User Manual Revision 3.001

English

Smart energy meter

OB415 Series

www.owen-brothers.com

Benefits and Main Features

- Single phase metering 4 din modules.
- Standard DIN rail Format (DIN43880)
- Cl.1 Accuracy (ENS0470)
- Isolate pulse output and IR (DIN43864)
- Energy Consumption LED & Reverse Current LED
- Communication LED
- LCD display, 6 integer 2 decimal,
- Large clear display with backlight
- Internal transformer
- Direct metering up to 100A
- RS485 communication port, Modbus RTU.
- IR port
- Program by button on the name plate
- Memory back-up (EEprom)
- CE Approved
- MID approved. Annex B & D

★ The meter is intended to be installed in a Mechanical Environment ‘M1’, with Shock and Vibrations of low significance, as per 2004/22/EC Directive and should be installed in Electromagnetic Environment ‘E2’, as per 2004/22/EC Directive.

Model Number	*Communication output*
OB415-S	Pulse Output
OB415-Mb	Pulse Output & M-bus
OB415-MOD	Pulse Output, IR & RS485 Modbus RTU.

OWEN BROTHERS METERING UK LTD

Index:

1. Safety notice

PLEASE NOTE: WE SUPPLY THESE METERS ON THE ASSUMPTION THEY WILL BE INSTALLED BY A QUALIFIED ELECTRICIAN FAMILIAR WITH THE INSTALLATION OF METERING EQUIPMENT.

All meters must be installed according to applicable wiring diagram. Incorrect connections to the electricity network will cause major display problems and can cause serious damage to the meter.

Before starting meter operation, it must be ensured local conditions of the energy system are consistent with the meter type and configuration. Make sure that cables (conductors) are not damaged during installation of the meter, not energized and are appropriate for the installation in question.

Capacitors within the meter may still be charged even after disconnection from all energy sources.

2. Content of delivery

Single phase electronic energy meter,
instructions for assembly
ID setting
Baud rate setting
Password setting

3. Technical Description

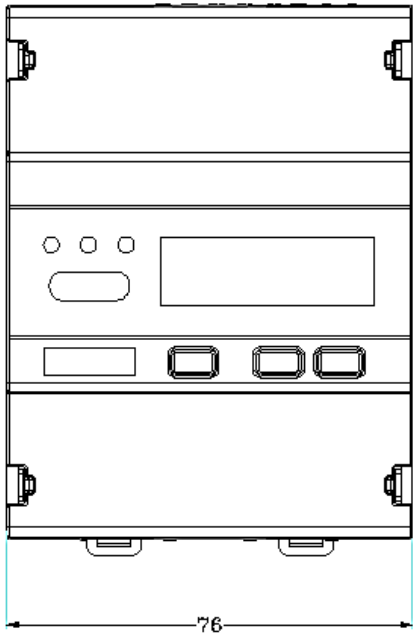
3.1 Performance criteria

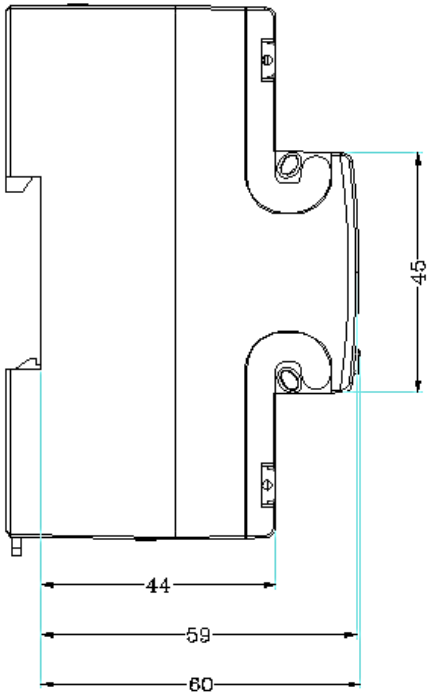
Operating humidity	≤ 75%
Storage humidity	≤ 95%
Operating temperature	-25°C - +55°C (3K6)
Temperature	-40°C - +70°C (1K4)
International standard	EN50470-3 & IEC62053-21
Accuracy class	Cl.1
Protection against penetration of dust and water	IP51
Insulating encased meter protective	Class D
Install place	Indoor meter
Connection area main terminals	
Current terminals flexible	1× 0 - 25 mm²
Other terminals flexible	1× 0 - 2.5 mm²

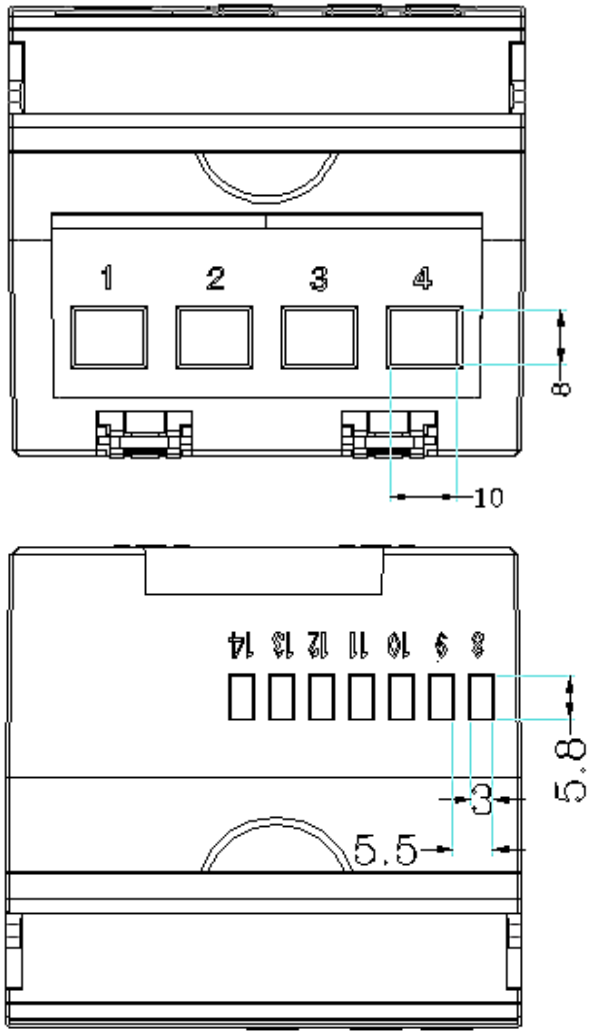
3.2 Meter specification

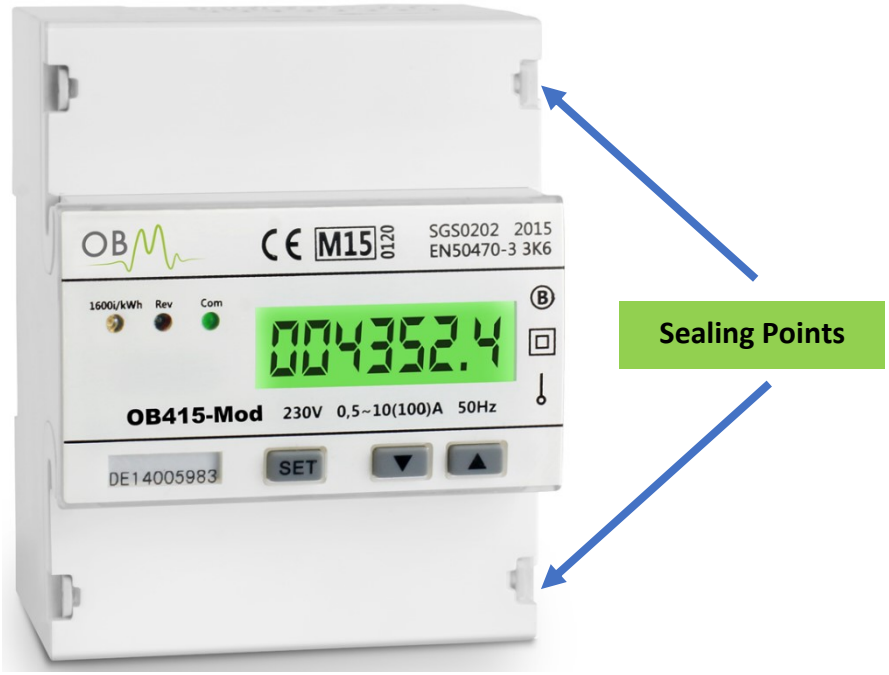
Voltage(v)	230V
Operational voltage	70% ～130% Un
-Iref	10A
-Itr	1A
-Imax	100A
-Imin	0.5A
-Ist	40mA
Power consumption of current circuits (VA)	< 0.01
Power consumption of voltage circuits (W)	< 1.3W
Frequency (Hz)	50 / 60
Memory back-up	EEprom
Environment resistance to heat and fire	Terminal 960℃ Cover 650℃
Upper	ABS+PC
Lower	ABS+PC
Pulse width (ms)	80
Pulse constant (imp/kWh)	1600
LED constant	1600
Width (mm)	72
Height (mm)	104.5
Depth (mm)	60

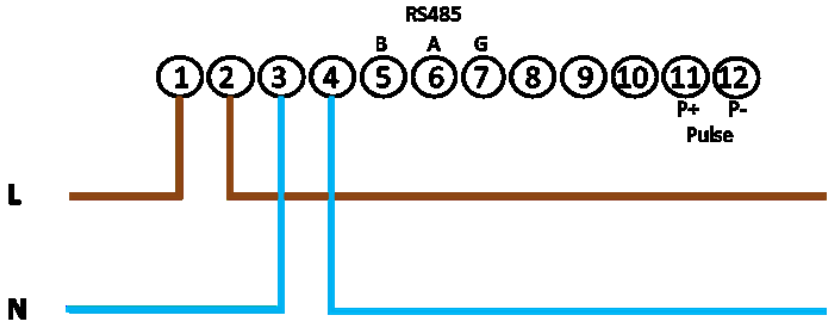
4. Dimensions and sealing points











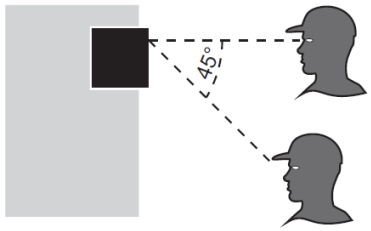
1/2	L1 in & Out		
3/4	Neutral in & Out		
5	RS485	B	TX/RX (-)
6	RS485	A	TX/RX (+)
7	RS485	GND	
8	Not Connected		
9	Not Connected		
10	Not Connected		
11/12	Test pulse output contact (12- , 11+)		

5. Wiring Diagram

Note: the following types of wiring diagrams show the energy meter terminals for pulsed output and the RS485 communication interface. However, OB415-S Model is pulse only.

6. Meter reading

Operator viewing angle should be up to 45°



7. Main functions

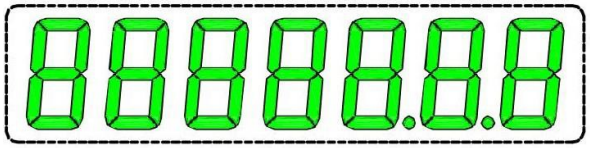
7.1 Measuring Function

On the OB415'S front panel are three LED's,
Active energy pulse, current reverse & communication indicators.
The constant of the impulse is shown on the front name plate of the meter.

7.2 Display

The OB415 meter has 3 display cycles,
Self-test, auto display cycle & button press cycle.

Upon 1st powerup, the meter will test the display.



Followed by displaying the meter version number.

After completing the self-test cycle, the meter will switch to auto display cycle and display the following:

Active energy 

7.2 Display Continued.

Pressing the buttons on front panel will cycle through the following:
(Models OB415-Mb & OB415-MOD Only)

ID 

Serial number (high bits) 

Serial number (low bits) 

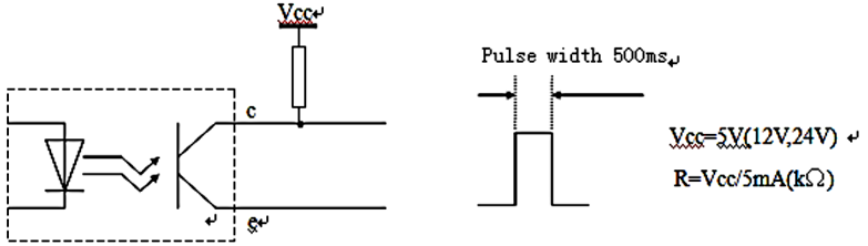
Serial number = 000001303019

Baud rate 

Active energy 

7.3 Pulse output

The OB415 smart meters are equipped with a pulse output which is fully separated from the live circuits.
It generates pulses in proportion to the measured energy including the pulse output of active energy and reactive energy.
11 / 12 Test pulse output contact (P+ / P- 11 / 12)
The test pulse output is a polarity dependent, passive transistor output requiring an external voltage source for correct operation. This external voltage source, the voltage (Ui) should be 5-27v DC, and the maximum input current (Imax) should be 27mA DC.
To connect the impulse output, connect 5-27v DC to connector 12 (anode), and the signal wire (S) to connector 11 (cathode). The meter pulses are indicated on the front panel.



7.4 IR communication (Infrared port)

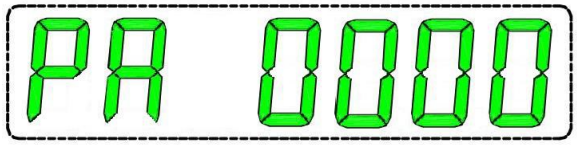
The infrared communication port is on the right of the LCD.
infrared wireless communication port used with a HHU (hand held unit) can directly communicate the data between the meter and this port. The data transmission speed is 1200bps.
The communication distance is maximum 5m.

7.5 RS485 Communication Port.

RS485 Protocol	OB415-S	None
	OB415-MOD	Modbus RTU
	OB415-Mb	M-bus
Data format		8 data bits, NONE, 1 stop bit
Baud rate		1200 ,2400 ,4800 ,9600
Address range		1-256
Bus loading		64pcs
Cable		AWG 18

8 Programming

Holding the “SET” key pressed for at last 3 seconds starts menu programming mode. LCD shows:



8.2 Password Verify

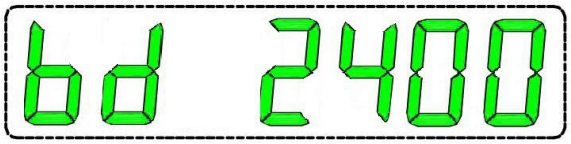
PA followed by the currently memorized value.
“PA” means “Password”, “0000” is the 4 digits to enter the Password. Press ▼ button to decrease the input value, and press ▲ to increase the input value. Press “SET” button to input digit and move to next digit. Once the correct password is entered, the meter will enter programming mode.
- - - Please ensure to remember password if altered. - - -

8.3 ID Setting

After the password authentication, the meter will display the "ID XX" setup interface. As the following picture "Id 00" it means the current ID address is 00 (the ID
slave address hex code)

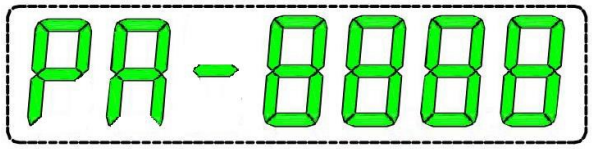
Press ▼ button to decrease the digits.
Press ▲ button to increase the digits.
press "SET" button to save the setup, the interface will switch to Baud rate setup automatically. Press "SET" to skip to next menu item if no changes are required.

8.4 Baud rate setting



Press ▼ button to decrease the input value.
press ▲ button to increase the input value.
press the "SET" button to confirm.
1. Default baud rate is 9600.
2. 1200/ 2400 / 4800/ 9600 can be selected.

8.5 Password Setting



The meter will display the current password after entering the password setup menu, press the "SET" key to change the password. Use ▲ and ▼ button to input new password. After 30 seconds the meter will save the password you chose.
Remarks:
1 Do not forget the password that you have setup.
2 Press the buttons to check if setup is correct.
3 Password setup interface "- "symbol will blink.

9 Basic errors

Value of current	Power factor	Errors	Test pulse number
Imin	1.0	±1.5%	4
Itr	1.0	±1.0%	4
Itr	0.5ind	±1.5%	4
Itr	0.8cap	±1.5%	4
10Itr	1.0	±1.0%	8
10 Itr	0.5ind	±1.0%	8
10Itr	0.8cap	±1.0%	8
Imax	1.0	±1.0%	12
Imax	0.5ind	±1.0%	12
Imax	0.8cap	±1.0%	12

10 Technical Support

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11 *Declaration of Conformity*

We, Owen Brothers Metering UK Ltd

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Ensure and declare that apparatus:

OB415-S/OB415-Mb/OB415-Mod

With the measurement range

230V, 0.5-10(100)A, 50Hz, 1600imp/kWh

Are in conformity with the type as described in the

EC-type examination certificate SGS0202

And satisfy the appropriate requirements of the Directive 2004/22/EC with the following standards:

EN 50470-1: 2006, Electricity metering equipment (AC) Part 1: General requirements, tests and test conditions. Metering equipment (class indexes A, B and C)

And

EN 50470-3: 2006, Electricity metering equipment (AC) Part 3: Particular requirements - Static meters for active energy (class indexes A, B and C)

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Company stamp and signature

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