



## M-Bus Interface Description

M-Bus

### M-Bus Converter for Energy Valve™ 4 and Thermal Energy Meter

Edition 2023-02

**BELIMO**<sup>®</sup>

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# General notes

## General information

Date	15.01.2022
Vendor Name	BELIMO Automation AG
Vendor ID	423
Product Name	Converter M-Bus
Product Model Number	G-22PEM-A01
Protocol	M-Bus: EN 13757-3:2018

## Compatible products M-Bus

Product Model Number	EV..R2+MID, EV..R2+(K)BAC, 22PEM-1U.., 22PE-1U..
Transmission Format	1-8-E-1
Baud Rates	300, 600, 1'200, 2'400, 4'800, 9'600
Primary Address	0...250 (Default: 0)
Secondary Address	000000 if no device is connected to it, otherwise calculated form device serial number
Manufacturer	BLM

## Parametrisation EV / TEM

Tool	through the integrated webserver or Belimo Assistent App
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**Important Note:** The Thermal Energy Meters 22PEM-1U.. / 22PE-1U.. or the Belimo Energy Valve™ EV..R2+MID / EV..R2+(K)BAC must be set to MP-Bus with the Belimo Assistent App or the Belimo web server. The corresponding MP address is PP.

## Web server

## Parametrisation M-Bus

Tool	commercially available M-Bus tools
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**Note:** The system integration of the M-Bus converter on M-Bus and the assignment of the M-Bus address is done with a commercially available M-Bus tool.

## Application Reset

"Application Reset" (CI field: 50<sub>16</sub>) message must be issued.  
Sub-code must be a hexadecimal number.  
00<sub>16</sub> : Reset to default read out (actual values / metric units / real time data)

## Metric / imperial units

To select the data units the "Application Reset" (50<sub>16</sub>) message must be issued.  
Sub-code must be a hexadecimal number.  
20<sub>16</sub> : metric units (actual and historical values)  
21<sub>16</sub> : imperial units (actual and historical values)

## Historical data

The converter stores 12 months of data. To select the communication of historical data use the "Application Reset" (50<sub>16</sub>) message, where the code selects the month to be transmitted. If no datas are present in selected month, an ACK message is sent instead of the data message.

30<sub>16</sub> : request all month (each REQ-UD2 you get one month back for a max. of 12 months)  
31<sub>16</sub> : request month 1 (end of last month or January recent past)  
32<sub>16</sub> : request month 2  
33<sub>16</sub> : request month 3  
34<sub>16</sub> : request month 4  
35<sub>16</sub> : request month 5  
36<sub>16</sub> : request month 6  
37<sub>16</sub> : request month 7  
38<sub>16</sub> : request month 8  
39<sub>16</sub> : request month 9  
3A<sub>16</sub> : request month 10  
3B<sub>16</sub> : request month 11  
3C<sub>16</sub> : request month 12

## Read out data

REQ-UD2

## M-Bus state

RSP-UD. Is already partially coded in M-Bus specifications.  
The status byte is used to indicate different potential errors in the meter.

Bit	true	false
0,1	See table below	See table below
2	Power low	Power OK
3	Permanent error	No permanent error
4	Temporary error	No permanent error
5	Manufacturer specific	Manufacturer specific
6	Manufacturer specific	Manufacturer specific
7	Manufacturer specific	Manufacturer specific

Bit 1	Bit 2	Description
0	0	No error
0	1	Application busy
1	0	Any application error
1	1	Abnormal condition / alarm

**Primary address**

Primary address can be changed by commercially available M-Bus tools.

**Secondary address**

Secondary address can be changed by commercially available M-Bus tools. Therefore, send a "Set Secondary Address" (CI field: 52<sub>16</sub>) message. Calculated secondary address will still be available as read out data ID15.

**Change baud rate of M-Bus**

The baud rate can be changed by commercially available M-Bus tools. Select the "Set Baud rate" (CI field: B8<sub>16</sub> - BD<sub>16</sub>) function and set the new baud rate.

**Replacement converter**

The protocol converter device can be replaced with a new one. Before replacing the unit, all data must be read out from device, as they will be lost. Then you can replace with a new unit, that will retain the secondary address but will have primary address equal to zero.

**Replacement meter**

The meter connected to the protocol converter device can be replaced with a new one. Before replacing the meter, all data must be read out from protocol converter device, as they will be lost. Then it can be replaced with a new meter. The protocol converter will have a new secondary address derived from the meter serial number and a primary address equal to zero.

# Datapoints overview

<b>ID</b>	<b>Name</b>	<b>Unit</b>
1	Error flags	-
2	Operating time	Seconds
3	Operating time	Seconds
4	Other software version #	-
5	Fabrication # (series number meter)	-
6	Firmware version #	-
7	Fabrication # (series number Energy Valve™)	-
8	Identification # (secondary address)	-
9	Model version #	-
10	Volume	l
11	Volume flow	l/h
12	Return temperature	°C
13	Flow temperature	°C
14	Temperature difference	K
15	Energy accumulation positive	kWh
16	Energy accumulation negative	kWh
17	Power	W
18	Time point	-
19	Time point	-

## Datapoints description

No.	Datapoint	Description	Unit																																																			
1	Error flag	Error code	-																																																			
		<table border="1"> <thead> <tr> <th>Bit</th> <th>Energy Valve™ V4</th> <th>Thermal Energy Meter</th> </tr> </thead> <tbody> <tr><td>0</td><td>No communication to actuator</td><td>-</td></tr> <tr><td>1</td><td>Gear train disengaged</td><td>-</td></tr> <tr><td>2</td><td>Actuator cannot move</td><td>-</td></tr> <tr><td>3</td><td>Reverse flow</td><td>Reverse flow</td></tr> <tr><td>4</td><td>Flow setpoint not reached</td><td>-</td></tr> <tr><td>5</td><td>Flow with closed valve</td><td>-</td></tr> <tr><td>6</td><td>Actual flow exceeds <math>V'_{nom}</math></td><td>Actual flow exceeds <math>V'_{nom}</math></td></tr> <tr><td>7</td><td>Flow measurement error</td><td>Flow measurement error</td></tr> <tr><td>8</td><td>Remote temperature error</td><td>Remote temperature error</td></tr> <tr><td>9</td><td>Flowbody temperature error</td><td>Flowbody temperature error</td></tr> <tr><td>10</td><td>Com. to sensor interrupted</td><td>Com. to sensor interrupted</td></tr> <tr><td>11</td><td>Freeze warning</td><td>-</td></tr> <tr><td>12</td><td>Glycol detected</td><td>-</td></tr> <tr><td>13</td><td>Power setpoint not reached</td><td>-</td></tr> <tr><td>14</td><td>-</td><td>-</td></tr> <tr><td>15</td><td>-</td><td>-</td></tr> </tbody> </table>	Bit	Energy Valve™ V4	Thermal Energy Meter	0	No communication to actuator	-	1	Gear train disengaged	-	2	Actuator cannot move	-	3	Reverse flow	Reverse flow	4	Flow setpoint not reached	-	5	Flow with closed valve	-	6	Actual flow exceeds $V'_{nom}$	Actual flow exceeds $V'_{nom}$	7	Flow measurement error	Flow measurement error	8	Remote temperature error	Remote temperature error	9	Flowbody temperature error	Flowbody temperature error	10	Com. to sensor interrupted	Com. to sensor interrupted	11	Freeze warning	-	12	Glycol detected	-	13	Power setpoint not reached	-	14	-	-	15	-	-	
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7	Fabrication number	Series number EnergyValve	-																																																			
8	Identification number	Secondary address	-																																																			
9	Model version number	Model version number	-																																																			
10	Volume	Total volume	l																																																			
11	Volume flow	Actual flow rate	l/h																																																			
12	Return temperature	Temperature 2 (integrated / flowbody)	°C																																																			
13	Flow temperature	Temperature 1 (external)	°C																																																			
14	Temperature difference	Temperature difference	K																																																			
15	Energy accumulation negative	Cooling energy	kWh																																																			
16	Energy accumulation positive	Heating energy	kWh																																																			
17	Power	Power	W																																																			
18	Time point	Actual local date time	-																																																			
19	Time point	Local date time, error starting date and time	-																																																			

# All inclusive.

Belimo as a global market leader develops innovative solutions for the controlling of heating, ventilation and air-conditioning systems. Damper actuators, control valves, sensors and meters represent our core business.

Always focusing on customer value, we deliver more than only products. We offer you the complete product range for the regulation and control of HVAC systems from a single source. At the same time, we rely on tested Swiss quality with a five-year warranty. Our worldwide representatives in over 80 countries guarantee short delivery times and comprehensive support through the entire product life. Belimo does indeed include everything.

The "small" Belimo devices have a big impact on comfort, energy efficiency, safety, installation and maintenance.

In short: Small devices, big impact.



5-year warranty



On site around the globe



Complete product range



Tested quality



Short delivery times



Comprehensive support



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