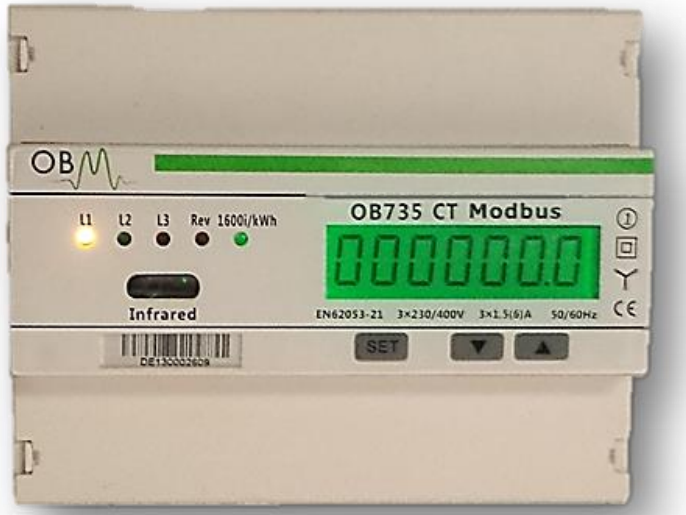
User Manual
Revision 3.002
English

OB735 Smart Energy Meter



Owen Brothers Metering UK Ltd

Benefits and Main Features

- Three phase metering
- Standard DIN rail Format (DIN43880)
- CI.1 Accuracy (EN50470)
- Energy consumption LED
- Isolated pulse output and IR (DIN43864)
- LCD display, 6 integer 1 decimal
- Large clear backlight display
- Internal transformer
- Direct metering up to 100A,transformer metering 1.5(6)A
- 27 CT rate can be selected
- Optional single-phase model
- Smart communication port, RS485 & M-bus versions available
- Can be set through front panel or via communications
- Memory back-up (EEprom)
- 7 DIN modules
- CE approval

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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.

ENSURE CTS ARE INSTALLED AS PER WIRING DIAGRAM ~ CORRECT POLARITY OF CT'S.

I.E. P1 = MAINS. P2 = LOAD OUTGOING.

CHECK SECONDARY 1 (S1) AND SECONDARY 2 (S2) ARE CORRECT AS PER WIRING DIAGRAM OTHERWISE THE METER WILL RUN IN REVERSE.

FOR HEALTH AND SAFETY REASONS IT SHOULD BE NOTED IF A CURRENT TRANSFORMER IS OPERATED WITH THE SECONDARY OPEN CIRCUITED, 50V RMS OR MORE MAY BE GENERATED AT THE SECONDARY TERMINALS OR LEADS.

2. Product contents

Polyphase, electronic energy meter, instructions for installation and operation -

ID setting

Baud rate setting

CT rate setting

Password setting

3. Technical description

3.1 Survey of types/BOM numbers

The OB735 series is labeled as follows:

OB735 . 1 . 1

- Communication type:
  - 1= pulse output:
  - 2 = Pulse output, IR &RS485
  - 3= Pulse output &M-bus
- Connect type:
  - 1= Directly connect
  - 2= Transformer connect

Ordering numbers	Connect type	Communication output
735.1.1	Directly connect	Pulse output
735.1.2	Directly connect	Pulse output, IR &RS485
735.1.3	Directly connect	Pulse output &M-bus
735.2.1	Transformer connect	Pulse output
735.2.2	Transformer connect	Pulse output, IR &RS485
735.2.3	Transformer connect	Pulse output &M-bus

3.2 Performance criteria

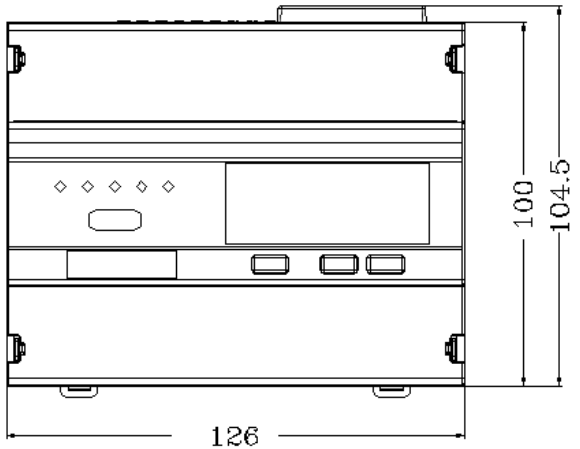
Operating humidity	≤ 75%
Storage humidity	≤ 95%
Operating temperature	-5°C - +45°C(3K5)
Storage temperature	-25°C - +55°C(3K6)
Humidity	75% yearly average, 95% 30 days/year
International standard	EN50470-3 &IEC62053-21
Accuracy class	CI.1
Protection against penetration of dust and water	IP51
Insulating encased meter protective class	Ⅱ
Connection area main terminals	
Current terminals flexible 1×mm^2	0-16mm^2
Other terminals flexible 1×mm^2	0-2.5mm^2

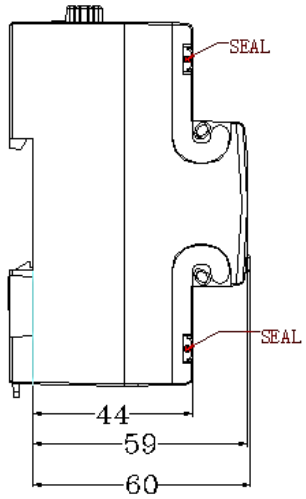
3.3 Meter specification

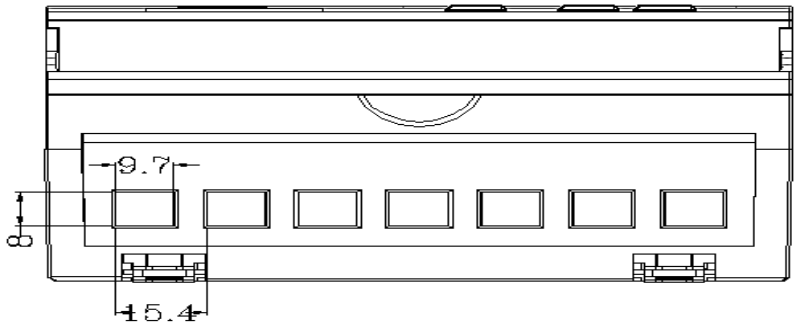
	Direct connected meters	Transformer connected meter
Voltage(v)	3×57.7/100V	3×57.7/100V
	3×220/380V	3×220/380V
	3×230/400V	3×230/400V
Operational voltage	±70%Un	±70%Un
Current(A)		
- Iref	10A	1.5
-Itr	1A	0.15A
-Imax	100A	6A
-Imin	0.5A	0.015A
-Ist	40mA	3mA

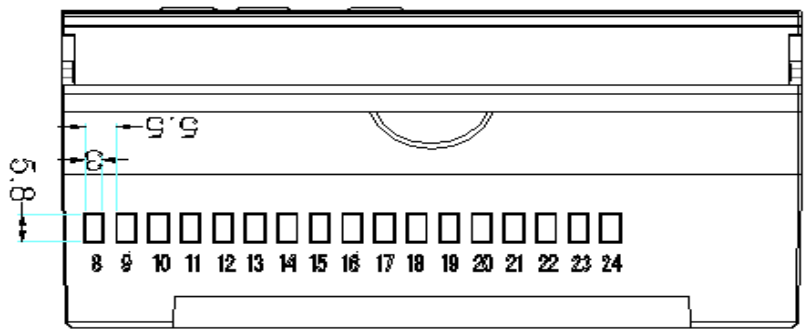
	Direct connected meters	Transformer connected meter
Power consumption of current circuits(VA)	< 0.01	< 0.01
Power consumption of voltage circuits(W)	< 1.3W	< 1.3W
General data		
Frequency (Hz)	50/60	50/60
Memory back-up	EEprom	EEprom
Environment resistance to heat and fire	Terminal 960℃ Cover 650℃	Terminal 960℃ Cover 650℃
Enclosure material		
Upper	ABS+PC	ABS+PC
Lower	ABS+PC	ABS+PC
Pulse output		
Pulse width(ms)	80	80
Pulse constant(imp/kWh)	400	1600
LED		
LED constant	400	1600
Dimension		
Width (mm)	126	126
Height (mm)	104.5	104.5
Depth (mm)	60	60

4. Dimensions and sealing points







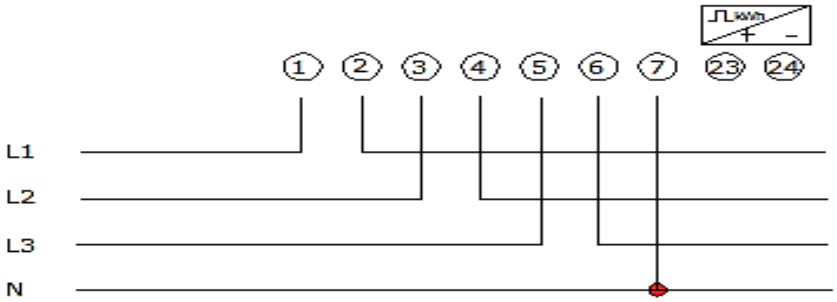


5. Wiring diagrams

Note: the following types of wiring diagrams show the energy meter, including terminals for pulse output and the RS485 communication interface. However, depending on the product number of the energy meter only some terminals of the energy meters are involved.

5.1 Direct connected meter

5.1.1 735.1.1 diagram



1/2 L1 in & out

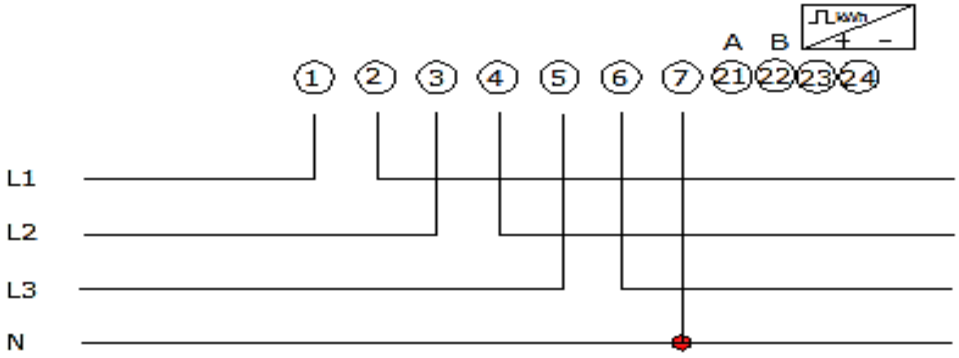
3/4 L2 in & out

5/6 L3 in & out

7 Neutral

23 &24 Test pulse output contact(24－,23+)

5.1.2 735.1.2 diagram



1/2 L1 in & out

3/4 L2 in & out

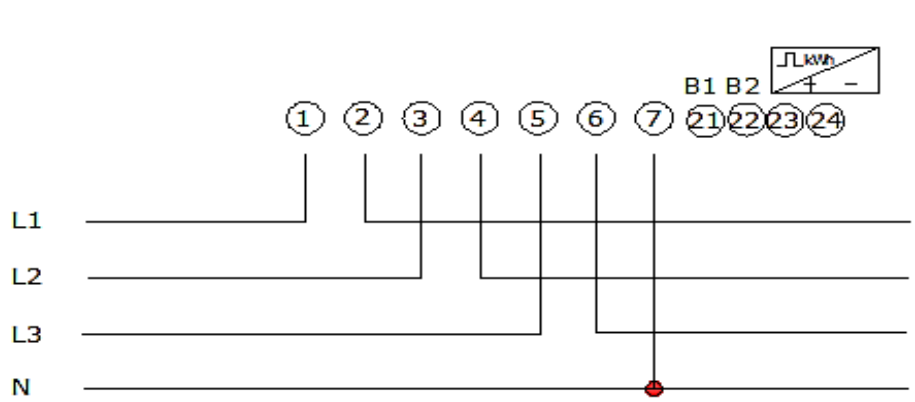
5/6 L3 in & out

7 Neutral

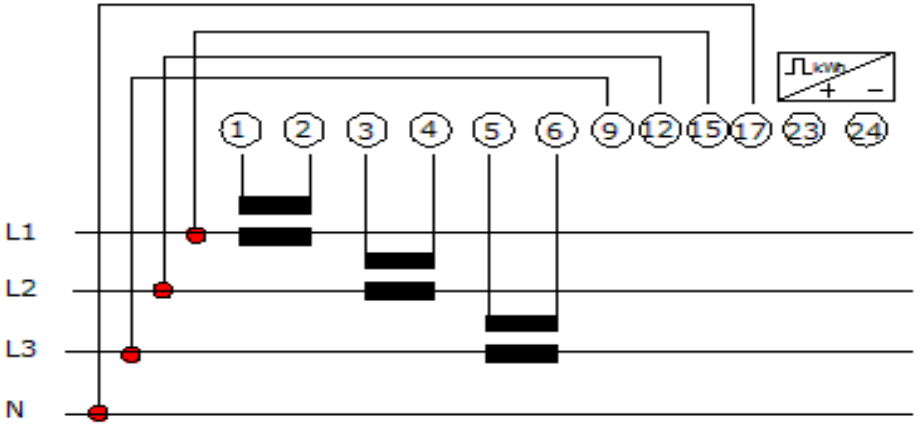
21&22 RS485 communication contacts (22 =RS485B, 21= RS485A)

23 &24 Test pulse output contacts (24-, 23+)

5.1.3 735.1.3 diagram



1/2	L1 in & out
3/4	L2 in & out
5/6	L3 in & out
7	Neutral
21&22	M-bus communication contact
23 &24	Test pulse output contact (24－,23+)

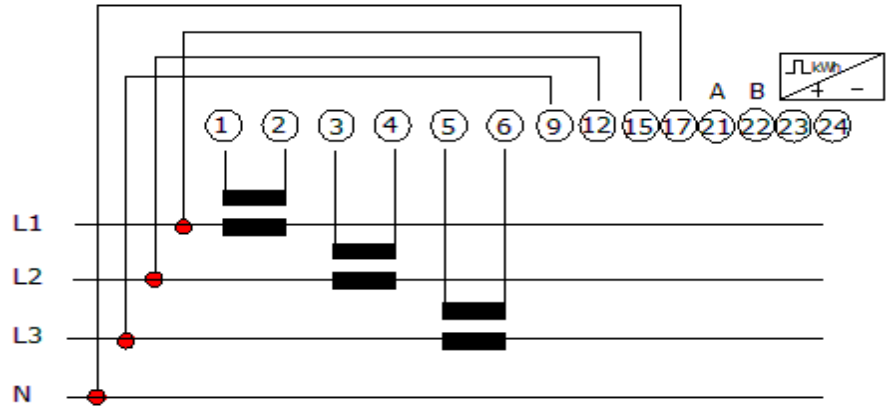


1/2	L1 in & out
3/4	L2 in & out
5/6	L3 in & out
9/12/15/17	UL3,UL2,UL1,N
23 &24	Test pulse output contacts (24－,23+)

5.2 Current Transformer connected meter

5.2.1 735.2.1 diagram

5.2.2 735.2.2 diagram



1/2 L1 in & out

3/4 L2 in & out

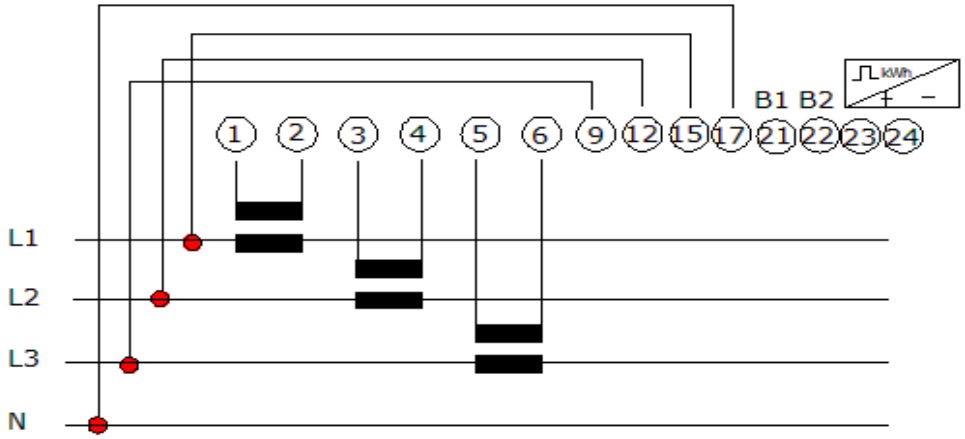
5/6 L3 in & out

9/12/15/17 UL3,UL2,UL1,N

21&22 RS485 communication contacts (22 = RS485B, 21 = RS475A)

23 &24 Test pulse output contact (24—, 23+)

5.2.3 735.2.3 diagram



1/2 L1 in & out

3/4 L2 in & out

5/6 L3 in & out

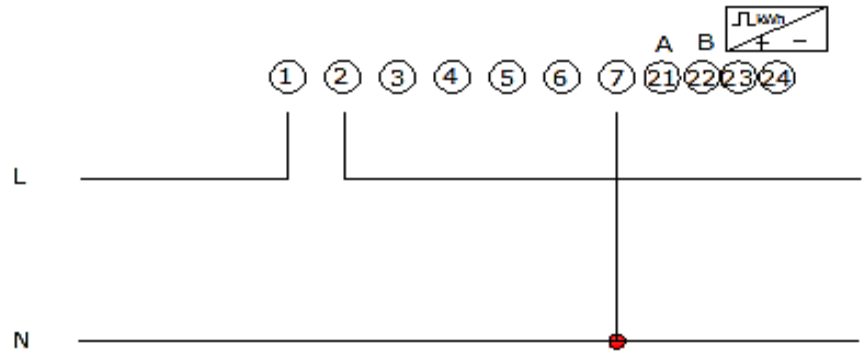
9/12/15/17 UL3,UL2,UL1,N

21&22 M-bus communication contacts

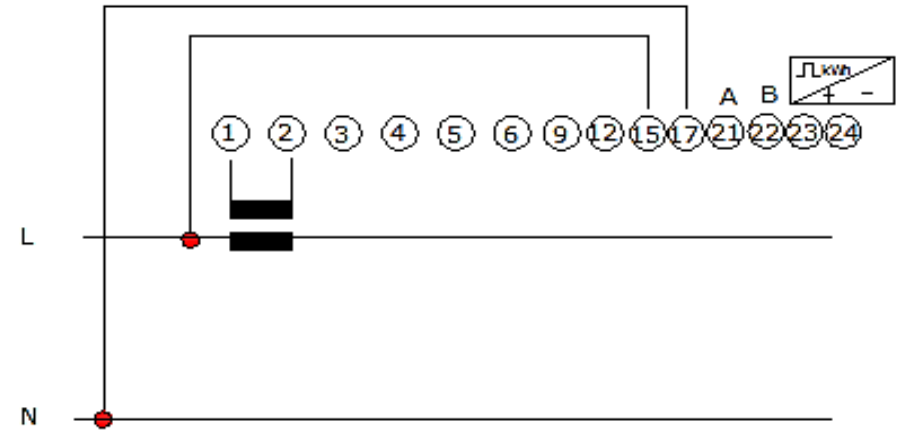
23 &24 Test pulse output contact (24—, 23+)

5.3 single phase diagram

5.3.1 Direct connected

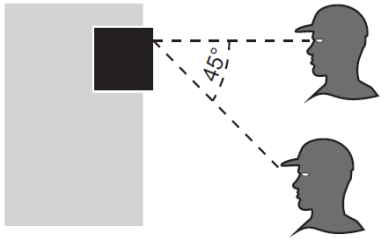


5.3.2 Transformer connected meter



6. Meter reading

Optimum Operator viewing angle should be @ 45⁰



7. Meter operation

7.1 Consumption indicators

On the OB735'S front panel, there are five LED's, respectively, for the Active energy pulse, current reverse, Phase L1, L2 & L3. The impulse constant is shown on the nameplate of the meter.

7.2 Reading the meter

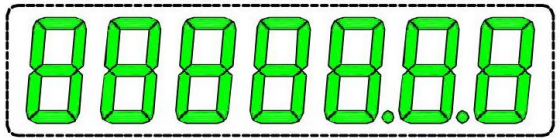
This smart energy meter is equipped with 6+1 LCD display, which is used to record consumption and can't be reset to zero. The number system is based on units of 10. With units displayed in kWh's. Data is available through RS485, PC software; HHU (hand held unit), Ethernet & GSM/GPRS Gateways with options such as Modbus TCP/IP for use with BMS/SCADA Systems.

Meters have four statuses: self-inspection status, cycle display status, button press display and programing status.

Self-inspection status：meters will come into self-inspection status after connecting electrical supply.

Self-inspection status：

Full screen display：

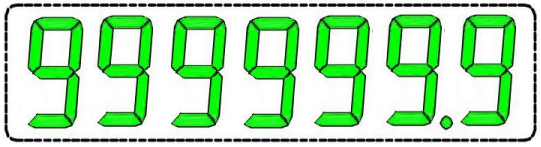


Meter version number：

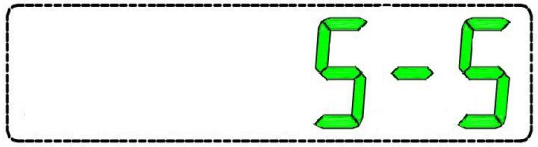
Cycle status：

Meter display as follows:

Active energy (kWh):



CT rate:

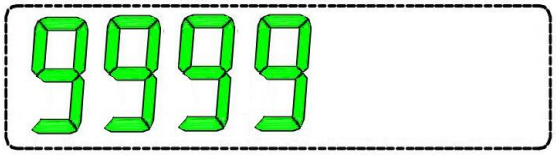


Button press display status:

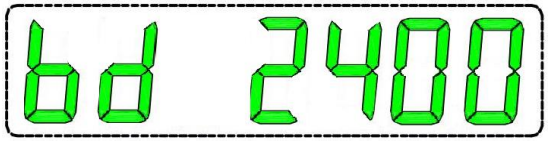
Id:

Serial number (high 4 bit):

Serial number (low 4 bit):



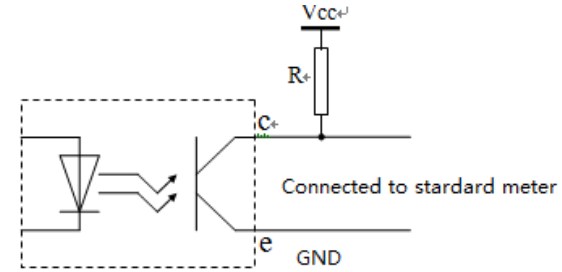
Baud rate:



7.3 Pulse output

This energy meter is equipped with a pulse output which is fully separated from the live circuits. That generates pulses in proportion to the measured energy. These are test pulse output (pins 24 & 25). Usually, the test pulse output is used for testing accuracy or reading purposes within close quarters.

The test pulse output is a polarity dependent, passive transistor output requiring an external voltage source for correct operation. For 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 25 (anode), and the signal wire (S) to connector 24 (cathode). The meter pulse is indicated on the front panel.



opto-coupler outpout into meter

7.4 Infrared interface

The infrared communication port is on the right of the LCD screen. It is an infrared wireless communication port. HHU's (hand held units) can wirelessly communicate with the meter via this port. The data transmission speed is 1200bps.The communication distance is not less than 5m.

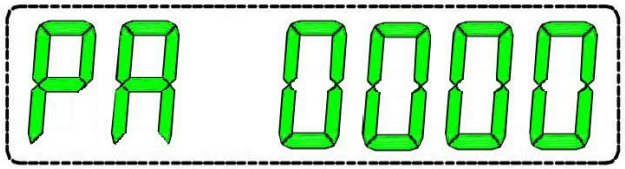
7.5 Communication port

This meter is equipped with a communication port; we can program the meter's operation data or read data via these 2 ports. (Pin26 Pin27). There are two protocol options for the communication，RS485 or M-bus.

	RS485 output	M- bus output
Protocol	Modbus RTU	EN13757-3,EN1434-3
Data format	8 data bit,Even,1 stop bit	8 data bit,Even,1 stop bit
Baud rate	1200(option),2400,4800,9600	300,2400(option),9600
Address range	1-256 User settable	1-250 User settable
Bus loading	64pcs	≤380m 250PCS ≤3600m 64PCS
Cable	AWG18	JYSTY （n×2×0.8）

8 Programming

Hold the "SET" key pressed for at last 3 seconds. Starts menu programming mode. LCD will show:



8.1 password verify

On the smart meter display will appear : PA followed by the currently memorized value . "PA" means "Password","0000"the 4 digits of the Password. we can use press "Page Down" button to decrease the input value, and press "Page Up" to increase the input value ,press the "SET" button to switch the input Password digits, when the Password is correct, the meter will enter "program status" and display the "ID" program interface.

Remarks:

Please remember the Password, you can only reset the Password to default (8888) by opening the meter and shorting "CLEAR" on the PCB board.

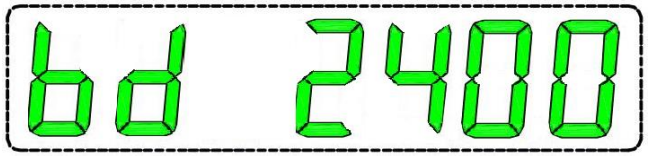
8.2 ID setting

After 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 address hex code)

Press "Page Down" button to decrease the digits. Press "Page Up" to increase the digits, press "SET" button to save the setup, the interface will switch to Baud rate setup interface automatically. Press "SET" button to enter next interface if you do not need to change the baud rate.

Remark: Type 735.1.1&735.2.1 series meters without communication function do not have the setup interface

8.3 Baud rate setting

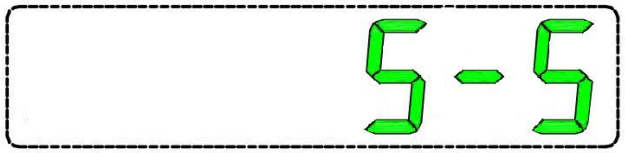


Press "Page down" and "page up" buttons to select the communication baud rate, press "SET" button to save the setup. The interface will enter CT setup.

Remarks:

1. **Type 735.1.2 &735.2.2 series meters , default baud rate will be 1200bps**
2. **Type 735.1.3 &735.2.3 series meters , default baud rate will be 2400bps**
3. **300bps /1200/2400bps /9600bps can be set**
4. **Type 735.1.1&735.2.1 series meters without communication function do not have the setup interface.**

8.4 CT rate setting



Press "Page down" and "page up" buttons to select the CT transformation ratio press "SET" button to save the setup.
The interface will enter Password setup.

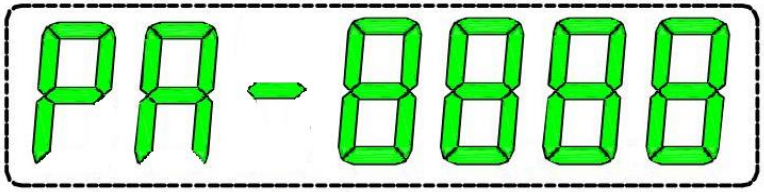
CT Rate 5/A	5:5	5:50	5:60	5:75	5:100	5:125	5:150	5:160	5：200
	5:250	5:300	5:400	5:500	5:600	5:750	5:800	5:1000	5：1200
	5：1250	5：1500	5：2000	5：2400	5:2500	5:3000	5:4000	5:5000	5：6000
	5:7500								
Remark	**When CT ratios are lower than 200A, there is 1digit decimal place, when CT ratio is equal or higher than 200A, there is no decimal on the display.**								

Remark:

1, if the meter is a direct connection type, it has no CT setup interface.

2, After CT ratio setup, the energy consumption display will be reset to ZERO kWh

- Setting Passwords:



The meter will display the current password after entering the password setup interface; press the "SET" to change the password. Use "page down" and "page up" button to input new password if required. After 30 seconds the meter will save the new password you selected (Recommended for Billing or FIT applications only).

Caution:

Do not forget the password you setup.

CT Operated Meters

Please check your CT ratio programming match Current Transformers Used.

It is essential to install CT's with the correct polarity & orientation.

Reference Voltages must be taken from the correct phase.

9. Technical support

Any questions, please contact:

TEL: 0161 624 6211
www.owen-brothers.com
Email: sales@owen-brothers.com
support@owen-brothers.com