OB434 MODBUS/M-BUS

Three phase four wire DIN Rail energy meter

- Modbus or M-bus - Optional

Four module 70mm width

MID approved

User Manual

1.1 Safety instructions

Information for Your Own Safety

This manual does not contain all the safety measures for the equipment, special operating conditions, and local regulations may necessitate further measures for your personal safety and to avoid material damages. This information is highlighted by a warning triangle and represents the degree of potential danger.

Warning

This means that failure to observe this instruction can result in death, serious injury or considerable material damage.

Caution

This means hazard of electric shock, failure to take the necessary safety precautions could result in death, serious injury or considerable material damage.

Qualified personnel

Operation of the equipment described in this manual may only be performed by qualified personnel familiar with Safety and Regulatory Electrical standards.

Use for the intended purpose

The equipment may only be used for the application specified in the catalogue and the user manual, and only be used with devices or components recommended and approved by Owen Brothers Metering.

Proper handling

The prerequisites for perfect, reliable operation of the product are proper transport, proper storage, installation and proper operation/maintenance. When operating electrical equipment, parts of this equipment automatically carry dangerous voltages. Improper handling can therefore result in serious injuries or material damage.

- ✧ Use only insulated tools.
- ✧ Do not connect while circuit is live.
- ✧ Mount the meter only in dry surroundings.
- ✧ Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- ✧ Make sure the conductors are suitable for the maximum current of this meter.
- ✧ Make sure the AC wires are connected correctly before activating current/voltage.
- ✧ Do not open circuit Current Transformers while load is present in the conductor.
- ✧ Make sure the protection cover is in place after installation.
- ✧ Installation, maintenance and reparation should only be done by qualified personnel.
- ✧ Never break the seals and open the front cover as this will void MID / UKCA Certification & Warranty.

Disclaimer

The contents of this publication have been checked to ensure the descriptions are as accurate as possible.

1.2 Foreword

Thank you for purchasing the OB434 series DIN rail three phase four wire energy meter.
The warranty period is 12 months from the date of purchase. If the meter seal is broken the warranty is invalid. Installation should be performed by qualified personnel, familiar with related procedures, regulations and risks.

We produce Owen Brothers Metering OB434 series meter according to EN50470-3, UKCA & MID Regulations.
For Technical Support please contact support@owen-brothers.com

1.3 Performance criteria:

Operating humidity	≤ 75%
Storage humidity	≤ 95%
Operating temperature	-25°C - +60°C
Storage temperature	-40°C - +70°C
International standards	EN50470-1, EN50470-3
Accuracy class	B
Protection against penetration of dust and water	IP51
The mechanical and electromagnetic environment class	B
Insulating encased meter of Protective class	Ⅱ

1.4 Meter specifications:

Meter type	OB434 (Modbus/M-bus)
Nominal voltage (Un)	230/400V AC (3~)
Operational voltage	80% Un ~ 120%Un
Insulation capabilities:	
- AC voltage withstand	4KV for 1 minute
- Impulse voltage withstand	6KV – 1.2μS waveform
Basic current (Ib):	
CT type	1.5A
Directly connect	5A
Maximum rated current (Imax)	
CT type	6A
Directly connect	100A
Operation current range	0.4% Ib ~ Imax
Over current withstand	30Imax for 0.01s
Operational frequency range	50Hz ±10% / 60Hz ±10%
Internal power consumption	≤2W / 10VA per phase
Test output flash rate (PULSE LED)	1000imp/kWh (optional)
CT Changing-Ratio	30 ratios to choose

Power supply indicator (Phase A, B & C LED) - Meter connected A/B/C voltage power detected
Consumption indicator (PULSE & SO LED) - Flashing = load running
Data retention - The data can be stored for more than 20 years when power is off

1.5 RS485 Modbus / M-Bus Communication

RS485 Modbus communication specifications:

Bus type	RS485
Protocol	MODBUS RTU with 16 bit CRC
Baud rate	1200,2400(default),4800,9600, (19200 optional version)
Address range	1-255 user settable
Bus loading	32 meters per bus
Rage	1000m

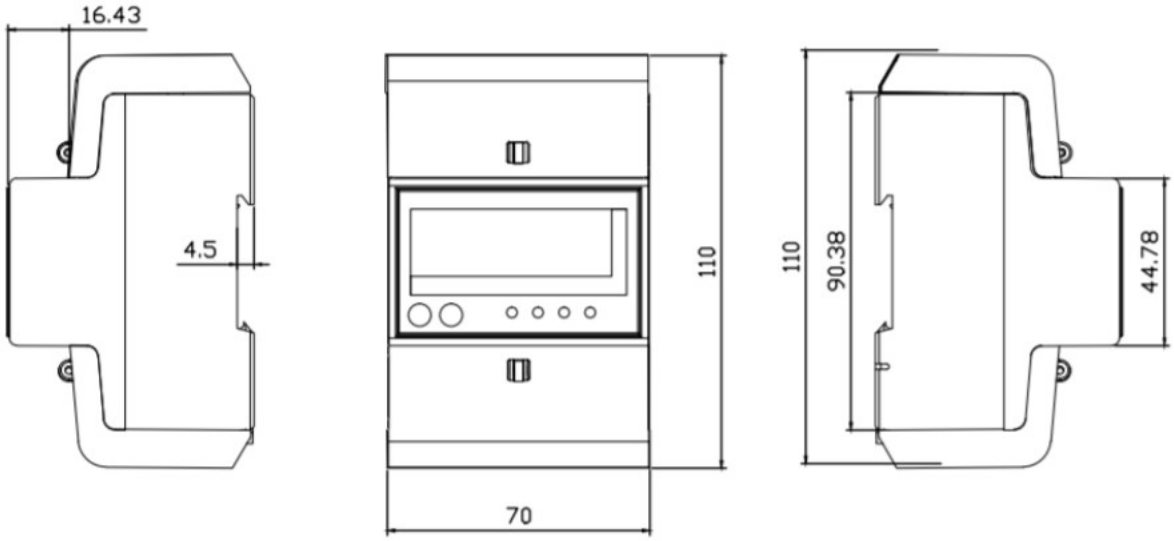
M-Bus communication specifications:

Bus type	M-bus
baud rate	2400 (default)、4800, 9600
Range	≤1000m 64PCS*
Downlink signal	Master to slave，Voltage modulation
Uplink signal	Slave to master，Current modulation
Cable	JYSTY （n×2×0.8）
Protocol	EN13757-3
Max. Number of meters	64*

*Note that the maximum number of meters is dependent on the Modbus/MBus Master baud rate (higher the baud rates reduce the number of meters that can be used) and the circumstances under which the meters are installed.

1.6 Dimension

Height1	90 mm (without protect cover)
Height2	94mm (with short protect cover) *Default type
Height3	110mm (with long protect cover)
Width	70 mm
Depth	64.5 mm
Weight	0.4 Kg (net)



Material

Front panel	PC Fire retardant
Cover	ABS Fire Retardant
Base	ABS Fire Retardant

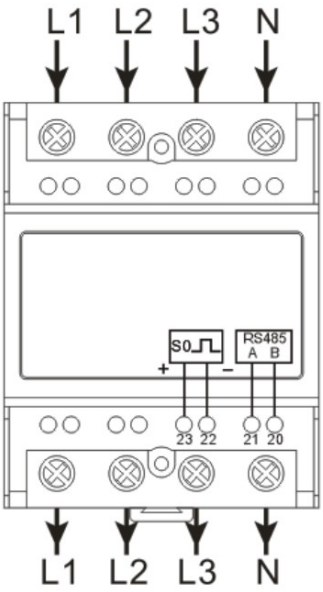
1.7 Installation

⚠ CAUTION
♦ Turn off all the power before working on it. ♦ Always use a properly rated voltage sensing device to confirm that power is off.
⚠ WARNING
♦ Installation should be performed by qualified personnel familiar with the related procedures and regulations. ♦ Use insulating tools to install the meter.

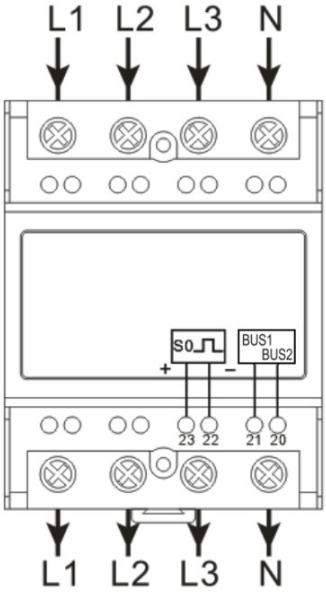
- ✧ The meter must be installed in an enclosure when placed in dangerous or dusty environments.
- ✧ The meter can be installed on a 35mm DIN rail.
- ✧ All connections should be done in accordance with the wiring diagram.

Wiring diagram:

1) Direct connection type:

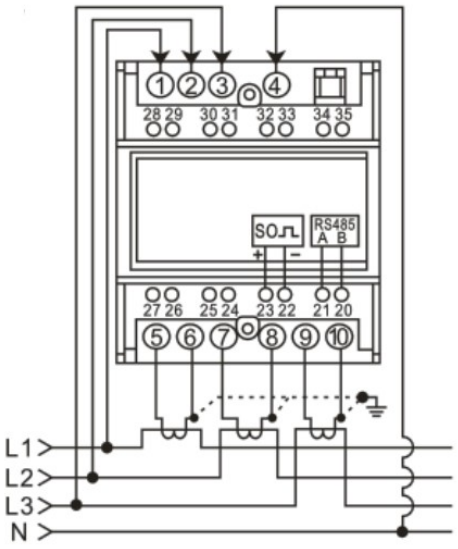


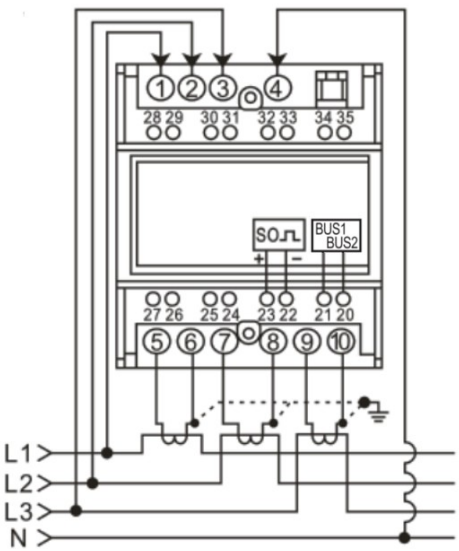
Modbus -optional



M-bus -optional

2) CT connection type:





Modbus -option **M-bus -option**

connection diagram			
22	active pulse contact "-"	23	active pulse contact "+"
20	BUS2 (MBUS) / RS485 B (Modbus)	21	BUS1 (MBUS) / RS485 A (Modbus)
1	L1 phase wire	2	L2 phase wire
3	L3 phase wire	4	Neutral wire
5	CT1 – S1	6	CT1 – S2
7	CT2 – S1	8	CT2 – S2
9	CT3 – S1	10	CT3 – S2

1.8 Operating

Consumption indication:

The LCD will display L1, L2, L3, when voltage and current is detected

The other indicator is for pulse output. When consumption is detected; the LED will flash. The LED pulses in relation to consumption i.e., Higher pulses = Higher consumption.

Pulse output

The OB434 Series DIN rail energy meter is equipped with a pulse output which is optically isolated from the main circuit.

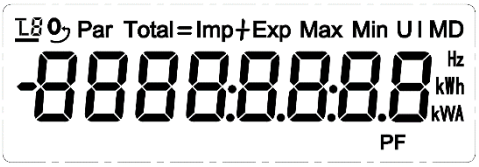
Reading the meter:

The energy display is 6+2(999999.99) as default and can be customized into 7+1(9999999.9).

Total Active Energy: Total=Import **+**Export (default); Total=Import **-** Export (Optional).

LCD displays

When power on, LCD displays as follows,

Parameters	Format of LCD display	Display Status
Full screen		Power on (display 3s)

Software version		Power on (display 2s)
Pulse Constant		Power on (display 2s)
Total Active Energy Total=Import +Export (default)		Power on (999999.99 default) (9999999.9 optional)
Total Active Energy Total=Import – Export (Optional)		Displaying all the time (999999.99 default) (9999999.9 optional)

Click the button on the front of the meter, LCD displays as follows,

Parameters	Format of LCD display	Display Status
Total Active Energy Total=Import + Export		Constant Display (999999.99 default)
Import energy		Displayed by clicking front button
Export energy		Displayed by clicking front button
Partial Total Energy Total=Import + Export (For Resettable type only)		Displayed by clicking front button

Partial Import Energy (For Resettable type only)		Displayed by clicking front button
Partial Export Energy (For Resettable type only)		Displayed by clicking front button
Total Active Power		Displayed by clicking front button
Import Active Power		Displayed by clicking front button
Export Active Power		Displayed by clicking front button
L1 Voltage		Displayed by clicking front button
L2 Voltage		Displayed by clicking front button
L3 Voltage		Displayed by clicking front button
L1 Current		Displayed by clicking front button

L2 Current		Displayed by clicking front button
L3 Current		Displayed by clicking front button
Total Current		Displayed by clicking front button
Power Factor		Displayed by clicking front button (For Modbus/M-bus only)
Frequency		Displayed by clicking front button (For Modbus/M-bus only)
Baud Rate		Displayed by clicking front button (For Modbus/M-bus only)
ID		Displayed by clicking front button (For Modbus/M-bus only)
Serial Number High		Displayed by clicking front button (For Modbus/M-bus only)

Serial Number Low		Displayed by clicking front button (For Modbus/M-bus only)
CT Ratio (For CT type only)		Displayed by clicking front button

NOTE: If you do not click the button again for more than 10s, the total active energy of the first screen is automatically displayed.

1.9 CT Ratio Setting

Please set the CT Ratio after installation, default Ratio (5:5).

Procedures of setting the CT Changing- Ratio of CT Meter:

1. Connect the meter according to the CT Wiring Diagram.
2. When initially powered up, the LCD displays test screen.
3. When in the normal or cycle display press **button-1** **(on the front side)** to display the CT Ratio, short press the CT ratio setting **button-2 (Under the terminal Cover - pin 35)** to enter the CT ratio setting password, LCD displays flashing characters "pd 000"(after 8 seconds it will automatically exit without operation);
4. Enter the required number for the first digit on the right, press the CT setting button-2 to switch the digits value. Now, press the cycle button-1 to input the second and third digits. After the 3 digits are entered, press the CT setting button to confirm the ratio.
5. When the password is correct, enter the CT ratio setting item, and the symbol of "5:5" will flash; select the CT ratio through the cycle button-1, press CT settings button-2 to confirm the selection after confirming, and then exit automatically:

   There are 30 CT Ratios selections to choose from ("5:5, 20:5, 30:5, 40:5, 50:5, 60:5, 75:5, 100:5, 120:5, 150:5, 200:5, 250:5, 300:5, 350:5, 400:5, 500:5, 600:5, 750:5, 800:5, 1000:5, 1200:5, 1250:5, 1500:5, 1600:5, 2000:5, 2500:5, 3000:5, 4000:5, 5000:5, 7500: 5") you can choose from.

6. Click cycle button-1, to check the CT ratio again to confirm your selection.

Please Note,

If the password is wrong, it will display "Err", it will flash for 2 seconds then exit, and automatically enter

normal display state. Please retry.

7. Changing the password,

1> Press button-1, to display CT ratio screen (such as 5:5);

2> Long press button-2, will display Pd0 000, enter the password,

3> After inputting the password correctly, Pdn 000 is displayed, set the New Password and press button-2 to confirm. Do not forget the password you set

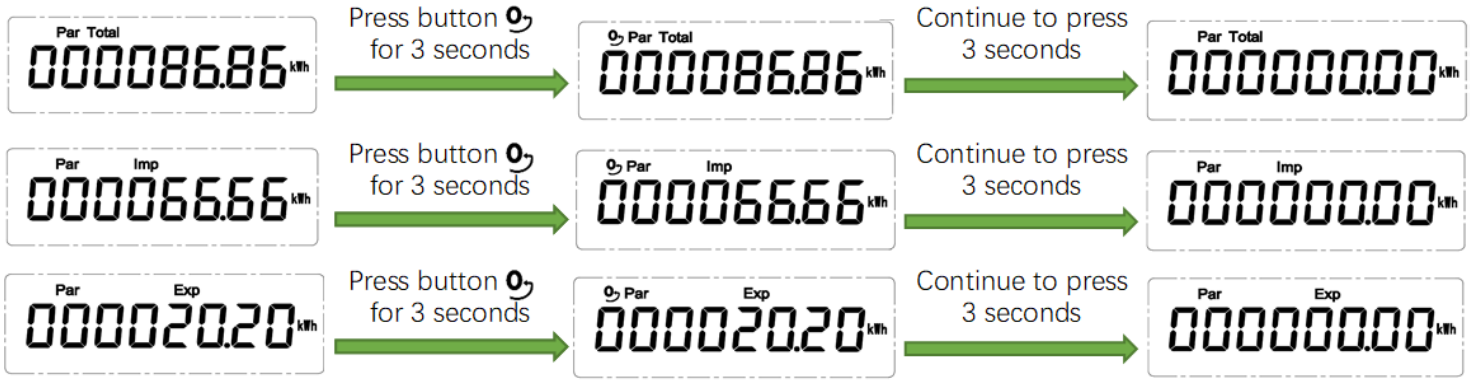
Please note,

If there is a password error, Err is displayed, LCD will flash for 2 seconds then exit.

Any step of the above operation will automatically return if idle for 8 seconds.

1.10 Reset Setting - Partial energy(kWh) (Optional - For Resettable type only)

Press button for 3 seconds, the LCD will display the reset symbol of " ", and then continue to press 3 seconds to reset the Partial Total energy, Partial Import energy, and Partial Export energy at the same time.



1.11 Technical support

Please contact: support@owen-brothers.com

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