# Data sheet

## EWIO₂-M

(M-Bus)

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**Part no.**
**110930**
**EAN 4251394613079**
2025-04-28
Version J

## Illustration



**Wiring diagram**



GND = 0 V = -(same potential)
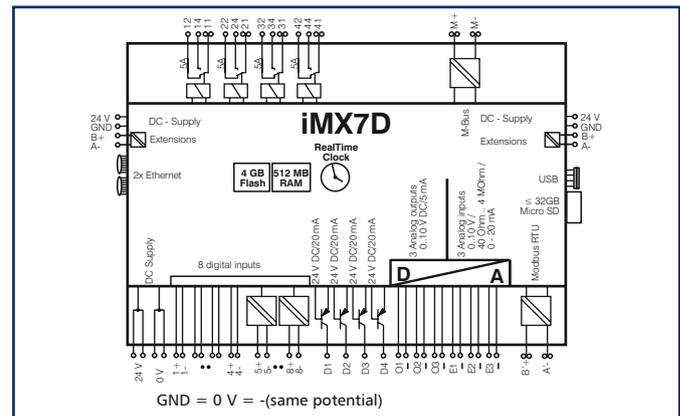
## Product specification

The EWIO₂-M 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 the LAN network. 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 (SSL). 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 µSD memory card expands the range of functions of the EWIO₂-M for save settings, data and applications.

## Application note

This product is a standard product of METZ CONNECT. METZ CONNECT is not aware of the specific intended use of the goods by the Customer or any customers of the Customer. The Customer guarantees that it has fully and sufficiently tested the use of the goods and any product modifications, product changes or product enhancements with regard to the specific intended use in accordance with the state of the art or in any other way. At METZ CONNECT's request, the Customer shall submit and make available meaningful evidence (e.g. test and laboratory protocols, certifications, etc.).

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## EWIO$_2$-M

(M-Bus)

## Technical Data

### General Features

| | |
|---|---|
| Network | 2 Port Ethernet LAN 10/100 BaseT Daisy-Chain |
| Protocol | TCP/IP |
| M-Bus | for 80 M-Bus charges |
| RJ45 jack according to | EN 60603-7-51 Ed.1 (12/2008) |
| Interfaces | |
| 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) | $\mu$SD max. 32 GB |
| Operating temperature | -5° to 55° C |
| Storage temperature | -25° to 70° C |
| Relative humidity | max. 85 % non-condensing |

### 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 mm² / AWG 22 – 12 |

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## 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<br>  Power drop bridging operation | 1 s / day<br>10 h |

### Visualization

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

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## EWIO$_2$-M

(M-Bus)

## Technical Data

| Inputs and Outputs | |
|---|---|
| **Digital inputs** | |
| 8x inputs or 8x S0 inputs of these, 4x contact inputs for potential-free switches | |
| Switching voltage<br>Switching threshold<br>Switching current<br>Metering function | 15 Volt DC ± 10 %<br>5 Volt ± 10 %<br>≥ 1 mA<br>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 ± 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<br>< 0,1 % at resistance measurement < 12 kΩ<br>< 1,0 % at resistance measurement > 12 kΩ |
| Input resistance | 1 MΩ, 2% at voltage measurement<br>200 Ω, 1% at current measurement |

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## EWIO$_2$-M
(M-Bus)

## 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 |

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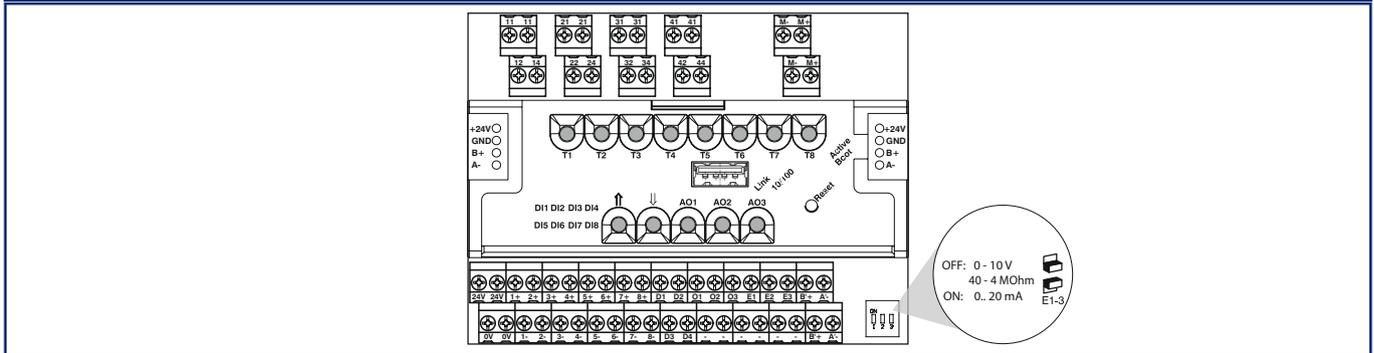| Inputs and Outputs | |
|---|---|
| **Relay outputs**<br>DPST Relay | 4x |
| Contact material | AgSnO$_2$ |
| Switching current | max. 6 A/230 V ohmic load |
| Isolation voltage | 1000 V$_{RMS}$ (open contacts)<br>4000 V$_{RMS}$ (contact - coil; >= 5.5 mm) |
| Status display for each relay | LED yellow |
| Manual control for each relay | tact |
| Switching automatic/manual operation | press tact > 1 s |
| Clearance and creepage distances<br>    relay coil -contact | >= 5.5 mm |
| **Digital outputs** | |
| 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 |
| **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 |

**METZ CONNECT GmbH** | Im Tal 2 | 78176 Blumberg | Germany
Phone +49 7702 533-0 | Fax +49 7702 533-433
Weitere Dokumentation siehe / additional documentation see /
documentation supplémentaire voir www.metz-connect.com

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(M-Bus)

## Wiring



| 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- | | DI1 \| ON (yellow) |
| | (T2) | 2+/2- | | DI2 \| ON yellow) |
| | (T3) | 3+/3- | | DI3 \| ON (yellow) |
| | (T4) | 4+/4- | | DI4 \| ON (yellow) |
| | (T5) | 5+/5- | galvanically isolated | DI5 \| ON (yellow) |
| | (T6) | 6+/6- | | DI6 \| ON (yellow) |
| | (T7) | 7+/7- | | DI7 \| ON (yellow) |
| | (T8) | 8+/8- | | DI8 \| ON (yellow) |

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## EWIO$_2$-M
(M-Bus)

## 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$_2$-M is ready | | | Active (green) |
| EWIO$_2$-M boots | | | Boot (red) |
| EWIO$_2$-M new boot procedure | Reset | | Reset (red) |

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## EWIO₂-M

(M-Bus)

## Software specifications

**Linux typical programs (embedded versions)**
**for system functions:**

| | |
|---|---|
| crond | time control |
| vsftpd | FTP, FTPS (SSL) |
| ifplugd | HotPlug |
| udhcpc | 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

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# EWIO$_2$-M

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## Software specifications

**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$_2$-M

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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## EWIO$_2$-M

(M-Bus)

## Software specifications

### Applications (shell, phyton 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$_2$-M 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$_2$ in the same network
- Connection to EWIO$_2$ (also other EWIO$_2$ 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$_2$ and expansion modules
- Display of live values at the data point
- Pre-installed nodes for M-Bus
- Additional nodes can be installed via the Node-RED palette

## Dimensional drawing