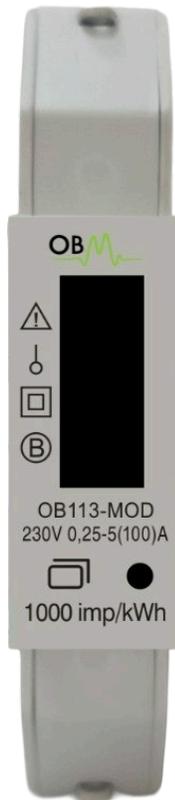


## OB113 MODBUS

Single Phase Two Wire DIN Rail Energy Meter with Modbus 100A

One module 17.5mm width



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# User Manual



## 1.1 Safety instruction

### Information for Your Own Safety

This manual does not cover all safety measures for operating the devices, as additional precautions may be required under specific operating conditions or local regulatory requirements. However, it contains essential information that must be read to ensure personal safety and prevent property damage. Such information is highlighted using warning triangle symbols and is categorized according to the level of potential hazard as follows.



#### Warning

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



#### Caution

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

### Qualified personnel

Operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in this manual means person who are authorized to commission, start up, ground and label devices, systems and circuits according to safety and Regulatory standards.

### Use for the intended purpose

The equipment (device, module) may only be used for the application specified in the catalogue and the user manual, and only be connected with devices and components recommended and approved by Owen Brothers.

### Proper handling

The prerequisites for perfect, reliable operation of the product are proper transport, proper storage, installation and proper operation and 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 insulating tools.
- Do not connect while circuit is live (hot).
- Do not connect the meter to a 3 phase -400VAC – network.
- Place 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 wires are suitable for the maximum current of this meter.
- Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- Do not touch the meter connecting clamps directly with metal, blank wire and your bare hands as you may get electrical shock.
- Make sure the protection cover is placed after installation.
- Installation, maintenance and reparation should only be done by qualified personnel.
- Never break the seals and open the front cover as this might influence the function of the meter, and will cause no warranty.
- Do not drop, or allow strong physical impact on the meter as the high precisely components inside may be damaged.

### Disclaimer

We have checked the contents of this publication and every effort has been made to ensure that the descriptions are as accurate as possible.

However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors contained in the information given. The data in this manual is checked regularly and the necessary corrections are included in subsequent editions. We are grateful for any improvements that you suggest.

## Subject to technical modifications without notice

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### 1.2 Foreword

Thank you for purchasing the OB113-MOD series DIN rail single phase two wire energy meter. With the Owen Brothers Metering UK Ltd product range we have provided a large scale of energy meters on the market suitable for 110V AC to 400V AC (50 or 60Hz). For more information on other products please contact our sales department at sales@owen-brothers.com

12 months warranty from date of purchase providing meter seal is intact. In the unlikely event of an issue, please contact support@owen-brothers.com

### 1.3 Performance:

Operating humidity	≤ 75%
Storage humidity	≤ 95%
Operating temperature	-25°C -+55°C
Storage temperature	-40°C -+70°C
International standard	IEC62052-11 and IEC62053-21 EN 50470-1 and EN 50470-3
Accuracy class	1/B
Protection against dust and water	IP51
Mechanical environment classes	B
Insulating encased meter of Protective class	II

### 1.4 Specification:

Meter type	OB113-MOD (LCD display)
Nominal voltage (Un)	230V AC
Operational voltage	(-15% ~ +10%)Un
Insulation capabilities:	
-AC voltage withstand	4KV for 1 minute
-Impulse voltage withstand	6KV – 1.2μS waveform
Basic current (Ib):	5A
Maximum rated current (Imax)	100A
Operational current range	0.4% Ib-Imax
Over current withstand	30Imax for 0.01s
Operational frequency range	50Hz ±10%
Internal power consumption	≤2W / 10VA
Test output flash rate (RED LED)	1000imp/kWh (optional)
Consumption indicator (RED LED)	Flashing at load running
Consumption indicator (PULSE &SO LED)	Flashing at load running
Data save	Data can be stored more than 20 years when power off

**1.5 Accuracy:**

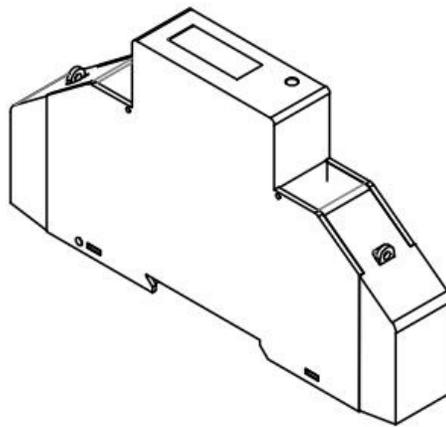
0.05lb	Cosφ = 1	±1.5%
0.1lb	Cosφ = 0.5L	±1.5%
	Cosφ = 0.8C	±1.5%
0.1lb -Imax	Cosφ = 1	±1.0%
0.2lb -Imax	Cosφ = 0.5L	±1.0%
	Cosφ = 0.8C	±1.0%

**1.6 Communication:**

**Modbus specification:**

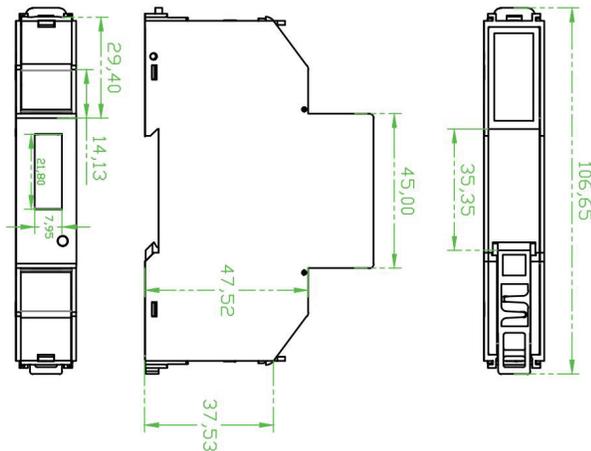
Bus type	RS485
Protocol	MODBUS RTU with 16-bit CRC
Baud rate	1200, 2400, 4800, 9600(default), 19200, 38400
Address range	1-247 user settable
Bus loading	64 meters per bus
Range	1000m

**1.7 Dimension**



Long terminal cover

Height	122 mm (Long terminal cover)
Width	17.5 mm
Depth	66.5 mm
Weight	0.1 Kg (net)



**Material**

Front panel	PC inflammable retarding
Meter Case	PC Alloy inflammable retarding
Terminal block	PC Alloy inflammable retarding
Protection cover	PC Alloy inflammable retarding

**1.8 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.

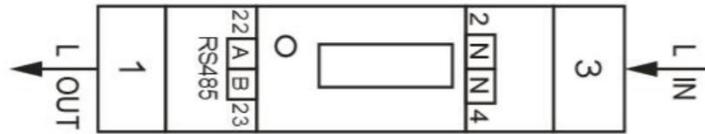


**WARNING**

- ◆ Installation should be performed by qualified personnel familiar with related procedures and regulations.
- ◆ Use insulating tools to install the meter.
- ◆ Fuse or thermal cut-off or single-pole circuit breaker can't be fitted on supply line and not the neutral line.
- ◆ The case is sealed, do not broken it
  - We recommend that the connecting wire which is used to connect the meter to the outside circuit should be sized according to local codes and regulations for the capacity of the circuit breaker or over current device used in the circuit.
  - An external switch or a circuit-breaker should be installed on the inlet wire, which will be used as a disconnection device for the meter. And there it is recommended that the switch or circuit-breaker is near the meter so that it is more convenience for the operator. The switch or circuit-breaker should comply with the specifications of the building electrical design and all local regulations.
  - An external fuse or thermal cut-off which will be used as a over-current protection device for the meter must be installed on the supply side wire, and it is recommended that the over-current protection device is near the meter so that it is more convenience for the operator. The over-current protection device should comply with the specifications of the buildings electrical design and all local regulations.
  - This meter can be installed indoor directly, or in a meter box which is waterproof outdoor, subject to local codes and regulations.
  - To prevent tampering, secure the meter with a padlock or a similar device.
  - The meter has to be installed against a wall which is fire resistant.
  - The meter has to be installed in a good ventilated and dry place.
  - The meter has to be installed in a protection box when placed in dangerous or dusty environment.
  - The meter can be installed and used after being tested and sealed with a letter press printing.
  - The meter can be installed on a 35mm DIN rail.
  - The meter should be installed in an available height so that it is easy to read.

- When the meter is installed in an area with frequent surges due to eg. thunderstorms, welding machines, inverters etc., protect the meter with Surge Protection Devices.
- After finishing installation, the meter must be sealed to prevent tampering.
- Connection of the wires should be done in accordance with the underneath connection diagram.
- Connection of the wires should be done in accordance with the underneath connection diagram.

**Wiring Diagram:**



- 3 L IN
- 1 L OUT
- 2 and 4 Neutral line
- 22 RS485 A / MBUS 1
- 23 RS485 B / MBUS 2

**Specification for Screw terminals and torque**

	3∅: 1 AWG / 42mm <sup>2</sup> max	Output: 14 AWG / 2.5mm <sup>2</sup> max	
			 L/N: 1,2 Nm Max Output: 0,2 Nm Max
	+ ∅ 7mm max	+ ∅ 1.5mm	

Description	Size
The nominal torque to fasten the screws for L	1.2Nm
The nominal torque to fasten the screws for test N 2 to 4 and RS485 22 to 23	0.2Nm
The size (cross section) of screwable cables for L, min to max	0.8-42mm <sup>2</sup>
The size (cross section) of screwable cables for test pulse output, min to max	0.12-2.5mm <sup>2</sup>

**1.9 Operation**

**Consumption indication**

There is a LED which has two colors (green and red) while flashing in the front panel of OB113-MOD series. When consumption happens, the LED will flash and display red. The more quickly LED flash, the more consumption there is.

**Reading the meter**

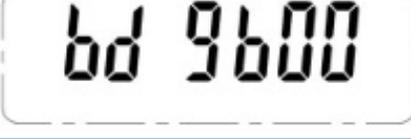
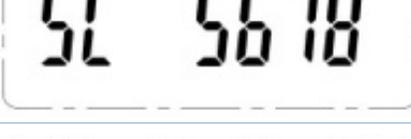
OB113-MOD energy meter is equipped with 5+2 LCD display (6+1 LCD display available) which is used as recording consumption and can't be reset to zero. The reading accuracy is 1/10 kWh (1/100 kWh).

**Pulse output**

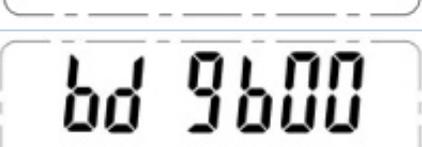
The OB113-MOD Series DIN rail energy meter is equipped with a pulse output which is fully separated from the inside circuit. That generates pulses in proportion to the measured energy for accuracy testing.

**LCD Displays**

Cycle display status, Display cycle can be set. The display items as following:

Parameters	Format	LCD displays	LCD display method
Full screen	88888.8.8		Power on
Software Number	6 letters		Power on
Constant	C 1000		Power on
Baud Rate	BD 9600		Power on
ID number	ID 001		Power on
Serial number	SH (High four digits)		Power on
	SL (Low four digits)		
Total active kWh	XXXXX.XX (XXXXXXXX.X)		Cycle display
Import active kWh	XXXXX.XX		Cycle display

Parameters	Format	LCD displays	LCD display method
Export active kWh	XXXXX. XX		Cycle display
Total Reactive kWh	XXXXX.XX (XXXXXXXX.X)		Protocol settle
Import Reactive kWh	XXXXX.XX		Protocol settle
Export Reactive kWh	XXXXX.XX		Protocol settle
Part Active kWh	XXXXX.XX		Protocol settle
Part Reactive kWh	XXXXX.XX		Protocol settle
Voltage	V XXX.X		Protocol settle
Current	A XX.XX		Protocol settle
Active power	P XXX.XX		Protocol settle

Parameters	Format	LCD displays	LCD display method
Reactive power	RP XXX.XX		Protocol settle
Apparent power	AP XXXXX		Protocol settle
Power factor	PF X.XX		Protocol settle
Frequency	F XX.XX		Protocol settle
Constant	C XXXX		Protocol settle
Baud rate	BD XXXX		Protocol / Button settle
ID number	ID XXX		Protocol / Button settle
Parity	P XXX		Protocol / Button settle
Serial number	SH XXXX (high four digits)		Protocol / Button settle
	SL XXXX (low four digits)		

## 1.10 Button Setting

Baud rate, ID, serial number (parity bit) can be set via the touch button on the front of the meter.

Setting instruction is as follows:

The user long presses the button to select the desired setting item. After completing this setting, press the button briefly again to select the next setting item.

Note: The baud rate (parity mode) is selected by choosing the required numerical value; the ID and serial number are set via numerical input.

For example:

1> Change baud rate: Long press the button to select the baud rate display item, then choose the required baud rate value (1200, 2400, 4800, 9600, 19200, 38400).

2> Setting ID and serial number requires digit-by-digit configuration. Set the first digit and wait for the next digit to flash; repeat this process until all digits are set.

## 1.11 Trouble shooting

Problem	Check	Solution
No light for the Power supply indicator.	Is AC power supply connected to the meter? Is the 1 and 4 connecting correct? Maybe there is a fault in the inside circuit.	Check switch or circuit-breaker and fuse or thermal cut-off. Reinstall terminal screws on the 1 and 4. Make sure all screws are fixed. Then there should be a 230V 50Hz AC voltage between the terminal screws on the 1 and 4 when power supply is input. Please contact your technical supporter to replace this meter.
No light for the consumption indicator.	Is the load running? Is the operating power too low? Maybe there is a fault in the inside circuit.	Only when load is running, this LED will flash. If the operating power is too low, the spacing interval of flashing will take some more time, this is why it seems like LED isn't burning. Please contact your technical supporter to replace this meter.
The register can't run.	Is there a power supply inside the meter? Is the operating power too low? Maybe there is a fault in the inside circuit.	Check that the power supply indicator is burning. If the operating power is too low, the spacing interval of the pulses will take some more time, this is why it seems like the meter won't count. Please contact your technical supporter to replace this meter.
No pulse output.	Is DC power supply connected to the meter? Is the connecting, correct? Maybe there is a fault in the inside circuit.	Check the external voltage source (Ui) is 5-27V DC. Check correct connecting: connect 5-27V DC to connector 20 (anode), and the signal wire (S) to connector 21 (cathode). Please contact your technical supporter to replace this meter.
Pulse output rate wrong.	Maybe there is a fault in the inside circuit.	Please contact your technical supporter to replace this meter.
No communication Of RS485 wire data with the meter	Is the meter ID correct?	Check and use the correct the Meter ID. After the meter finish the production, the Meter ID defaults to 0~ 67H ,69H~FFH .
	Is the communication distance too long?	Shorten the communication distance between the reading equipment outside and the meter. Keep sure it is not more than 1200m The equipment to connection with RS485 main wire is not more than 256pcs
	Are there too many meters connected to RS485 main wire?	The correct connection is: the A signal wire of RS485 main wire to
	Is the RS485 port connection, correct? Is the connection	the meter terminal 22, the B signal wire of RS485 main wire to the meter terminal 23
	Maybe there is a fault in the inside circuit.	Please connect with technical supporter to replace this meter.

## 1.12 Technical support

Please contact

<b>TEL:</b>	0161 624 6211
<b>Email:</b>	support@owen-brothers.com
	www.owen-brothers.com

