



-1-





## Content

Panel Meter Specifications	.3
Panel Meter Operation Manual	.7
Dimension	20
Wiring Diagram	21
Installation	22
Contact	24

## **OB3000** Panel Meter Specification

## **1 Safety Instruction**

#### 1.1 Information for Your Own Safety

This manual does not contain all of the safety measures for operation of this equipment (module, device) because special operating conditions, local code requirements or local regulations may necessitate further measures. However, it does contain information which must be adhered to for your own personal safety and to avoid damage to the equipment. This information is highlighted by a warning triangle with an exclamation mark or a lightning bolt depending on the severity of the warning.



### **1.2 Qualified personnel**

Installation and operation of this equipment described in this manual may only be performed by qualified personnel.

Only people that are authorized to install, connect and use this equipment and have the proper knowledge about labeling and grounding electrical equipment and circuits and can do so according to safety and regulatory standards are considered qualified personnel in the manual.

### 1.3 Use for the intended purpose

The equipment (device, module) may only be used for the application cases specified in the catalog and the user manual and only in connection with devices and components recommended and approved by Forlong.

### **1.4 Proper handling**

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

Only use isolated tools suitable for the voltages the meter is used for.

# OWEN BROTHERS



Do not connect while circuit is live (hot). Place the meter only in dry surroundings. Do not mount the meter in an explosive area or exposed to dust, mildew and/or insects. Make sure the used 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's connection clamps directly with your bare hands, with metal, blank wire or other conducting material as that will cause an electric shock and possibly cause injury. Make sure the protection cover is placed after installation.

Installation, maintenance and repair should only be done by qualified personnel.

Never break the seals to open the front cover as this might influence the functionality or accuracy of the meter, and will void all warranty.

Do not drop, or allow physical impact to the meter as there are high precision components inside that may break and render the meter measurement inaccurate.

## 2 Specifications

#### 2.1 Voltage Inputs

- 20-280 Volts Line To Neutral, 20-480 Volts Line to Line
- Universal Voltage Input
- Input Withstand Capability Meets IEEE C37.90.1 (Surge Withstand Capability)
- Programmable Voltage Range to Any PT ratio
- Supports: 3 phase 3 or 4 wires, 400/230V, 110/63V, 208/120V
- Burden: 0.36VA per phase Max at 600V, 0.014VA at 120 Volts
- Input wire gauge max (AWG 12 / 2.5mm<sup>2</sup>)

#### **2.2 Current Inputs**

- Class : (0 to 5) A, 5 Amp Nominal
- Fault Current Withstand: 100 Amps for 10 Seconds, 300 Amps for 3 Seconds, 500 Amps for 1 Second.
- Programmable Current to Any CT Ratio
- Burden 0.005VA per phase Max at 11Amps
- 5mA Pickup Current
- Pass through wire gauge dimension: 0.177" / 4.5mm
- Continuous current withstand: 20 amps for screw terminated or pass through current connections

#### **2.3 Isolation**

All Inputs and Outputs are galvanically isolated to 2500 Volts AC.



#### 2.4 Environmental Rating

Storage: (-25 to +70)° C Operating: (-10 to +65)° C Humidity: to 75% RH Non-Condensing Faceplate Rating: NEMA12 (Water Resistant) Environment : IP54 standard, IP65 optional Mounting Gasket Included

#### 2.5 Sensing Method

- RMS
- Sampling at 120+ Samples per Cycle on all channels measured readings simultaneously
- Harmonic % THD (% of Total Harmonic Distortion)

#### 2.6 Update Rate

- Watts, VAr and VA-100msec
- All other parameters-1second

#### 2.7 Power Supply

Option D2:

• (65 to 275) Volts AC and (90 to 380) Volts DC. Universal AC/DC Supply

Option D:

• 18-60VDC Burden: 10VA max.

#### 2.8 Communication Format

- 2 Com Ports (Back and Face Plate)
- RS485 Port (Through Back Plate)
- 10/100 BaseT Ethernet Modbus TCP (INP10)
- Com Port Baud Rate: (1200 to 115200)
- Com Port Address: 0-247
- 8 Bit, No parity
- Modbus RTU Protocols

#### 2.9 KYZ Pulse

- Type Form A
- On Resistance: 23-35 Ohm
- Peak Voltage: 350 VDC
- Continuous Load Current: 120 mA
- Peak Load Current: 350mA (10ms)
- Off Stat Leakage Current @ 350VDC: 1 mA

OBM

• Opto-Isolation: 3750V (6 0Hz, 1min)

## 2.10 Meter Accuracy

• kWh	Better than Class 1 per EN 62053-21 & BS 8431
• Kvarh	Better than Class 2 per EN 62053-23 & BS 8431
• kW & kVA	Better than Class 0.5 IEC 60688
• kvar	Better than Class 0.5 IEC 60688
Amps & Volts	Class 0.2 IEC 60688 (0.01In - 1.2In or 0.1Un - 1.2Un)
• PF	$\pm 0.2^{\circ}~(0.05 In-1.2 In~and~0.2 Un-1.2 Un)$
Neutral Current	Class 0.5 IEC 60688 (0.05In - 1.2In)

New Phoenix Works, Glen Trading Estate, Wellyhole Street, Oldham, Greater Manchester, United Kingdom, OL4 3BF

-6-

# **OB3000** Operation Introduction

## 1. Two key mode

Each key has two operating mode. Firstly, the key press down and up instantly. Secondly, the key press down about 2 second. The first mode, we call it short-press mode. The second one, we call it long-press mode.

#### 1.1 In measurement status, keys have the follow functions, please refer to table 1.

Key	Key mode	Function		
	Short press	Enter display volts amps picture		
× O	Short press	<ul><li>1.Picture number add 1</li><li>2.Enter display THD ,power factor and frequency picture</li></ul>		
₽ () ₽	Short press	1.Picture number sub 1 2.Enter display power picture		
E C H	Short press	Enter display energy picture		
	Long press	Enter or exit auto display status		
EO	Long press	Enter or exit Max Demand status		
P V	Long press	No function		
	Long press	Enter parameter setting status		

#### Table 1 Keys function in measurement status

-7-

OB/V

**1.2** In parameter setting status, keys have the follow functions, please refer to table 2.

Key	Key mode	Function
	Short press	Picture number sub 1
Market Ma	Short press	<ol> <li>Picture number add 1</li> <li>Set the number add 1</li> </ol>
P	Short press	<ol> <li>Picture number sub 1</li> <li>Set the number sub 1</li> </ol>
t ◀	Short press	Picture number add 1
	Long press	exit current node
M C	Long press	No function
P	Long press	No function
t ¶ m	Long press	Enter next node

 Table 2
 Keys function in parameter setting status

-8-

# OWEN BROTHERS



## 2. Display pictures

2.1 If you want to see phase volts, line volts, phase amps pictures.



Power up, you will see phase volts picture 1.

Step 1, short press



you will see line volts picture 2.

Step 2, short press **Esc**, you will see phase amps picture 3.

**2.2 If you want to see system power factor, frequency, phase power factor, volts Total Harmonic Distortion ,amps Total Harmonic Distortion pictures.** 



Power up, you will see phase volts picture 1.



-9-



P. 00000 i 00000 i <th colspan="5">2.3 If you want to see phase watts, phase var, phase VA , system power pictures.</th>	2.3 If you want to see phase watts, phase var, phase VA , system power pictures.				
Phase wattsPhase varPhase VASystem power(picture 8)(picture 9)(picture 10)(picture 11)	P-00001 -00001 -00001 -00001	9-00001 -00001 -00001 -00001	5.00001 .00001 .00001 .00001 		
(picture 8) (picture 9) (picture 10) (picture 11)	Phase watts	Phase var	Phase VA	System power	
	(picture 8)	(picture 9)	(picture 10)	(picture 11)	

Power up, you will see phase volts picture 1.



In every picture, you can see KWH energy, if you want to see Kvarh energy,



(picture 12)

-10-

**OWEN BROTHERS** METERING UK LTD

2.4 If you want to see Time-average volts, Time-average amps, Peak time-average volts, Peak time-average amps, Peak hold phase volts, Peak hold phase amps pictures.

Demand Demand Composition Co	)	Max* Demand • OLD J •
Time average volts (picture 13)	Time average amps (picture 14)	Peak time average volts (picture 15)
	Max" Max Max Max Max Max Max Max Max Max Max	
Peak time average amps	Peak hold phase volts	Peak hold phase amps
(picture 16)	(picture 17)	(picture 18)

Power up, you will see phase volts picture 1.

M

Step 1, long press	, you will see time average volts picture 13;
Stop 2 short pross	
step 2, short press	u
Step 3, short press	, you will see peak time average volts picture 15;
Step 4. short press	vou will see peak time average amps picture 16:
Step 5, short press	<b>ESC</b> , you will see peak hold phase volts picture 17;
Step 6, short press	, you will see peak hold phase amps picture 18.

-11-

EN BROTHERS ERING UK LTD

2.5 If you want to see Max system power factor and Max frequency, Min system power factor And Min frequency, Volts Sequence component, Amps sequence component picture.

Max COOO H SO.OO H SO.OO Kwh			
Max system power	Min system power	Volts Sequence	Amps sequence
factor and Max	factor And Min	component (picture	component (picture
frequency (picture 19)	frequency (picture 20)	21)	22)

Power up, you will see phase volts picture 1.

Step 1, long press , you will see time average volts picture 13;



19;

Step 2, short press , you will see Max system power factor and Max frequency picture

Step 3, short press , you will see Min system power factor And Min frequency picture 20;

Step 4 , short press , you will see Volts Sequence component picture 21;

Step 5, short press , you will see Amps sequence component picture 22;

-12-



# 2.6 If you want to see Power system demand, Min MD, Peak hold MD, Min system power, Max system power pictures.

ECONO KW ECONO Kwar Demand CONO Kwar ECONO KWA ECONO KWA ECONO KWA ECONO KWA ECONO KWA		MAX DOOD KW MAX DOOD Kwar Demand Demand Max Cooperation Kwar two Cooperation Kwa two Cooperation Kwa two Cooperation Kwar two Cooperation Kar two Cooperation Kwar two
Power system demand (picture 23)	Min Demand (picture 24)	Peak hold Demand (picture 25)
E COOOD KW E COOOD KW MIN ± COOOD Kvar 1 E COOOD KVA 1 W W W W W W W W W W W W W	E COOD KW MAX 0.000 Kwar MAX 0.000 Kwar 1 E COOD 1 E COOD KWA 1 E COOD KW 1 E COOD KW 1 E COOD KW 1 MAX 0 E COOD KWAR 1 MAX 0 E COOD 1 MAX 0 MAX 0 MA	
Min system power (picture 26)	Max system power (picture 27)	

Power up, you will see phase volts picture 1.



If you long press , you will see pictures will auto display one by one.





## 2.7 If you want to see individual harmonics, please refer to the below steps.



-14-

OBM

## 3. Setting parameter

### 3.1 Set relays status (parameter 0)

Control output relays	Output relay 1 type	Output relay 1 pulse
status(picture 30)	Pulse or level(picture 31)	width(picture 32)
Output relay 2 type	Output relay 2 pulse	
Pulse or level(picture 33)	width(picture 34)	
F		•



-15-



3.2 Set Modbus ID (parameter 1)





3.3 Set RS-485 Baud Rate (parameter 2)



long press, you can set baud rate (1200, 2400, 4800, 9600, 19200, 38400, 115200)

3.4 Set PT, CT(par <b>F</b> <b>SEL</b> <b>PL</b> <b>I</b> <b>400</b> <b>COB</b> <b>COB</b>			
Set PT primary	Set PT secondly	Set CT primary	Set CT secondly
(Parameter 3)	(Parameter 4)	(Parameter 5)	(Parameter 6)
The DT1 and he are 100	500000		

The PT1 can be set 100-500000;

The PT2 can be set 100-400;

The CT1 can be set 1-9999;

The CT2 can be set 1-10.



## 3.5 Set backlight time (parameter 7)



Backlight time can be set from 5s to 65535s.

## 3.6 Set auto display time interval (parameter 8)



Time interval can be set from 500ms to 9999ms.

#### 3.7 Clear energy KWh Kvarh



-17-



3.8 Set password (parameter 11)



## 3.9 Panel meter information (parameter 12)



3.10 System type (parameter 13)( customer can't use this function)



### 3.11 Individual Harmonic (parameter 14)



OR

3.12 Set System connect status (parameter 15)				
	F SEE F R F-d c. 15005	F SEE F-d C.150 Concerns	F SEL F-d C. 15022	
	Set phase 1 current forward	Set phase 2 current forward	Set phase 3 current forward	
F SEL PLEL Cont C. 15030 Content	F _Un 100 c.15045	F dl SP rUn Hollr c. 15055 recented		
Set meter working mode:	Set hours run (on roads)	Display hours		
3phase 4 wire				
3 phase 3 wire				

## 3.13 Set volts, amps, power period (parameter 16)



-19-

OBM

# Dimension



-20-

meter

## **Wiring Diagram**



Label in the back of the meter



-21-

# Installation



8	а	b	C	d	A		n
	u	2	~	ų	¥	1	9
<50°C	25	25	38	38	64	25	25
≥50°C	38	38	51	51	76	38	38

1. The dimension of the hole on the Panel:



 $2_{x}$  take off the four plastic clamps and install the meter into the hole:





 $3_{x}$  then install the four clamps on the meter



-23-

# OBM

## Contact

Address	Owen Brothers Metering UK Ltd			
Tel	44 161 624 6211			
Fax	0870 622 0424			
E-mail	sales@owen-brothers.com			
Website	www.owen-brothers.com			

-24-