Powering Business Worldwide

EMD3P

Instruction Leaflet
Montageanweisung
Notice d'installation
Instrucciones de montaje
Istruzioni per il montaggio
安装说明
Инструкция по монтажу
Montagehandleiding
Montagevejledning
Οδηγίες εγκατάστασης
Instruções de montagem
Monteringsanvisning
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Návod k montáži
Paigaldusjuhend
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Instrukcja montażu
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Návod na montáž
Монтажни инструкции
Instrucțiuni de montaj
Upute za montažu
Montaj Talimatı
Инструкција за монтажу
Intruksjonsblad
Монтажна інструкція
نشرة التعليمات

1. Scope

This document applies to the Sensor Unit EMD3P with LAN and RS485 communication interfaces.

2. Connection and set-up

At least the line conductor L1 and neutral conductor N must be connected since it is these conductors that power the EMD3P.

⚠ DANGER

Danger of death by electric shock.

Live components carry potentially fatal voltages.

- **Before starting any installation or maintenance work, switch off the power to the distribution board and secure to prevent it being switched on again accidentally.**
- **Make sure that the conductors to be connected to the meter are voltage-free.**
- **All installation and maintenance work on this device must be carried out by a trained and authorised electrician.**

3. Intended use

The EMD3P is a measuring device that measures electrical values at the point of connection and makes them available via LAN or RS485.

This product is NOT an active electrical energy meter as defined by EU Directive 2004/22/EC (MID); it must only be used for internal accounting purposes.

The data that the EMD3P collects about the energy generated by your system may differ from the data from the main energy meter.

⚠ CAUTION

Devices which process the measured data from the EMD3P must ensure that missing or incorrect measured values from the EMD3P cannot cause a hazard.

As it is classified as overvoltage category III, the EMD3P must only be connected in the sub-distribution board or consumer unit, downstream of the electricity supply company's energy meter.

The EMD3P is suitable for indoor use only.

The EMD3P is approved for use in the EU Member States, the UK and Norway. Do not use the EMD3P if it is damaged and then use only as described in this documentation. Any other use or the use of damaged units may result in injury or damage to property.

For safety reasons, the product (including the software) must NOT be modified and components must NOT be installed that are not expressly recommended or sold by Eaton for this product. Any use of the product other than as described in the Intended use section shall be regarded as contrary to the intended use. Unauthorised changes, conversions or repairs and opening of the product are prohibited.

The enclosed documentation is part of the product and must be read, followed and then retained in a place that is accessible at all times.

4. Supported products and software versions

For information on the supported products, the individual functions of your preinstalled software and firmware updates, go to the EMD3P product page at www.eaton.com/emd3p.

5. Items supplied

EMD3P

- 1x EMD3P
- 1x installation instructions
- 4x connector
- 3x current transformer (63 A, 200 A, 600 A)

Please contact your dealer if you identify any damage or if the delivery is incomplete.

Additional materials required (not supplied):

- For the LAN connection: 1x network cable

6. Safety instructions

⚠ DANGER

Danger of death by electric shock.

Live components carry potentially fatal voltages.

- **Only use the EMD3P in a dry environment and keep it away from liquids.**
- **Install the EMD3P only in approved enclosures or distribution boards downstream of the electricity supply company's meter so that the connections for the line and neutral conductors are located behind a cover or guard to prevent accidental contact.**
- **The enclosure or distribution board must be accessible only with a key or suitable tool in order to limit access to authorised personnel.**
- **Before starting any installation or maintenance work, switch off the power to the distribution board and secure to prevent it being switched on again accidentally.**
- **Before cleaning, switch off the power to the EMD3P and only use a dry cloth to clean.**
- **Maintain the prescribed minimum distances between the network cable and mains voltage installation components or use suitable insulation.**

⚠ CAUTION

Damage to or destruction of the EMD3P by voltage surges on the data cable (Ethernet, RS485)

- If data cables are installed outside the zbuilding, the data cable and remote station (inverter, charging station, etc.) must be protected with suitable overvoltage protection.

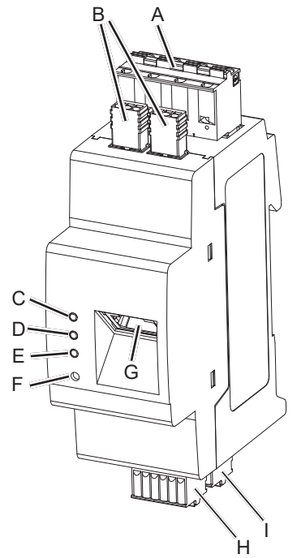
Damage to or destruction of the EMD3P by improper use

- Do not operate the EMD3P outside the specified technical tolerances.

7. Technical data

Interfaces	LAN (10/100 Mbit) RS485 (half-duplex, max. 115200 baud)
Protection class	II
Pollution degree	2
Weight	<0.1 kg
Dimensions	88x35x65 mm
Ambient temperature in operation	-25 °C…+55 °C
Ambient temperature during transportation / storage	-25 °C…+70 °C
Relative humidity (non-condensing)	Up to 75 % as an annual average, up to 95 % on up to 30 days/year
Max. altitude during operation	2000 m above sea level
Mains power supply	
Supply voltage	85 V AC…250 V AC
Frequency	50 / 60 Hz
Internal consumption P_{max}	2 W
Measuring circuit for measurement category CAT III	
Limit current I_N / phase	Max. 200 mA
Frequency range	50/60 Hz ± 5 %

8. Product description



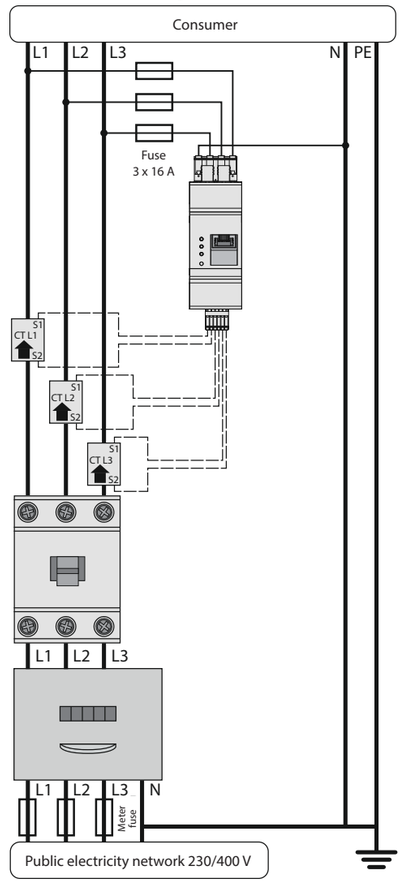
A	Voltage input L1, L2, L3, N
B	2x RS485 connection
C	Status LED
D	Network LED
E	Serial bus LED for RS485 bus
F	Button
G	LAN
H	Connection CT L1/L2/L3
I	Connection CT L1/L2/L3

9. Installation

9.1. Assembly

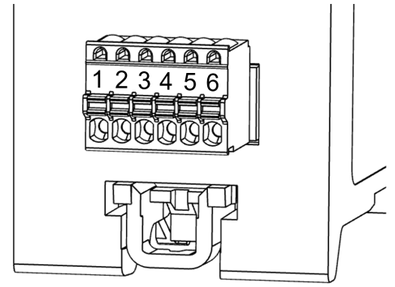
To fit the EMD3P, hook the device over the top edge of the DIN rail and press it until it clicks into place.

9.2. Connection diagram



9.3. Current inputs and transformers

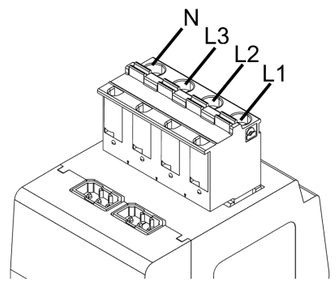
1. Only use the current transformers provided.
2. Connect the current transformer to the device first and then to the conductor.
3. Connect the current transformer cables as shown in the following connection diagram/scheme.
4. Open the current transformer for L1 in order to insert the wire, then close again until you hear it click into place. Repeat this step for all phases L2, L3. Note the direction of the arrows! See "9.2. Connection diagram".



Item	Phase	Wire
1	L1	S1 (red)
2		S2 (black)
3	L2	S1 (red)
4		S2 (black)
5	L3	S1 (red)
6		S2 (black)

9.4. Voltage inputs

1. Connect the cables L1, L2, L3, N to the EMD3P.
2. Permitted cable cross-sections: 0.20 … 2.50 mm²



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Designation	Explanation
L1, L2, L3	Line conductor
N	Neutral conductor

The end user must be able to isolate the EMD3P from the power supply by means of a freely accessible meter fuse or an additional circuit-breaker.

⚠CAUTION

Check correct assignment of the phases

- Make sure that the phases are all correctly allocated, otherwise the EMD3P will return incorrect measured values.
- The voltage inputs of the EMD3P [L1, L2, L3] must be protected with 16 A type B fuses.

9.5. RS485 interface

The EMD3P has an RS485 interface; its two connections allow it to be daisy-chained to other devices.

Note the following points when connecting external devices to the RS485 interface of the EMD3P:

Requirement for the cable:

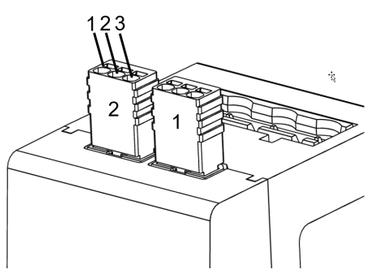
- Nominal voltage/wire insulation: 300 V RMS
- Cable cross section: 0.20 ... 0.50 mm²
- Max. cable length: 100 m
- Cable type: Rigid or flexible
- Recommendation: use standard cable, e.g. AlphaWire, designation 2466C. Alternatively, a CAT5e cable can also be used.

Requirement for cable installation:

- In the area for connecting the RS485 interface on the EMD3P, mechanical means must be provided to ensure that individual wires of the connecting cable are at least 10 mm away from live parts.
- The connecting cable must be run separately from the mains cables in the distribution board and on the permanent link.

Requirements for the remote station:

- The RS485 interface of the connected device must meet the safety extra low voltage requirements.



Connection diagram for RS485 connector:

Pin	Identification	Description
1	B	RS485 B
2	A	RS485 A
3	GND	Ground

10. LED statuses

LED statuses	
○	Off
☼	Flashing slowly
☼	Flashing rapidly
●	Permanently on

Status LED	
●	Device ready-to-operate
☼	Device in update mode with active web interface
2x	Confirmation for reset to factory default settings, see section "12.1. Restore the EMD3P factory settings"
●	Error - see section "13. Fault finding"
☼	Firmware update in progress, see section "12.3. Firmware update"

Network LED	
○	No connection
●	Ethernet link active
☼	Communication running
●	Communication error

Serial bus LED	
○	No connection
☼	Communication running
●	Communication error

11. Set-up

11.1. Set-up

1. Install the EMD3P as described in section "9. Installation".
2. Attach the cover or the contact guard of the sub-distribution board to the EMD3P.
3. Restore the power to the sub-distribution board.
4. When the set-up is complete, the status LED lights up green and stays on.

11.2. LAN connection

1. Connect the network cable to the network connection of the EMD3P.
2. Connect the other end of the network cable to a router/switch or directly to the PC/laptop.
3. When the connection is successful and the remote station is active, the network LED lights up green.

11.3. RS485 connection

1. Connect the RS485 interface as described in section "9.5. RS485 interface".
2. When the connection is successful and the remote station is active, the serial bus LED lights up green.

12. Operation

12.1. Restore the EMD3P factory settings

Use a pointed object to press the button as follows:

- 1x short (0.5 second)
- Then, within 1 second, 1x long (between 3 seconds and 5 seconds)
- If this is done successfully, the status LED flashes orange twice

12.2. Restart the EMD3P

Use a pointed object to press the button for at least 6 seconds.

12.3. Firmware update

To activate the website for the firmware update, hold down the button until the status LED flashes green.

You can then open the website in your browser.

13. Fault finding

13.1. The status LED does not light up.

The EMD3P is not being supplied with power.

- Make sure that at least the line conductor L1 and the neutral conductor N are connected to the EMD3P.

13.2. The status LED lights up red permanently.

An error has occurred.

- Restart the EMD3P (see section "12.2. Restart the EMD3P").
- Please contact your service engineer or installation engineer.

13.3. The network LED does not light up or the EMD3P is not found on the network.

The network cable is not plugged into the network connection correctly.

- Make sure that the network cable is plugged into the network connection correctly.

The EMD3P is not on the same local area network.

- Connect the EMD3P to the same router/switch.

13.4. The EMD3P returns unrealistic measured values.

Check the following points:

- Voltages connected at L1, L2, L3, N.
- Assignment of current transformers to the phases: does CT L1 also measure current for phase L1?
- Current transformer connected in correct direction. See section "9.2. Connection diagram".
- Check whether the current transformers are correctly configured via Modbus.

14. Environmentally-friendly disposal

Dispose of the EMD3P in accordance with the electronic waste disposal regulations that apply on site.

15. Contact

If you have technical problems, please contact your service engineer or installation engineer.

16. EULA & license conditions

The End User Licence Agreement and the licence conditions can be found at www.eaton.com/emd3p.

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