



EE AC MID Energy Meters

User manual

User manual

EE AC MID Energy Meters

UM EN MM-EE-EEM-EMxxx, Revision 04

2026-07-09

This user manual is valid for:

Designation	Item No.
MM-EE-EEM-EM357	1744495
MM-EE-EEM-EM377	1684491

NCK240025_en_04

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1 For your safety

Read this manual carefully and keep it for future reference.

1.1 Identification of warning notes



This symbol indicates hazards that could lead to personal injury.

There are three signal words indicating the severity of a potential injury.

DANGER

Indicates a hazard with a high risk level. If this hazardous situation is not avoided, it will result in death or serious injury.

WARNING

Indicates a hazard with a medium risk level. If this hazardous situation is not avoided, it could result in death or serious injury.

CAUTION

Indicates a hazard with a low risk level. If this hazardous situation is not avoided, it could result in minor or moderate injury.



This symbol together with the **NOTE** signal word warns the reader of actions that might cause property damage or a malfunction.



Here you will find additional information or detailed sources of information.

1.2 Qualification of users

The use of products described in this manual is oriented exclusively to:

- Electrically skilled persons or persons instructed by them. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.
- Qualified application programmers and software engineers. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.

1.3 Field of application of the product

1.3.1 Intended use

MID energy meters may only be used to measure electric characteristic values in applications that meet the specified technical data.

1.3.2 Foreseeable misuse

MID energy meters with direct measurement are not suitable for use with voltage transformers or current transformers.

1.3.3 Product changes

Modifications to hardware and software of the device are not permitted.

Incorrect operation or modifications to the device can endanger your safety or damage the device. Do not repair the device yourself. If the device is defective, please contact Phoenix Contact.

1.4 Safety notes



**The "exclamation mark" on the device labeling means that you need to:
Read the installation note in its entirety. Follow the installation note to
avoid impairing the intended protection.**

- The installation, operation, and maintenance work must be completed by a qualified electrician. Follow the installation instructions as described.
- When installing and operating the device, the applicable regulations and safety directives (including national safety directives), as well as general technical regulations must be observed.
- Use an appropriate voltage measuring device to ensure that no voltage is present.
- Install the device in accordance with instructions described in the installation notes. Accessing circuits within the device is prohibited.
- Repairs may only be carried out by the manufacturer.
- Only clean the device with a suitable damp cloth. Switch the device off before cleaning and do not use abrasive agents or solvents.
- Ensure that all connection terminals are connected correctly to prevent the device from being damaged.
- Observe the maximum permissible voltages (480 V AC phase/phase or 276V AC phase/neutral conductor) and network frequency (50/60 Hz).
- Ensure that the communication shield must be fitted before power on! (applies only to 1744495 MM-EE-EEM-EM357)

**COMMUNICATION SHIELD
MUST BE FITTED**

2 Device description

The energy meters for current, voltage, power, and energy values record electric characteristic values. The devices have an interface for the bus or network connection.

The buttons on the front of the devices are used for data control and programming.

The backlit LCD display shows the electric characteristic values or the configuration parameters available via the display pages. Other configuration parameters can be configured via the communication interface.

The energy meters support single-phase two-wire (1P2W), three-phase three-wire (3P3W), and three-phase four-wire (3P4W) applications and are available as direct measurement.

The energy values provided by the energy meters can be used for billing purposes. All devices have MID approval in accordance with the European Measuring Instruments Directive 2014/32/EU (MID).

Communication is via the bus or network connection (Modbus/RTU or Modbus/TCP).

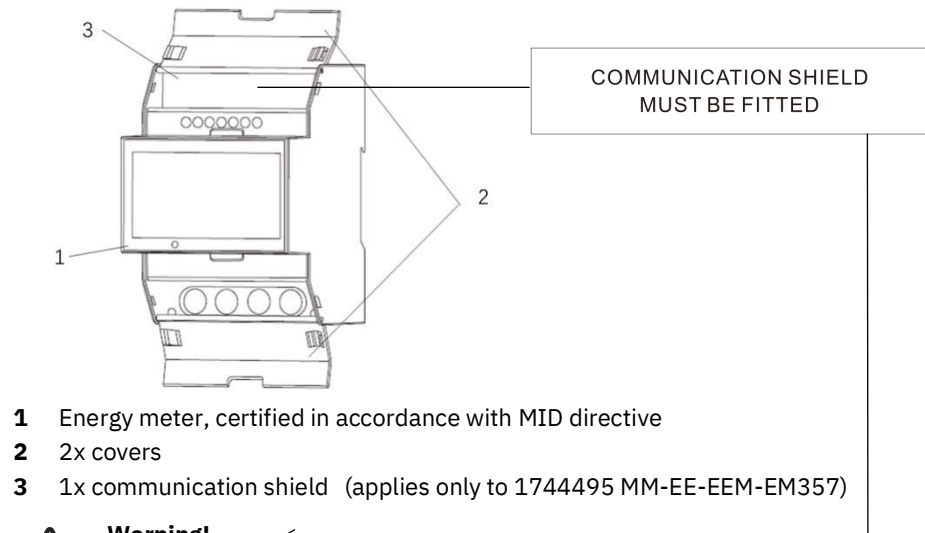
The communication interfaces are integrated in the device.

Table 2-1 Overview of main features

Characteristics	MM-EE-EEM-EM357 1744495	MM-EE-EEM-EM377 1684491
Measurement method	Direct measurement (100 A AC)	
Compliance	MID-compliant	
Communication protocol	Modbus/RTU	Modbus/TCP
Communication interface	RS-485	Ethernet (RJ45)

2.1 Scope of supply

Figure 2-1 Scope of supply



Warning!

Communication shield must be fitted before power on!

After connecting the load side (L1,L2;L3,N), the existing insulation "COMMUNI-CATION SHIELD" (see picture) must be inserted before the communication line (RS-485) connection.

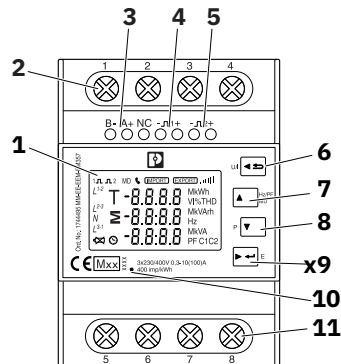
After closing and sealing the cover flaps, the device may be put into operation!

NOTE:

If the communication line touches the load line, this can lead to high voltage ingress and damage to the device.

2.2 Operating and indication elements

Figure 2-2 Operating and indication elements



- 1** LCD display
- 2** Input side: L1, L2, L3, Neutral conductor (RJ45 in EM377)
- 3** Modbus interface (applies only to 1744495 MM-EE-EEM-EM357)
- 4** Pulse output 1 (applies only to 1744495 MM-EE-EEM-EM357)
- 5** Pulse output 2 (applies only to 1744495 MM-EE-EEM-EM357)
- 6** U/I, Left/ESC key
- 7** Hz/PF MD, Up key
- 8** P, Down key
- 9** E, Right/Enter key
- 10** Pulse LED
- 11** Output side: L1, L2, L3, Neutral conductor

2.3 MID conformity

- MID conformity refers to compliance with Directive 2014/32/EU.
- In terms of MID conformity, only Total import active energy and Total export active energy are calibrated.
- The device has additional functions and measured values that are informative but not relevant with regard to MID compliance.
- The product label on the side of the device seals the device in accordance with MID compliance. If the product label is broken, compliance and warranty are invalidated.
- After installation and commissioning, the covers with sealing must be applied. (see [Section 4.4, “Sealing”](#)).

3 Quick start guide

After the voltage is applied, the device enters start mode. It will do self-test and then display device information.

Following start mode, the device automatically switches to operating mode default display energy values.

Table 3-1 Navigation

U/I, Left/ESC key	– In operating mode: Scroll through the displayed pages – In setting mode: Back to previous level
Hz/PF MD, Up key	– In operating mode: Scroll through the displayed pages – In setting mode: Move to previous setting menu item Change setting value
P, Down key	– In operating mode: Scroll through the displayed pages – In setting mode: Move to next setting menu item Change setting value
E, Right/Enter key	– In operating mode: Scroll through the displayed pages Enter setting mode: long press * – In setting mode: Save setting value Enter edit mode: long press * Save setting menu item: long press *

* Long press means to keep pressing the key for at least 3 seconds.



In the default settings, the password for the configuration is set to 1000.

Configuring parameters

Parameters are configured in setting mode, see [Section 5.1, “Setting mode”](#).

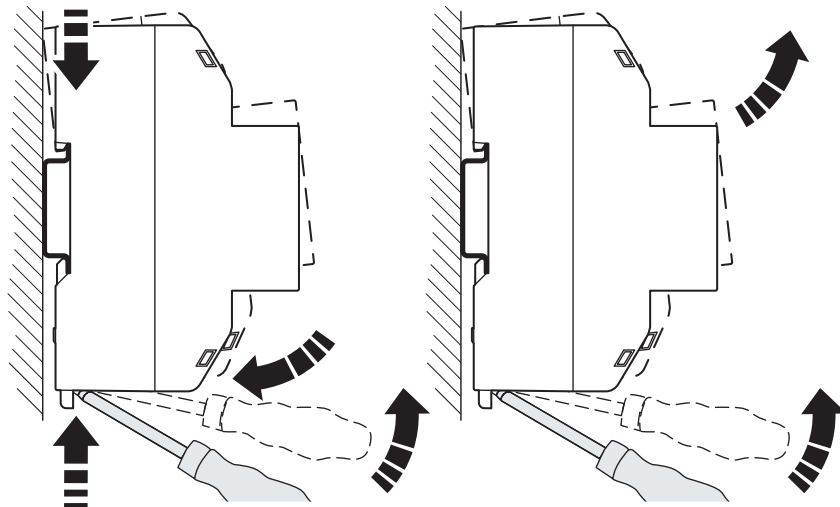
- 1 Press Right/Enter key for at least 3 seconds to enter setting mode.
- 2 The PASS display page appears.
- 3 Enter the password.
- 4 Confirm the fourth digit with keeping pressing Right/Enter key for at least 3 seconds.
The device checks the password.
Setting mode is opened if the password is right.
- 5 Configure the parameters, see [Section 5.3, “Parameters in setting mode”](#).

4 Mounting and installation

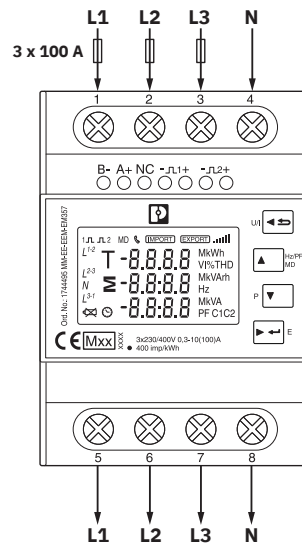
4.1 Snapping the device onto the DIN rail

The device is snapped onto a DIN rail in the control cabinet. The measuring position can be freely selected, but will be determined by the readability of the LCD.

Figure 4-1 Snapping the device onto the DIN rail



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Input side: 1,2,3,4 (L1,L2,L3,Neutral conductor)
Output side:5,6,7,8(L1,L2,L3,Neutral conductor)



3x100A

Diagram showing the connection of the meter to a three-phase system (L1, L2, L3). The meter has terminals 1 through 8. The connections are as follows:

- L1 is connected to terminal 1.
- L3 is connected to terminal 3.
- L2 is connected to terminal 8.

The meter display shows the following readings:

- UI: $\rightarrow$
- UI: $\triangle$ HZPF MD
- P: ∇
- UI: $\leftarrow$ E

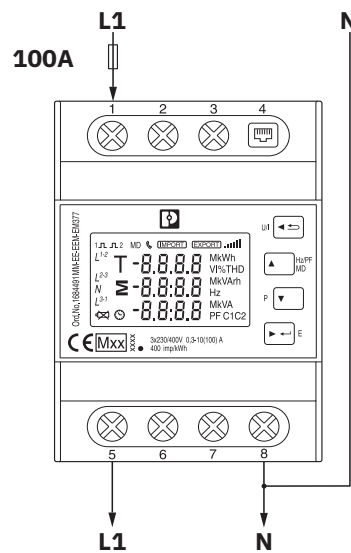
The meter display also shows the following readings:

- UI: $\rightarrow$
- UI: $\triangle$ HZPF MD
- P: ∇
- UI: $\leftarrow$ E

The meter display also shows the following readings:

- UI: $\rightarrow$
- UI: $\triangle$ HZPF MD
- P: ∇
- UI: $\leftarrow$ E

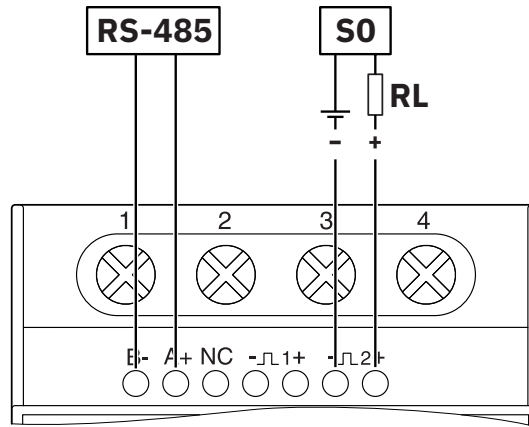
Figure 4-7 Connection 1P2W



Output side:5,6,7,8(L1,L2,L3,Neutral conductor)

4.3 Modbus/RTU installation

Figure 4-8 Connection assignment of Modbus/RTU



RS-485: B-, A+



For reliable data transmission, use a shielded cable with twisted-pair conductors.

(e.g., 2744830 FL CAT5 FLEX installation cable).

4.4 Sealing

1. Insert the upper cover (A).
2. Insert the seal cord through the front hole on the cover (B).
3. Guide the cord through the side hole on the device (C).
4. Tighten the cord so that the seal is located directly on the upper cover.
5. Repeat these steps for the other side of the upper cover and lower cover.

Figure 4-9 Sealing



5 Configuration

This section describes how you can access the relevant setting mode and configure the parameters, e.g. the parameters of the integrated communication interface.

5.1 Opening setting mode

- 1 Press Right/Enter key for at least 3 seconds to enter setting mode. Then the PASS display page appears.
- 2 Enter the password.
- 3 Press Right/Enter key for at least 3 seconds to confirm.
The device checks the password.
If entered password is correct, setting mode is opened.
If entered password is wrong, the display page will show PASS Err.



In the default settings, the password for the configuration is set to 1000.

5.2 Setting mode

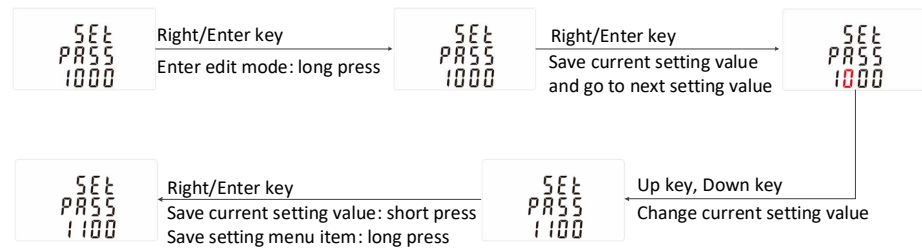
To scroll through setting menu items:

- 1 Press Up and Down key.

To change the displayed value:

- 1 Keep pressing Right/Enter key for at least 3 seconds to enter edit mode.
The value flashes.
- 2 Press Up and Down key to change setting value.
- 3 Press Right/Enter key to save current setting value of current setting menu item.
The current setting value is saved and next setting value flashes automatically.
- 4 Keep pressing Right/Enter key for at least 3 seconds to save all settings of current setting menu item.
It exits edit mode and no value flashes.

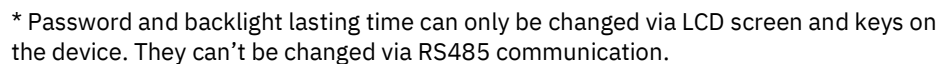
Figure 5-1 To change the displayed value



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To scroll through setting menu items or change displayed values, see [Section 5.1, “Setting mode”](#).

Figure 5-2 Setting mode



To leave setting mode, press Left/ESC key to back to previous level.

If there is no operation in setting mode for more than 60 seconds, it will back to operating mode default display automatically.

6 Operation

6.1 Start mode

After the voltage is applied, the device enters start mode. It will do self-test and then display device information.

Figure 6-1 Full screen



Table 6-1 Display pages: Start mode

Menu item	Example	Description
Display segments	Figure 6-1	All display segments
SOft	01.04	Software version information (subject to in kind)

6.2 Operating mode

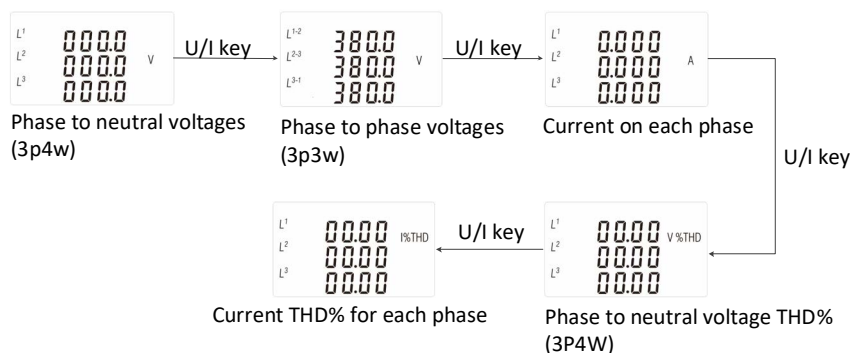
Following start mode, the device automatically switches to operating mode default display energy page. The following display pages are shown in operating mode.

6.2.1 U/I

Voltage and Current display pages.

To scroll through the displayed pages, press U/I key.

Figure 6-2 Voltage and Current display pages

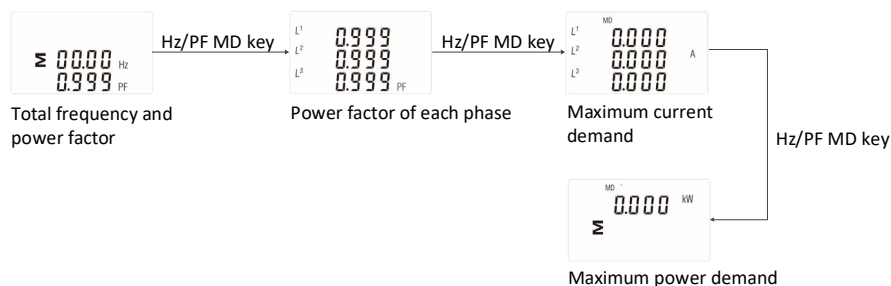


6.2.2 Hz/PF MD

Frequency, Power Factor and Maximum Demand display pages.

To scroll through the displayed pages, press Hz/PF MD key.

Figure 6-3 Frequency, Power Factor and Maximum Demand display pages

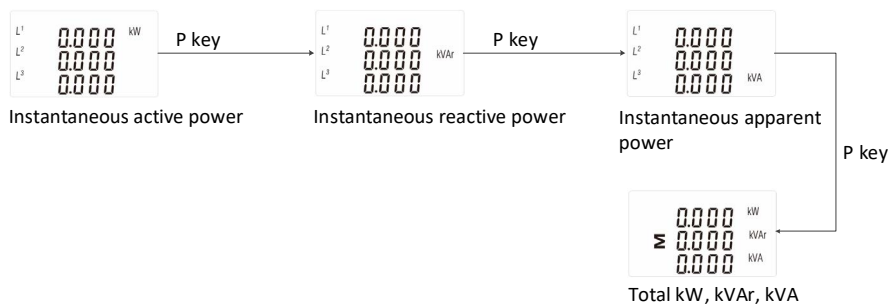


6.2.3 P

Power display pages.

To scroll through the displayed pages, press P key.

Figure 6-4 Power display pages

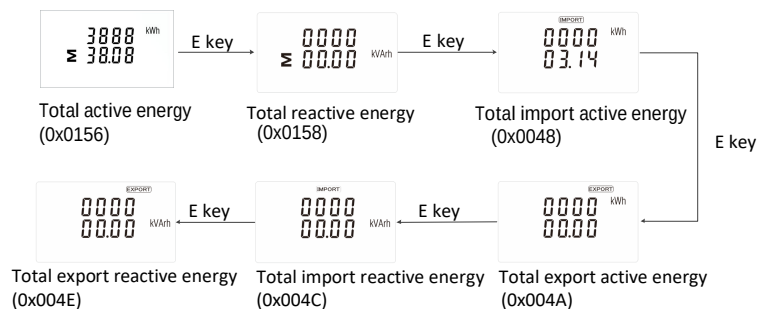


6.2.4 E

Energy display pages.

To scroll through the displayed pages, press E key.

Figure 6-5 Energy display pages



6.3 Communication

6.3.1 Modbus/RTU

The RS-485 interface is used for the local remote readout with the Modbus/RTU protocol. During this process, the measuring device is the server and the PC or controller is the client.

Connect a terminal resistance ($R_T = 120\ \Omega$) at the start and end of the network.

The maximum number of devices is 32 per bus. The recommended maximum length is ≤ 1000 m. You can use signal amplifiers for transmission.

Please note that the maximum number of meters depends on the converter and the set baud rate. The higher the baud rate, the smaller the number of meters that can be used.

Table 6-2 Setting range and default of Modbus RTU communication

Parameters	Setting range	Default settings
Address	1...247	1
Baud rate	2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps	9600 bps
Parity	None, even, odd	None
Stop bit	1, 2	1

6.3.2 Modbus/TCP

The Ethernet interface is used for device management within the Ethernet network and communicates via the Modbus/TCP protocol.

The device is factory set to static IP configuration by default, with parameters as follows:

Table 6-3 Setting range and default of Modbus TCP communication

Parameters	Default settings
Modbus address	1...247 (default 1)
IP address	192.168.1.200
Subnet mask	255.255.255.0
Default gateway	192.168.1.1
DHCP	Off
IP port	502

6.4 Outputs

The device provides two pulse outputs. Both pulse outputs are passive type.

Pulse output 1 is configurable. The pulse output 1 can be set to generate pulses to represent total / import / export kWh or kVAh.

The pulse constant can be set to generate 1 pulse per:

$dF_t = 0.0025 \text{ kWh/imp (default)}$

0.01 = 0.01 kWh/imp or kVAh/imp

0.1 = 0.1 kWh/imp or kVAh/imp

1 = 1 kWh/imp or kVAh/imp

10 = 10 kWh/imp or kVAh/imp

100 = 100 kWh/imp or kVAh/imp

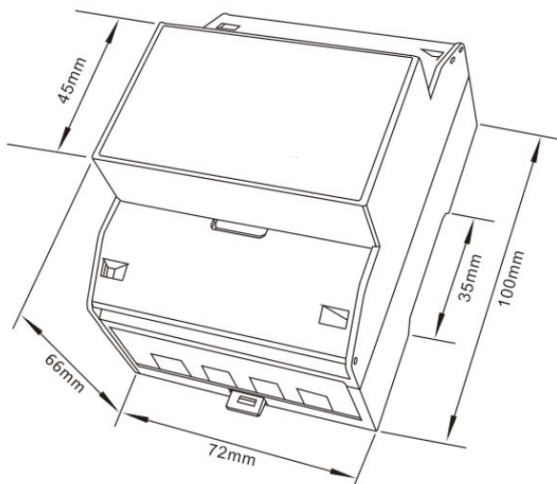
Pulse width: 200/100(default)/60ms

Pulse output 2 is non-configurable. It is fixed at total kWh. The constant is 400imp/kWh. Its width is fixed at 100ms.

7 Technical data

7.1 Dimensions

Figure 7-1 Dimensions



7.2 Technical data

Measuring input data	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Nominal Voltage U_N	3x230/400 V AC	
Input voltage range	173...480 V AC (Ph/Ph) 100...277 V AC (Ph/N)	
Consumption	< 10 VA (2 W)	
Frequency	50 Hz /60 Hz	
Supply voltage	Supply from the measuring circuit	
Starting current I_{st}	0.04 A	
Minimum current I_{min}	0.3 A	
Transient current I_{tr}	1 A	
Nominal current I_{ref}	10 A	
Maximum current I_{max}	100 A	
Overload capacity	30 x I_{max} for 0.01 s	
Mete type	Bidirectional meter	
Communication	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Communication Standard	RS-485	Ethernet
Communication Protocol	Modbus/RTU	Modbus/TCP
Transmission speed range	2400...38400 bps	100 Mbps
Parity	Odd, Even, None	-
Stop bit	1 or 2	-
Modbus address	1 ... 247	1 ... 247
IP address	-	192.168.1.200
Subnet mask	-	255.255.255.0
Gateway	-	192.168.1.1
DHCP	-	Off
IP port	-	502
Pulse Outputs	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Pulse output 1		-
Meter constant	Configurable	-
Pulse width	Configurable	-
Pulse output 2		-
Meter constant	400 imp/kWh	-
Pulse width	100 ms	-
Description of the output	Passive opto-isolated	-
Maximum switching voltage	27 V DC	-
Maximum switching current	27 mA	-

Product designation

Metrological LED	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Meter constant	400 imp/kWh	
Measurement connection	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Connection method	Screw connection	
Conductor cross-section (rigid /flexible/AWG)	1.5 ... 25 mm ² / 11 ... 4 AWG	
Tightening torque	3.5 Nm	
Stripping length	12 ... 13 mm	
Other connections (RS-485/pulse output)	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Connection method	Screw connection	-
Conductor cross-section (rigid /flexible/AWG)	0.5 ... 1.5 mm ² / 26 ... 14 AWG	-
Tightening torque	0.2 Nm	-
Stripping length	6 ... 7 mm	-
Accuracy	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Active energy (EN 50470-3)	Class B	
Active energy (IEC 62053-21)	Class 1	
Reactive energy (IEC 62053-21)	Class 2	
Ambient conditions	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Ambient temperature (operation)	-40 °C ... +70 °C / -40 °F... +158 °F	
Ambient temperature (storage)	-40 °C ... +70 °C / -40 °F... +158 °F	
Humidity (operation)	0 ... 90% (non-condensing)	
Altitude	≤2000 m	
Electromagnetic compatibility (EMC)	E2	
Mechanical properties	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Mechanical environment	M1	
Degree of protection	IP51 (front) IP20 (connections)	
Housing standard	DIN 43880	
Flammability rating	UL94 V0	
Electrical safety	MM-EE-EEM-EM357	MM-EE-EEM-EM377
Pollution degree	2	
Protection class	II	
Measuring category	CAT III 300 V	
Impulse voltage rating	6 kV (1.2/50 μs)	
AC voltage rating	4 kV	

7.3 MID data

MID data	
Accuracy	Class B (EN 50470-3)
Voltage U_N	3 x 230 / 400 V
Rated frequency f_N	50 Hz / 60 Hz
Cosine φ	0.5 inductive...0.8 capacitive
Starting current I_{st}	0.04 A
Minimum current I_{min}	0.3 A
Transient current I_{tr}	1 A
Nominal current I_{ref}	10 A
Maximum current I_{max}	100 A
Operation temperature	-40 ... +70 °C / -40 ... +158 °F
Relative humidity	≤90%, non-condensing
Electromagnetic ambient conditions	E2
Mechanical ambient conditions	M1
Type of application	Interior space counter
Protection class	To ensure that protection against dust and water is provided in accordance with the specific standards as per MID, the energy meter must be installed in a housing or control cabinet with protection class IP51 (or higher).

8 Modbus register

Table 8-1 The format for each byte in RTU mode

Coding system:	8-bit per byte
Data format:	4 bytes (2 registers) per parameter except "reset" Floating point format (to IEEE 754) if there is no special note. Most significant register first (Default). The default may be changed if required
Error Check Field:	2 byte Cyclical Redundancy Check (CRC)
Framing:	1 start bit 8 data bits, least significant bit sent first 1 bit for even/odd parity (or no parity) 1 stop bit if parity is used, 1 or 2 bits if no parity

The device can transfer a maximum of 50 values in a single transaction. Therefore, the maximum number of registers requestable is 100. Exceeding this limit will prompt the device to generate an exception response.

8.1 Measuring values

Table 8-2 Measuring values³

Decimal start address	Hexadecimal start address	Type	Functions	Format
30001	0x0000	Read	04	Float

Decimal address	Hexadecimal address	Number of registers	Description	Unit	3P4W	3P3W	1P2W
30001	0x0000	2	Phase voltage L1	V	x	-	x
30003	0x0002	2	Phase voltage L2	V	x	-	-
30005	0x0004	2	Phase voltage L3	V	x	-	-
30007	0x0006	2	Current I1	A	x	x	x
30009	0x0008	2	Current I2	A	x	x	-
30011	0x000A	2	Current I3	A	x	x	-
30013	0x000C	2	Active power phase 1	W	x	-	x
30015	0x000E	2	Active power phase 2	W	x	-	x
30017	0x0010	2	Active power phase 3	W	x	-	-
30019	0x0012	2	Apparent power phase 1	VA	x	-	x
30021	0x0014	2	Apparent power phase 2	VA	x	-	-

30023	0x0016	2	Apparent power phase 3	VA	x	-	-
30025	0x0018	2	Reactive power phase 1	VAr	x	-	x
30027	0x001A	2	Reactive power phase 2	VAr	x	-	-
30029	0x001C	2	Reactive power phase 3	VAr	x	-	-
30031	0x001E	2	Power factor ^{*1} phase 1	None	x	-	x
30033	0x0020	2	Power factor ^{*1} phase 2	None	x	-	-
30035	0x0022	2	Power factor ^{*1} phase 3	None	x	-	-
30037	0x0024	2	Phase 1 phase angle	Degrees	x	-	x
30039	0x0026	2	Phase 2 phase angle	Degrees	x	-	-
30041	0x0028	2	Phase 3 phase angle	Degrees	x	-	-
30043	0x002A	2	Average phase voltage	V	x	-	-
30047	0x002E	2	Average current	A	x	x	x
30049	0x0030	2	Sum of currents	A	x	x	x
30053	0x0034	2	Total active power	W	x	x	x
30057	0x0038	2	Total apparent power	VA	x	x	x
30061	0x003C	2	Total reactive power	VAr	x	x	x
30063	0x003E	2	Total system power factor ^{*1}	None	x	x	x
30067	0x0042	2	Total phase angle	Degrees	x	x	x
30071	0x0046	2	Frequency of supply	Hz	x	x	x
30073	0x0048	2	Total import active energy	kWh	x	x	x
30075	0x004A	2	Total export active energy	kWh	x	x	x
30077	0x004C	2	Total import reactive energy	kVArh	x	x	x
30079	0x004E	2	Total export reactive energy	kVArh	x	x	x
30081	0x0050	2	Total apparent energy	kVAh	x	x	x
30083	0x0052	2	Ah since last reset	Ah	x	x	x
30085	0x0054	2	Total active power demand ^{*2}	W	x	x	x
30087	0x0056	2	Max. total active power demand ^{*2}	W	x	x	x
30101	0x0064	2	Total apparent power demand	VA	x	x	x
30103	0x0066	2	Max. total apparent power demand	VA	x	x	x
30105	0x0068	2	Neutral current demand	A	x	-	-
30107	0x006A	2	Max. neutral current demand	A	x	-	-
30109	0x006C	2	Total reactive power demand ^{*2}	VAr	x	x	x
30111	0x006E	2	Max. total reactive power demand ^{*2}	VAr	x	x	x

Product designation

30201	0x00C8	2	Phase conductor voltage L1-2	V	x	x	-
30203	0x00CA	2	Phase conductor voltage L2-3	V	x	x	-
30205	0x00CC	2	Phase conductor voltage L3-1	V	x	x	-
30207	0x00CE	2	Average phase conductor voltage	V	x	x	-
30225	0x00E0	2	Neutral current	A	x	-	-
30235	0x00EA	2	THD phase voltage L1	%	x	-	x
30237	0x00EC	2	THD phase voltage L2	%	x	-	-
30239	0x00EE	2	THD phase voltage L3	%	x	-	-
30241	0x00F0	2	THD Current I1	%	x	x	x
30243	0x00F2	2	THD Current I2	%	x	x	-
30245	0x00F4	2	THD Current I3	%	x	x	-
30249	0x00F8	2	THD AVG phase voltage	%	x	-	x
30251	0x00FA	2	THD AVG current	%	x	x	x
30259	0x0102	2	Current I1 demand	A	x	x	x
30261	0x0104	2	Current I2 demand	A	x	x	-
30263	0x0106	2	Current I3 demand	A	x	x	-
30265	0x0108	2	Max. current I1 demand	A	x	x	x
30267	0x010A	2	Max. current I2 demand	A	x	x	-
30269	0x010C	2	Max. current I3 demand	A	x	x	-
30335	0x014E	2	THD phase conductor voltage L1-2	%	x	x	-
30337	0x0150	2	THD phase conductor voltage L2-3	%	x	x	-
30339	0x0152	2	THD phase conductor voltage L3-1	%	x	x	-
30341	0x0154	2	THD AVG phase conductor voltage	%	x	x	-
30343	0x0156	2	Total active energy ^{*3}	kWh	x	x	x
30345	0x0158	2	Total reactive energy ^{*3}	kVArh	x	x	x
30347	0x015a	2	Import active energy phase 1	kWh	x	x	x
30349	0x015c	2	Import active energy phase 2	kWh	x	x	x
30351	0x015e	2	Import active energy phase 3	kWh	x	x	x
30353	0x0160	2	Export active energy phase 1	kWh	x	x	x
30355	0x0162	2	Export active energy phase 2	kWh	x	x	x
30357	0x0164	2	Export active energy phase 3	kWh	x	x	x
30359	0x0166	2	Total active energy phase 1 ^{*3}	kWh	x	x	x
30361	0x0168	2	Total active energy phase 2 ^{*3}	kWh	x	x	x

30363	0x016a	2	Total active energy phase 3 ^{*3}	kWh	x	x	x
30365	0x016c	2	Import reactive energy phase 1	kVArh	x	x	x
30367	0x016e	2	Import reactive energy phase 2	kVArh	x	x	x
30369	0x0170	2	Import reactive energy phase 3	kVArh	x	x	x
30371	0x0172	2	Export reactive energy phase 1	kVArh	x	x	x
30373	0x0174	2	Export reactive energy phase 2	kVArh	x	x	x
30375	0x0176	2	Export reactive energy phase 3	kVArh	x	x	x
30377	0x0178	2	Total reactive energy phase 1 ^{*3}	kVArh	x	x	x
30379	0x017a	2	Total reactive energy phase 2 ^{*3}	kVArh	x	x	x
30381	0x017c	2	Total reactive energy phase 3 ^{*3}	kVArh	x	x	x
320131	0x4EA2	2	Carbon emission (CO ₂)	kg	x	x	x

Notes:

*1. The power factor has its sign adjusted to indicate the direction of the current. Positive refers to forward current, negative refers to reverse current.

*2. The total active power demand calculation is for Import – Export.

*3. The total active energy / reactive energy equals to Import + Export.

8.2 Device information and configuration

Table 8-3 Device information and configuration

Decimal start address	Hexadecimal start address	Functions
40003	0x0002	03/10

Decimal address	Hexadecimal address	Number of registers	Description	Type	Data type
40003	0x0002	2	Demand period 0, 5, 8, 10, 15, 20, 30, 60 mins Default 60 mins	r/w	Float
40011	0x000A	2	Grid type 1=1P2W 2=3P3W 3=3P4W Default 3 Note: Need to unlock password protection	r/w	Float
40013	0x000C	2	Pulse 1 width 60, 100, 200 ms Default 100 ms	r/w	Float

Product designation

40015	0x000E	2	Write the current password to unlock protected registers. 0=locked 1=unlocked If there is no operation for 1 minute after password is unlocked, the password will be locked again.	ro	Float
40019	0x0012	2	Stop bits/parity for Modbus 0=1 stop bit, no parity 1=1 stop bit and even parity 2=1 stop bit and odd parity 3=2 stop bits an no parity Default 0	r/w	Float
40021	0x0014	2	Modbus address range 1...247 Default 1	r/w	Float
40023	0x0016	2	Pulse 1 configuration 0=0.0025 kWh (kVArh)/imp 1=0.01 kWh (kVArh)/imp 2=0.1 kWh (kVArh)/imp 3=1kWh (kVArh)/imp 4=10 kWh (kVArh)/imp 5=100 kWh (kVArh)/imp Default 0	r/w	Float
40025	0x0018	2	Change Password 0000...9999 Default 1000	r/w	Float
40029	0x001C	2	Baud rate 0=2400 bps 1=4800 bps 2=9600 bps 3=19200 bps 4=38400 bps Default 2	r/w	Float

40061	0x003C	2	Backlight Range: 0...121 minutes 0 = backlight is always on 121 = backlight is always off Default: 0	r/w	Float
40071	0x0046	2	Carbon emission/kWh 00.0000 ... 60.0000 kg Example: 0x01 represents 0.0001 Default: 0.5703 (0x00001647) Note: Need to unlock password protection	r/w	Hex
40087	0x0056	2	Energy Type of pulse output 1 1: import active energy 2: total active energy 4: export active energy 5: import reactive energy 6: total reactive energy 8: export reactive energy Default 6	r/w	Float
461447	0xF006	7	Ethernet communication parameters: IP address (4 bytes), Subnet mask (4 bytes), Gate way (4 bytes), IP port (2 bytes). Default: IP address = 192.168.1.200 Subnet mask = 255.255.255.0 Gate way = 192.168.1.1 IP port = 502 Note: If the automatic IP address acquisition function is enabled, the register cannot be set and can only be read	r/w	Hex

Product designation

461455	0xF00E	2	The function setting registers for automatically obtaining IP addresses (DHCP) 00 00 = Turn off automatic IP address acquisition function 00 01 = Open automatic IP address acquisition function Note: Need to unlock password protection	r/w	Hex
461457	0xF010	1	Reset 00 00: reset the maximum demand	wo	Hex
464513	0xFC00	2	Serial number	ro	UInt32

For example:

1 Read Input Registers — “Total active energy”

Request: 01 04 01 56 00 02 90 27

01 = Meter address

04 = Function code

01 = High byte of register hexadecimal address

56 = Low byte of register hexadecimal address

00 = High byte of register number

02 = Low byte of register number

90 = Low byte of CRC

27 = High byte of CRC

Response: 01 04 04 42 18 51 EC 53 E6

01 = Meter address

04 = Function code

04 = Byte number

42 = Data: High word – high byte

18 = Data: High word – low byte

51 = Data: Low word – high byte

EC = Data: Low word – Low byte

53 = Low byte of CRC

E6 = High byte of CRC

Comment:

- Data (421851EC) is big-endian, convert per IEEE754 single-precision standard.
- 421851EC (Hexadecimal) = 38.08 (Float value)

2 Read Holding Registers — “Grid type”

Request: 01 03 00 0A 00 02 E4 09

01 = Meter address

03 = Function code

00 = High byte of register hexadecimal address

0A = Low byte of register hexadecimal address

00 = High byte of register number

02 = Low byte of register number

E4 = Low byte of CRC

09 = High byte of CRC

Response: 01 03 04 40 40 00 00 EE 27

01 = Meter address

03 = Function code

04 = Byte number

40 = Data: High word – high byte

40 = Data: High word – low byte

00 = Data: Low word – high byte

00 = Data: Low word – Low byte

EE = Low byte of CRC

27 = High byte of CRC

Comment:

- Data (40400000) is big-endian, convert per IEEE754 single-precision standard
- 40400000 (Hexadecimal) = 3 (Float value), which corresponds to 3P4W

3 Write Holding Registers — “Pulse 1 configuration = 0.01 kWh/imp”

Request: 01 10 00 16 00 02 04 3F 80 00 00 7F 75

01 = Meter address

10 = Function code

00 = High byte of register hexadecimal address

16 = Low byte of register hexadecimal address

00 = High byte of register number

02 = Low byte of register number

04 = Byte number

3F = Data: High word – high byte

80 = Data: High word – low byte

00 = Data: Low word – high byte

00 = Data: Low word – Low byte

7F = Low byte of CRC

75 = High byte of CRC

Comment:

- Data (3F800000) is big-endian, convert per IEEE754 single-precision standard
- 3F800000 (Hexadecimal) = 1 (Float value), which corresponds to 0.01 kWh/imp

Response: 01 10 00 16 00 02 A0 0C

01 = Meter address

10 = Function code

00 = High byte of register hexadecimal address

16 = Low byte of register hexadecimal address

00 = High byte of register number

02 = Low byte of register number

A0 = Low byte of CRC

0C = High byte of CRC

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