

# Data sheet

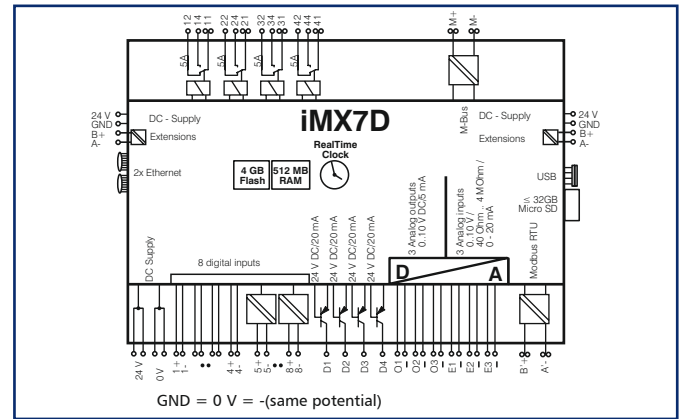
## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

### Illustration



### Wiring diagram



### Product specification

Das EWIO<sub>2</sub>-M-BM is a powerful data logger for the energy consumption monitoring and energy monitoring in buildings, on machines, plants and systems. Two Ethernet ports with a Daisy Chain function are available for the chain further Data logger and connection to a LAN network. The EWIO<sub>2</sub>-M-BM can be integrated into a Modbus TCP or BACnet/IP network to perform control tasks. The system is parameterised, configured and commissioned through a platform-independent web browser. The M-Bus and Modbus RTU interfaces enable to read different meters: e.g. electricity, water, gas and heat. Optionally, the measured values can either be sent from the data base (push) or read out (pull) via mail (SSL) or FTP (SFTP), from a BACnet or Modbus controller. Simple functions and control tasks in building or industrial automation can be created and visualized via the graphic programming interface „Node-RED“ integrated in the web interface and the numerous digital and analog I/Os. An integrated  $\mu$ SD memory card expands the range of functions of the EWIO<sub>2</sub>-M-BM for save settings, data and applications.

# Data sheet

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

Part no.

110935

EAN 4251394629810

2023-10-31

Version G

Technical Data	
<b>General Features</b>	
Network	2 Port Ethernet LAN 10/100 BaseT Daisy-Chain
Protocol	TCP/IP, BACnet/IP, Modbus TCP
M-Bus	for 80 M-Bus charges
BACnet device profile according to DIN EN ISO 16484-5	B-ASC
RJ45 jack according to	EN 60603-7-51 Ed.1 (12/2008)
<b>Interfaces</b>	
max. 6 MR-I/O modules expandable (second NG4 necessary)	1x extension bus for I/O modules (MR-series) by jumper plug
max. 32 Modbus RTU subscribers	1x Modbus RTU, e.g. counter
Service interface	USB-A
Memory card slot (4 GB integrated)	µSD max. 32 GB
Operating temperature	-5° to 55° C
Storage temperature	-25° to 70° C

Mechanical Features	
Dimensions (W x H x D)	125 x 93 x 60,81 mm
Housing	45 mm front height / 7 HP
Side-by-side mounting	without spacing
Mounting position	user defined, recommended horizontally
Weight	397 g
Protection class (IEC 60529)	IP20
Impact resistance (IEC 62262)	IK06
Mounting on standard rail	TH35 (IEC 60715)
Terminal blocks	two-tier screw type
Conductor cross-section	0,33 – 2,5 mm <sup>2</sup> / AWG 22 – 12

# Data sheet

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

Part no.

110935

EAN 4251394629810

2023-10-31

Version G

### Technical Data

#### Electrical Features

Nominal voltage	24 V DC ± 10%
Nominal current (max.)	500 mA
Power dissipation (max.)	12 Watt

#### Materials

Housing upper part	polycarbonate
Housing color upper part	translucent
Housing lower part	polyamide
Housing color lower part	black
Housing cover	polyamide
Color of housing cover	light gray

#### Controller unit

Processor	NXP i.MX7D Dual Core ARM-A7, 1 GHz
Internal memory	RAM 512 MB / Flash 4 GB
External memory expansion (up to)	4 GB integrated, expandable to max. 32 GB
Operating system	Linux embedded > 4.9.88 (Debian)
Real Time Clock	
Accuracy of clock	1 s / day
Power drop bridging operation	10 h

#### Visualization

Operating indicators	LED
Power on	green
Boot up activity / failure	red
Ethernet Link	green
10/100 MBit	yellow
Status indication	LED
Switching status	yellow
Cable length adjustment	yellow
One-man operation	yellow

# Data sheet

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

Part no.

110935

EAN 4251394629810

2023-10-31

Version G

### Technical Data

Inputs and Outputs	
<b>Digital inputs</b>	
8x inputs or 8x S0 inputs of these, 4x contact inputs for potential-free switches	
Switching voltage	15 Volt DC $\pm$ 10 %
Switching threshold	5 Volt $\pm$ 10 %
Switching current	$\geq$ 1 mA
Metering function	max. 80 Hz input frequency
Inputs for externally supplied switching states	4x galvanically isolated (DI5, DI6, DI7, DI8)
max. switching voltage	24 Volt AC/DC $\pm$ 10 %
Status display for each input	LED yellow
<b>Analog inputs</b>	
Quantity	3x individually configurable resistance or voltage/current inputs
Resistance range	40 Ohm - 4 MOhm
Voltage range	0 to 10 V DC
Current range	0 to 20 mA
Resolution	15 Bit
Measuring range end value failure	0.1 % at voltage and current measurement < 0,1 % at resistance measurement < 12 k $\Omega$ < 1,0 % at resistance measurement > 12 k $\Omega$
Input resistance	1 M $\Omega$ , 2% at voltage measurement 200 $\Omega$ , 1% at current measurement

# Data sheet

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

Part no.

110935

EAN 4251394629810

2023-10-31

Version G

### Technical Data

The following sensor types are supported, whose measured values are then converted into temperature values:

Sensor type	Measuring area
0(2)...10 V	0...100 %
KP10	-50...+150 °C
KP250	-50...+150 °C
ML2	-50...+150 °C
Ni100	-50...+150 °C
Ni1000 (DIN)	-50...+150 °C
Ni1000 (L&G)	-50...+150 °C
Ni1000 (Carel)	-50...+150 °C
NTC1,8K	-50...+150 °C
NTC5K	-50...+150 °C
NTC10K	-40...+150 °C
NTC10KPRE	-50...+150 °C
NTC20K	-30...+150 °C
PT100	-100...+850 °C
PT1000	-100...+850 °C
Balco500	-40...+150 °C
Satchwell DC1100	-20...+120 °C
Satchwell DC1400	-40...+120 °C

# Data sheet

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

Part no.

110935

EAN 4251394629810

2023-10-31

Version G

### Technical Data

Inputs and Outputs	
<b>Relay outputs</b>	
DPST Relay	4x
Contact material	AgSnO <sub>2</sub>
Switching current	max. 6 A/230 V ohmic load
Isolation voltage	1000 V <sub>RMS</sub> (open contacts) 4000 V <sub>RMS</sub> (contact - coil; >= 5.5 mm)
Status display for each relay	LED yellow
Manual control for each relay	tact
Switching automatic / manual operation	press tact > 1 s
Clearance and creepage distances relay coil - contact	>= 5.5 mm
<b>Digital outputs</b>	
Transistor outputs	4x switchable with current limit
Switching voltage	24 Volt (= operating voltage)
Switching current	max. 20 mA
Status display for each output	LED yellow
<b>Analog outputs</b>	
Analog outputs	3x
Voltage range	0 to 10 V DC
Output current	max. 5 mA , load 2 kΩ
Resolution	14 Bit
Failure	< 1%
Status display for each output	LED yellow, brightness changes according to the output voltage
Manual control facility for each output	5 buttons. 3 for selecting the output, 2 to change the voltage

# Data sheet

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

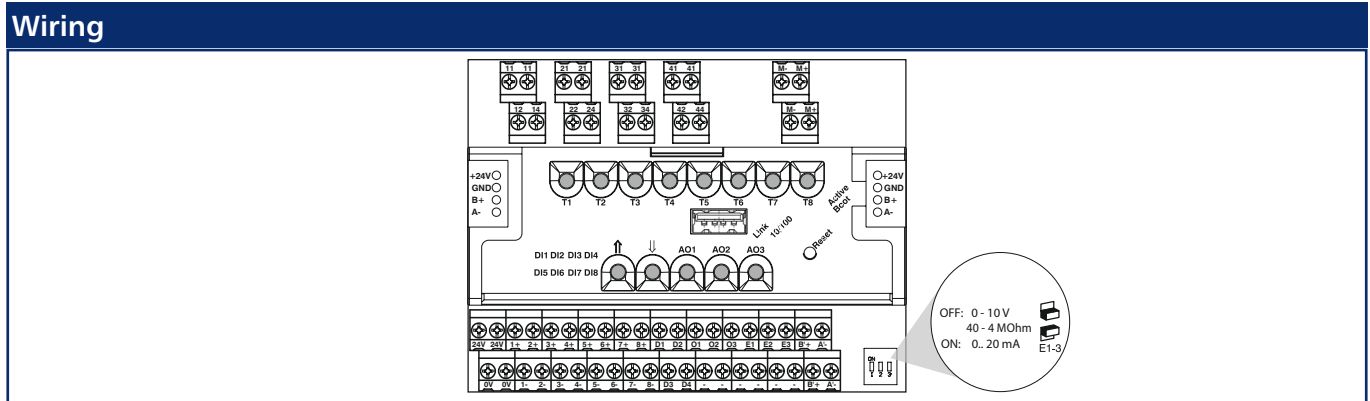
Part no.

110935

EAN 4251394629810

2023-10-31

Version G



Description	Button	Contacts	LED display	
Relay output changeover contacts 6 A	T1	11-12-14	T1   ON (yellow)	
	T2	21-22-24	T2   ON (yellow)	
	T3	31-32-34	T3   ON (yellow)	
	T4	41-42-44	T4   ON (yellow)	
Analog output 0-10 V	AO1/	O1/-	O1   ON (yellow)	
	AO2/	O1/-	O2   ON (yellow)	
	AO3/	O3/-	O2   ON (yellow)	
Digital output 24 V / 20 mA	T5	D1/-		
	T6	D2/-		
	T7	D3/-		
	T8	D4/-		
Analog input 0-10 V / 40-4 MOhm / 0-20 mA		E1/-	see picture above	
		E2/-		
		E3/-		
Digital Input	(T1)	1+/1-	D1   ON (yellow)	
	(T2)	2+/2-	D2   ON (yellow)	
	(T3)	3+/3-	D3   ON (yellow)	
	(T4)	4+/4-	D4   ON (yellow)	
	(T5)	5+/5-	galvanically isolated	D5   ON (yellow)
	(T6)	6+/6-		D6   ON (yellow)
	(T7)	7+/7-		D7   ON (yellow)
	(T8)	8+/8-		D8   ON (yellow)

# Data sheet

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

Part no.

110935

EAN 4251394629810

2023-10-31

Version G

### Wiring

Description	Button	Contacts	LED display
Operating Voltage		24 V / 0 V	
Jumper for operating voltage		24 V / GND	
M-Bus		M+/M-   M+/M-	
RS-485 / Modbus RTU		B'+/A'-   B'+/A'-	
Jumper for extension modules		B+/A-   B+/A-	
USB		USB	
Ethernet 10/100 MBit communication interface		RJ45	
Ethernet connection			Link (green)
10/100 MBit connection			100 MBit (yellow)
EWIO <sub>2</sub> -M-BM is ready			Active (green)
EWIO <sub>2</sub> -M-BM boots			Boot (red)
EWIO <sub>2</sub> -M-BM new boot procedure	Reset		Reset (red)



# Data sheet

Page 9/11

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

**Part no.****110935****EAN 4251394629810**

2023-10-31

Version G

### Software specifications

#### Linux typical programs (embedded versions)

##### for system functions:

crond	time control
vsftpd	FTP, FTPS
ifplugd	HotPlug
udhcp	DHCP
sendmail	E-mail
watchdog	Watchdog
busybox	service programs

#### Communication basis

- LAN with static or dynamic address assignment (DHCP)
- Console connection by special cable (USB – serial)
- Bus for extension modules
- RS485

#### Communication protocols web interface

HTTP, HTTPS, JS, CSS, JSON

www	folder with web content, CGI files
webgate	System service for web interface
API	for remote access via web interface

#### System services M-Bus

mbus controller	M-Bus master
mbus_shortCircuit	M-Bus short circuit detection

#### Functions:

- Primary, secondary addressing
- Search at the M-Bus
- Variable Baud rates per M-Bus slave
- Several data telegrams
- Telegram repetition in case of failure
- Freeze function (depending on slave)
- Average determination
- Division factor calculation
- Min./max. analysis

# Data sheet

Page 10/11

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

Part no.

110935

EAN 4251394629810

2023-10-31

Version G

### Software specifications

#### System services BACnet

bacnet-server	BACnet-Server
BBMD	supports registration with foreign devices

#### System services Modbus

modbus-gateway	Modbus gateway
Templates	Templates for facilitated configuration of Modbus devices

#### System functions

##### Update functions

- Update for Kernel (image), Root-FS (image), user space (file based)
- Firmware storage on flash or SD card
- Software reboot

##### Alarm

- Sending of pre-configured mails in case of defined system states (last hardware start, last software start, ethernet link stable since...)
- Sending of e-mails from applications

##### System state

- Display of the last (current) Syslog entries
- Display of memory usage
- Password change for web interface and system

##### Drivers for I/Os, file interface

- digital, analog inputs and outputs
- Sensors (PTxxx) can be directly connected to the EWIO<sub>2</sub>-M-BM

##### Time setting

- NTP
- manually
- Import from the PC
- Time zone setting

##### File transfer for backup, analysis, distribution

- Configuration files
- Measured value files

# Data sheet

## EWIO<sub>2</sub>-M-BM

(M-Bus / BACnet / Modbus)

Part no.  
110935

EAN 4251394629810

2023-10-31  
Version G

### Software specifications

#### Applications (shell, python scripts)

- editable in the web interface
- can be linked with cyclical readout of measured values (for example min./max. monitoring)
- I/O analysis (also of other EWIO<sub>2</sub>-M-BM that can be accessed by TCP/IP)
- Possibility to send e-mails from an application (alarm etc.)

#### Node-RED

- Graphical, data stream oriented development tool
- Editable and visualizable in the web interface
- Visualization as „kiosk mode“
- Search of EWIO<sub>2</sub> in the same network
- Connection to EWIO<sub>2</sub> (also other EWIO<sub>2</sub> accessible via TCP/IP)
- Digital input (Node-RED-node) reacts on change (signal level or pulse meter)
- Analog input (Node-RED-node) reacts to change
- Digital output (Node-RED-node) controls output
- Analog output (Node-RED-node) controls output
- Meter (Node-RED-node) reacts to measured values of meter data points
- Display and selection of data points (I/Os, meters) on EWIO<sub>2</sub> and expansion modules
- Display of live values at the data point
- Pre-installed nodes for M-Bus, Modbus TCP and BACnet/IP
- Additional nodes can be installed via the Node-RED palette

### Dimensional drawing

