

EM115-Mod-PO DC

Single phase MID Multi-function energy meter



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EM115-Mod-PO DC

Single phase 1 modular energy meter

45A-Modbus-S0

- MID approved with module "B" and "D" certification.
- Bidirectional energy metering 1 DIN modules, 120V, 230V 45-55Hz
- Direct metering up to 45
- Display of Voltage, Ampere, kW, PF, Hz, +kWh, -kWh,ΣkWh
- Total energy usage can be calculated via 5 different modes
- Display Modbus RTU Interface data: baud rate, Modbus id, Parity
- Reactive power and reactive energy available through interface
- S0 pulse output, transmission of measured values via pulses
- LCD display, 5 integer 1 decimal
- Clear green backlight display
- Accuracy class B according to EN50470-3
Accuracy class 1 according to IEC62053-21
- The meter is intended to be installed in a Mechanical Environment 'M1', with Shock and Vibrations of low significance, as per 2014/32/EU Directive and should be installed in Electromagnetic Environment 'E2', as per 2014/32/EU Directive



18mm



Security sealing

Import/Export
Energy Measuring

Multi-Measurements

S0 Output :
Programmable

» 1.Meter specification

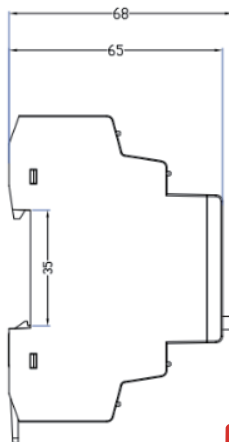
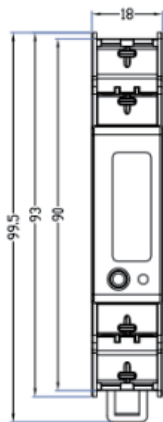
Type of measurement	Voltage, Ampe, kW, PF, Hz, + kWh, - kWh, Σ kWh
Nominal voltage(V)	230V AC
Voltage range	(88-275)V
» Current(A)	
- Iref	5A
- Itr	0.5A
- Imax	45A
- Imin	0.25A
- Ist	20mA
Power consumption of current circuits(VA)	< 0.01
Power consumption of voltage circuits(W)	< 1.3W
Current terminals flexible 1×mm ²	0-6mm ²
another terminal flexible 1×mm ²	0-2.5mm ²
RS485 cable	AWG18
» General data	
Frequency (Hz)	45-55Hz
Accuracy	B
» Pulse output	
Pulse width(ms)	80
Pulse1 constant(imp/kWh)	1000
Pulse2 constant(imp/kWh)	0.001/0.01/0.1/1
LED constant	1000
» Mechanical	
Material	ABS+PC
Weight	120g

» Environmental

Operating temperature	-25°C ~ +55°C
Storage temperature	-40°C ~ +70°C
Humidity	95% non-condensing

» Dimension

Width (mm)	18
Height (mm)	104.5
Depth (mm)	88

» 2.Dimensions

» 3.Main function

• 3.1 Measuring Function

Meter can measure import active energy,export active energy,total active energy.Import reactive and export reactive energy available through interface.

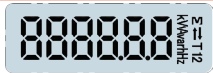
• 3.2 Electricity parameters measurement

Measured parameters from mains:

Voltage	0.5% of range maximum
Current	0.5% of range maximum
Frequency	0.2% of MID-frequency
Power factor	1.0% of unity (0.01)
Active power(W)	± 1.0% of range maximum
Reactive power(VAr)	± 2.0% of range maximum
Apparent power(VA)	± 1.0% of range maximum
Active energy(kWh)	Class B EN50470-3
Reactive energy (kvarh)	± 2.0% of range maximum

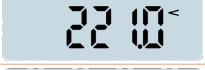
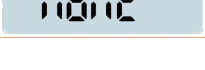
• 3.3 Display function

When the power on, the smart meter will initialize and do self-checking.

1		Full screen It will last for 3 seconds
2		Software version It will last for 3 seconds

Smart meter have two status: cycle display status and button press display .When pressing the button, will display total active energy, import active energy, export active energy, voltage, current, active power, frequency, power factor, Modbus id, baud rate , parity

- 3.4 Lcd content

1		Total active energy
2		Import active energy
3		Export active energy
4		Voltage (V)
5		Current (A)
6		Active power(W)
7		Frequency
8		Power factor (PF)
9		Modbus id (Changeable) (default 001)
10		Baud rate 1200/2400/4800/9600 bps (default 9600bps)
11		Parity

• 3.5 Communication Function

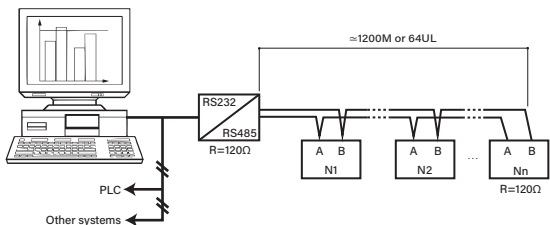
The meter provide RS485 port for remote communication. Communication parameters can be selected from the set mode.

RS485 communications transfer rates allow selected at 1200bps, 2400bps, 4800 bps ,9600bps., 19200bps, default is 9600bps.

Parity: None/Even, default is None.

Modbus address: 001-255, can be settable, default is 27.

The max quantity of meters on one RS485 main bus is 64 Units, the longest communication distance is 1.2Km.



• 3.6 Pulse output function

The meter have two pulse output. Both outputs are passive type. Pulse output 2 is configurable. Constant can be select: 0.001/0.01/0.1/1 imp/kWh, default is 1imp/kWh.

Pulse width: 60/100/200ms, Pulse output1 is fixed up with total kWh. Constant is 1000imp/kWh.

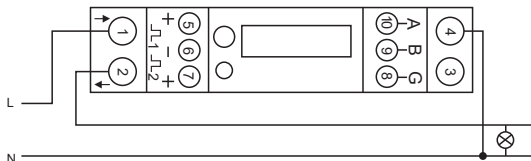
• 3.7 Programming

By holding the keys "SET" pressed for at last 3 sec., starts menu programming mode.
LCD will show



The user can program the meter parameter by sending command via RS485 port.

» 4.Wiring diagram



1/2	current in &Out
4	Neutral
5/6	S01 1000imp/kWh
7/6	S02 Configurable
8/9/10	RS485 Communication contact TX/RX (+) Terminal 10 TX/RX (-) Terminal 9 G485 (⊥) Terminal 8

» 5.Register map

• 5.1 Instantaneous values

» No	» Comments	» Read	» Write	» Bytes	» Starting address
1	Voltage	Y	N	4	0002/0010
2	Frequency	Y	N	4	0004/004E
3	Current	Y	N	4	0006/0052
4	Active power	Y	N	4	0008/0092
5	Apparent power	Y	N	4	000A/00D2
6	Reactive power	Y	N	4	000C/ 0112
7	Power factor	Y	N	4	000E/0152

• 5.2 Total energy accumulator

» No	» Comments	» Read	» Write	» Bytes	» Starting address
8	Import active energy	Y	N	4	0160/0800
9	Import reactive energy	Y	N	4	0162/0A00
10	Reserve (default 0)	Y	N	4	0164
11	Export active energy	Y	N	4	0166/0900
12	Export reactive energy	Y	N	4	0168/0B00
13	Total active energy	Y	N	4	016A/0700/0618

- 5.3 Production data and identification

» No	» Comments	» Read	» Write	» Bytes	» Starting address
14	Serial number	Y	Y	4	FF00
15	Manufacture code	Y	Y	4	FF02 (SHFQ ASCII)
16	Type code	Y	Y	2	FF04
17	Hardware version	Y	Y	2	FF05
18	Software version	Y	Y	2	FF06
19	Reference voltage	Y	N	2	FF07
20	Reference current	Y	N	2	FF08
21	SO1 constant	Y	N	2	FF09
22	SO2 output mode 0000:active energy (default) 0001:reactive energy	Y	Y	2	FF0A
23	SO2 output 0000 0.001kWh/imp 0001 0.01kWh/imp 0002 0.1kWh/imp 0003 1kWh/imp(default)	Y	Y	2	FF0B
24	SO2 pulse width 0000 60ms 0001 100ms 0002 200ms (default)	Y	Y	2	FF0C
25	Active energy measurement type 01 : Total=Import 04: Total=Export 05:Total=Import+Export 06:Total=Export-Import 09:Total=Import-Export	Y	Y	2	FF19
26	Modbus id	Y	Y	2	0524

27	Baud rate Hex(04B0) 1200bps Hex(0960) 2400bps Hex(12C0) 4800bps Hex(2580) 9600bps Hex(4B00) 19.2kbps	Y	Y	2	0525
28	Network Parity Stop 0000 None parity 0001 Even parity	Y	Y	2	0526
29	Clear energy	10	N/Y	2	0565

» 6.Declaration of Conformity

We, Shanghai Fangqiu Electric Co., Ltd
Ensure and declare that apparatus:

Single phase multi-function energy meter:
EM115-Mod-PO DC

EU-type examination certificate SGS0315
Identification number of the Notified Body: 0120.

Satisfy the appropriate requirements of the Directive 2014/32/EU 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)

» 7.Technical support

Any questions, please contact:
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