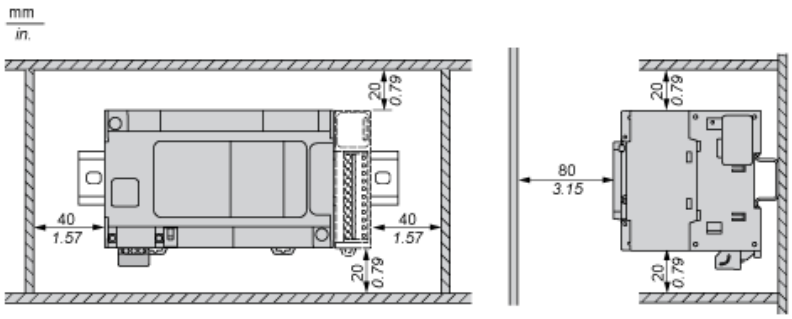
Offer Sustainability

Sustainable offer status	Green Premium product
REACh Regulation	REACh Declaration
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS Declaration
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End Of Life Information
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins
PVC free	Yes

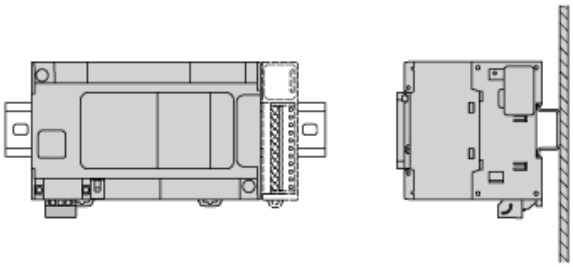
Dimensions



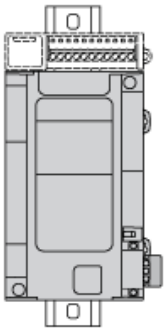
Clearance



Mounting Position

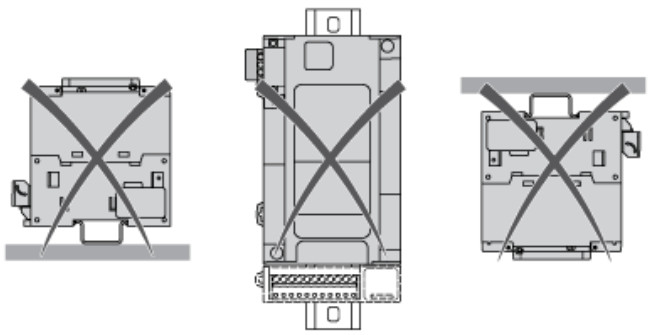


Acceptable Mounting



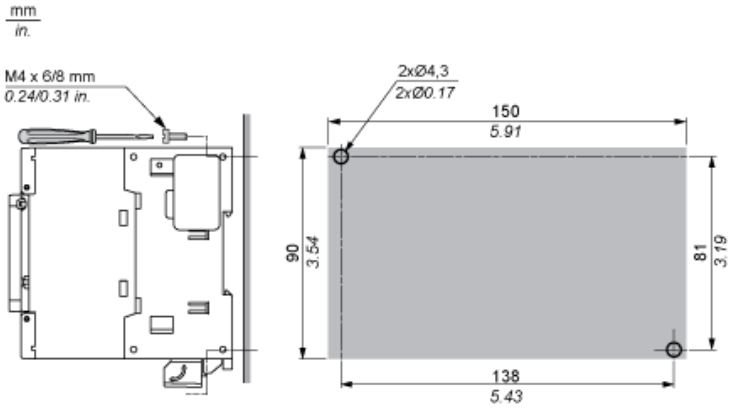
NOTE: Expansion modules must be mounted above the logic controller.

Incorrect Mounting



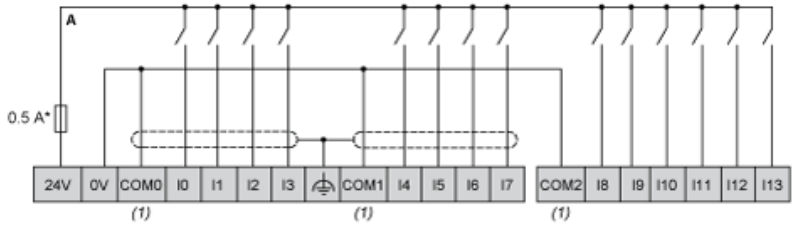
Direct Mounting On a Panel Surface

Mounting Hole Layout



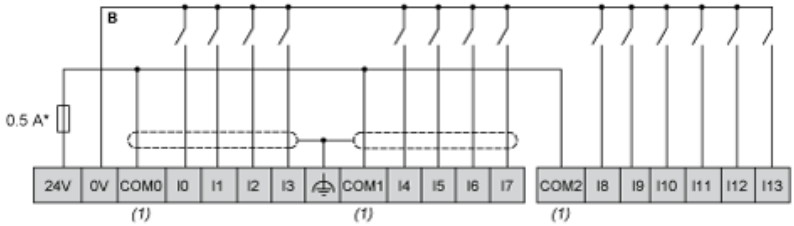
Digital Inputs

Wiring Diagram (Positive Logic)



(*) : Type T fuse
(1) : The COM0, COM1 and COM2 terminals are not connected internally.

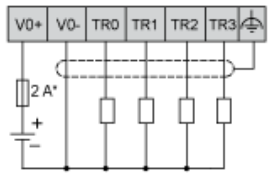
Wiring Diagram (Negative Logic)



(*) : Type T fuse
(1) : The COM0, COM1 and COM2 terminals are not connected internally.

Fast Transistor Outputs

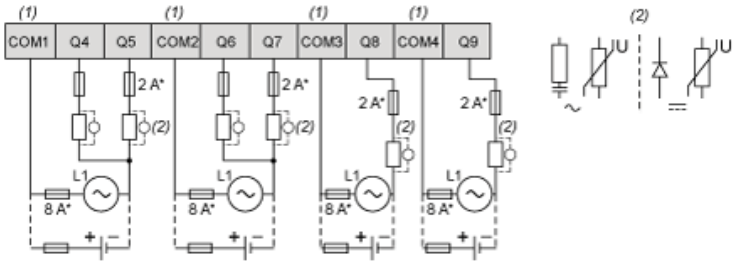
Wiring Diagram



(*) : 2 A fast-blow fuse

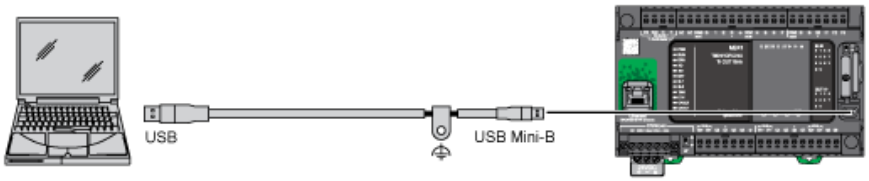
Relay Outputs

Wiring Diagram



(*) : Type T fuse
(1) : The terminals COM1 to COM4 are not connected internally.
(2) : To improve the life time of the contacts, and to protect from potential inductive load damage, you must connect a free wheeling diode in parallel to each inductive DC load or an RC snubber in parallel of each inductive AC load

USB Mini-B Connection



Ethernet Connection to a PC