

Data sheet

EWIO₂-BM

(Ethernet-IO / BACnet / Modbus)

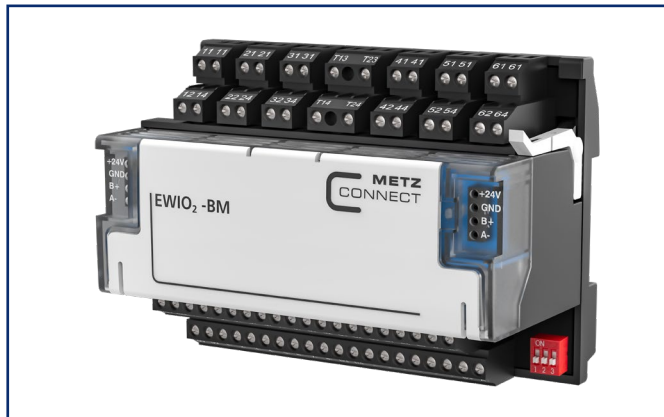
Part no.
110904

EAN **4251394629858**

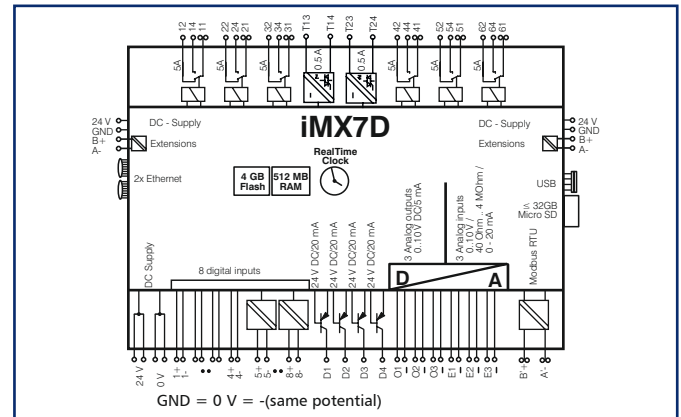
2023-10-31

Version G

Illustration



Wiring diagram



Product specification

Depending on the configuration, the EWIO₂-BM is a compact Modbus and/or BACnet Server, which connects digital and analogue signals from the sensor and actuator level with a Modbus TCP and/or BACnet/IP network. With a Modbus or BACnet Client, various tasks can be realised in building and industrial automation. Two Ethernet-Ports with a Daisy Chain function are available for the connection to the LAN network and the chain further Ethernet I/O devices. 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. The system is parameterised, configured and commissioned through a platform-independent web browser. For the upgrade of the sensor/actuator level, MR-I/O upgrade modules can be connected using plug & play jumper plugs and wiring to a second interface of EWIO₂-BM, Modbus RTU devices. An integrated μ SD memory card expands the range of functions of the EWIO₂-BM for save settings, data and applications.

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Technical Data

| General Features | |
|---|--|
| Network | 2 Port Ethernet LAN 10/100 BaseT Daisy-Chain |
| Protocol | TCP/IP, BACnet/IP, Modbus TCP |
| BACnet device profile according to DIN EN ISO 16484-5 | B-ASC |
| RJ45 jack according to | EN 60603-7-51 Ed.1 (12/2008) |
| Interfaces | |
| max. 6 MR-I/O module expandable (second NG4 necessary) | 1x extension bus for I/O modules (MR-series) by jumper plug |
| max. 32 Modbus RTU subscribers | 1x Modbus RTU |
| 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 |
| Housings | 45 mm front height / 7 HP |
| Side-by-side mounting | without spacing |
| Mounting position | user defined, recommended horizontally |
| Weight | 417 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 ² / AWG 22 – 12 |

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Electrical Features

| | |
|--------------------------|---------------|
| Nominal voltage | 24 V DC ± 10% |
| Nominal current (max.) | 350 mA |
| Power dissipation (max.) | 8,4 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 to 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 |

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| Inputs and Outputs | |
|---|--|
| Digital inputs | |
| 8x inputs or 8x S0 inputs of these, 4x contact inputs for potential-free switches | |
| Switching voltage | 15 Volt DC ± 10 % |
| Switching threshold | 5 Volt ± 10 % |
| Switching current | ≥ 1 mA |
| Metering function | max. 80 Hz input frequency |
| Inputs for externally supplied switching states | galvanically isolated (DI5, DI6, DI7, DI8) |
| max. switching voltage | 24 Volt AC/DC ± 10 % |
| Status display for each input | LED yellow |
| Analog inputs | |
| 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 kΩ < 1,0 % at resistance measurement > 12 kΩ |
| Input resistance | 1 MΩ, 2% at voltage measurement 200 Ω, 1% at current measurement |

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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 |

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| | |
|--|--|
| Inputs and Outputs | |
| Relay outputs | |
| DPST Relay | 6x |
| Contact material | AgSnO ₂ |
| Switching current | max. 6 A/230 V ohmic load |
| Isolation voltage | 1000 V _{RMS} (open contacts) 4000 V _{RMS} (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 |
| Digital outputs | |
| Triac output | |
| Switch on current | 2x / 20 - 250 V AC / 0.5 A 0.8 A (10 s) |
| Transistor outputs | |
| Switching voltage | 4x switchable with current limit 24 Volt (= operating voltage) |
| Switching current | max. 20 mA |
| Status display for each output | LED yellow |
| Analog outputs | |
| 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 |

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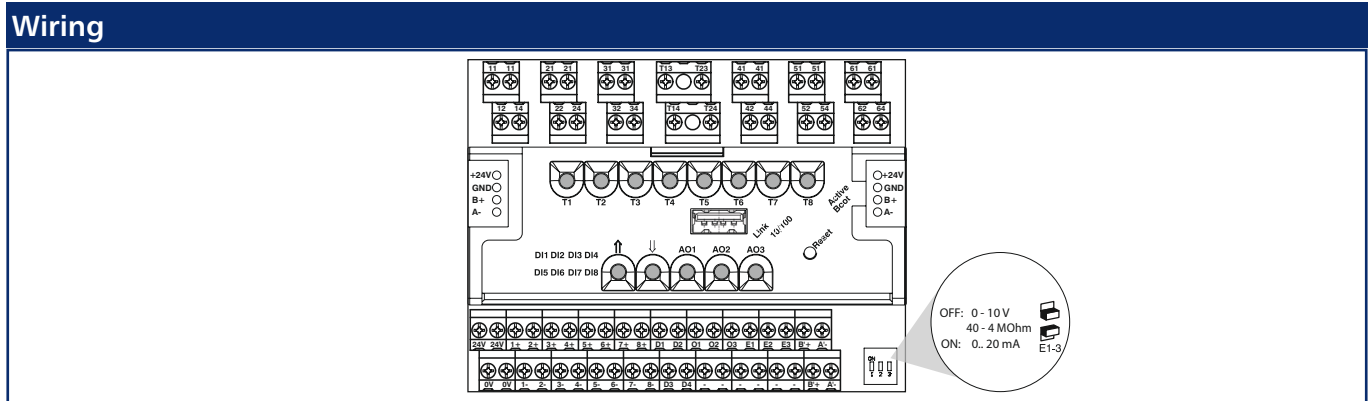
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| Description | Button | Contacts | LED display |
|---|--------|----------|-------------------|
| Relay output changeover contacts 6 A | T1 | 11-12-14 | T1 ON (yellow) |
| | T2 | 21-22-24 | T2 ON (yellow) |
| | T3 | 31-32-34 | T3 ON (yellow) |
| | T6 | 41-42-44 | T6 ON (yellow) |
| | T7 | 51-52-54 | T7 ON (yellow) |
| | T8 | 61-62-64 | T8 ON (yellow) |
| Triac outputs | T4 | T13-T14 | T4 ON (yellow) |
| | T5 | T23-24 | T5 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 | | D1/- | |
| | | D2/- | |
| | | D3/- | |
| | | D4/- | |
| Analog input 0-10 V / 40-4 MOhm / 0-20 mA | | E1/- | see picture above |
| | | E2/- | |
| | | E3/- | |
| Digital Input | | 1+/1- | DI1 ON (yellow) |
| | | 2+/2- | DI2 ON (yellow) |
| | | 3+/3- | DI3 ON (yellow) |
| | | 4+/4- | DI4 ON (yellow) |
| | | 5+/5- | DI5 ON (yellow) |
| | | 6+/6- | DI6 ON (yellow) |
| | | 7+/7- | DI7 ON (yellow) |
| | | 8+/8- | DI8 ON (yellow) |

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Wiring

| Description | Button | Contacts | LED display |
|--|--------|-------------------|-------------------|
| Operating Voltage | | 24 V / 0 V | |
| Jumper for operating voltage | | 24 V / GND | |
| 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 ₂ -BM is ready | | | Active (green) |
| EWIO ₂ -BM boots | | | Boot (red) |
| EWIO ₂ -BM new boot procedure | Reset | | Reset (red) |

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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 |

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Software specifications

System services Modbus

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

System services BACnet

| | |
|---------------|--|
| bacnet-server | BACnet server |
| BBMD | supports registration with foreign 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 EWIO₂-BM

Time setting

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

File transfer for backup, analysis, distribution

- Configuration files
- Measured value files

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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 EWIO₂-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 EWIO₂ in the same network
- Connection to EWIO₂ (also other EWIO₂ 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
- Display and selection of data points (I/Os, meters) on EWIO₂ and expansion modules
- Display of live values at the data point
- Pre-installed nodes for Modbus TCP and BACnet/IP
- Additional nodes can be installed via the Node-RED palette

Dimensional drawing

