

EM115 Mod

Single Phase 1 module energy meter with Serial Modbus interface 330mV CT ac input

KEY FEATURES

Single phase metering

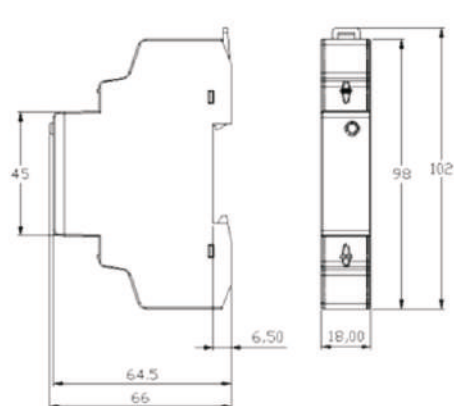
- MID approved with module B & D certification.
- Bidirectional energy metering 1 DIN modules, 230V AC 50/ 60Hz.
- Solid-core sensor & open-core sensor, 330mV ac input 100A
- Display of Voltage, Ampere, kW, PF, Hz, +kWh, -kWh, Σ kWh
- Total energy usage can be calculated via 5 different modes.
- Display 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
- Memory back-up (EEPROM)
- 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.



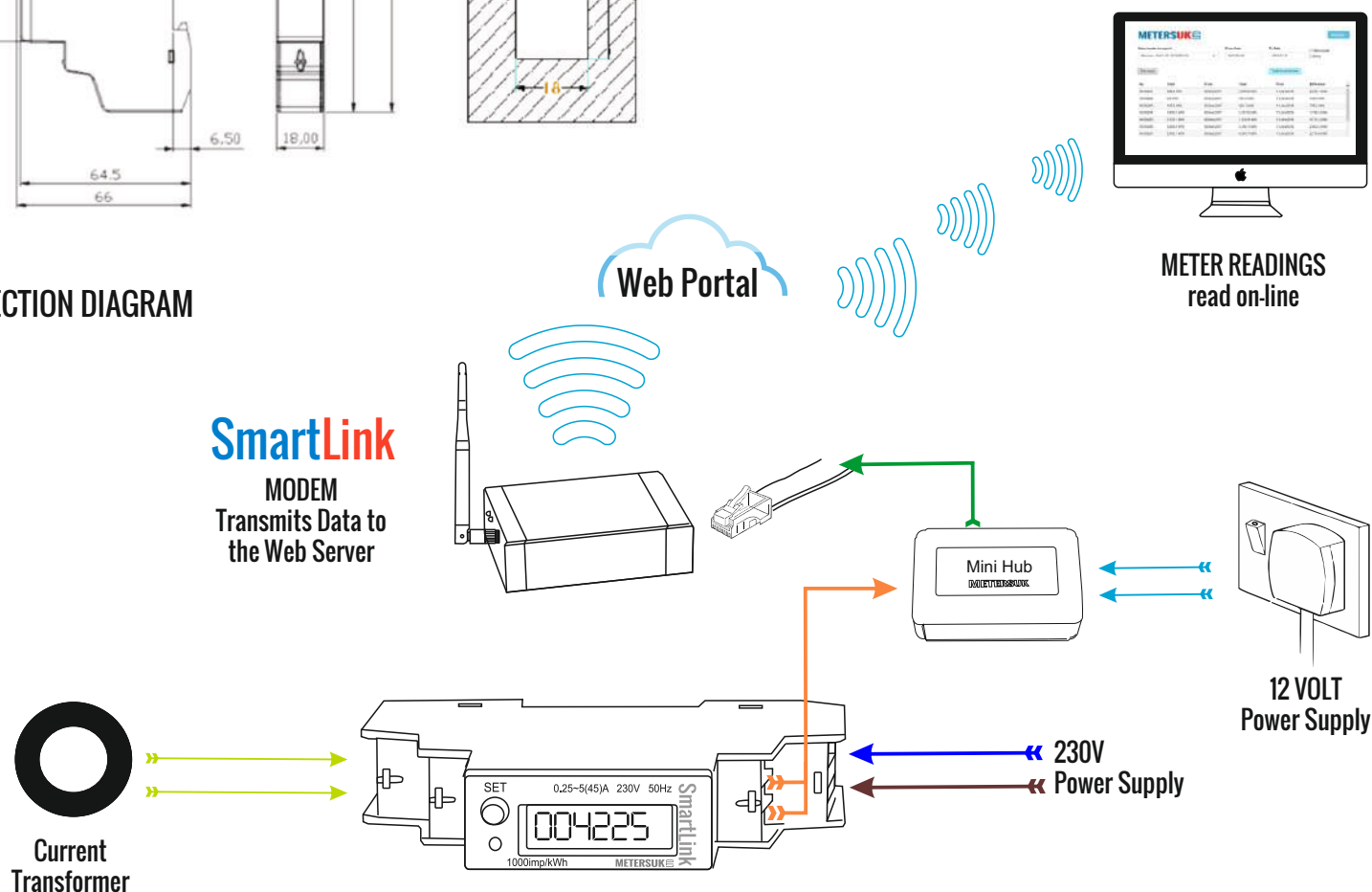
METER SPECIFICATION

Voltage/Current Inputs	
Nominal Voltage (v)	230V AC
Voltage Range	(120 - 275) v
Power Consumption	0.5W 2VA
Primary Current (A)	100A
Second input (mV)	330mV (Primary current = 100A)
RS485 cable	AWG18
Terminal flexible 1xmm ²	0 - 2.5mm ²
General data	
Frequency	50 or 60 Hz
Accuracy	Cl.1
Mechanical	
Material	ABS+PC
Weight	100g
Environmental	
Operating Temperature	-25 C - + 55 C
Storage Temperature	-40 C - + 70 C
Humidity	75% yearly average, 95% on 30 days/year, non-condensing
Dimensions	
Width x Height x Depth (mm)	18 x 104.5 x 88

DIMENSIONS AND PANEL CUT-OUT



CONNECTION DIAGRAM



3. TECHNICAL DESCRIPTION

3.1 Performance Criteria

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

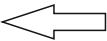
3.2 Electricity Parameter Measurement

Measured parameters from mains:

Voltage	0.5% of range maximum
Current	0.5% of nominal FS solid-core sensor
Current	1.0% of nominal FS open-core sensor
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



Full Screen
will last for 3 sec.



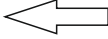
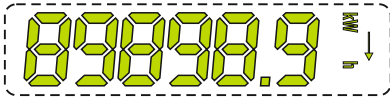
Software Version
will last for 3 sec.

Smart meter has 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

LCD CONTENT



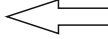
Total Active Energy



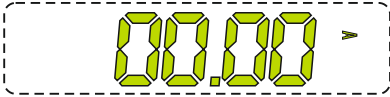
Import Active Energy



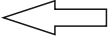
Export Active Energy



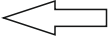
Voltage (V)



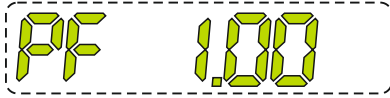
Current (A)



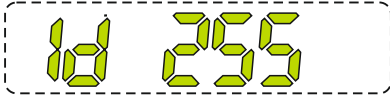
Active Power (W)



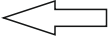
Frequency



Power Factor (PF)



Modbus id



Baud Rate (ie. 1200bps)



Parity (default : None)

3.4 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, 4800bps, 9600bps.,19200bps, default is 9600bps.

Parity: None/Even, default is None.

Modbus address: 001—255, default is 001

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

3.5 Pulse output function

The meter have two pulse output. Both outputs are passive type.

Pulse output 2 is configurable.

Constant can be selected: 0.001/0.01/0.1/1 imp/kWh or imp/kvarh, default is 1imp/kWh.

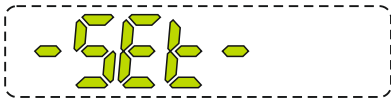
Pulse width: 60/100/200ms.

Pulse output1 is fixed up with total kWh. Constant is 1000imp/kWh

3.6 Programming

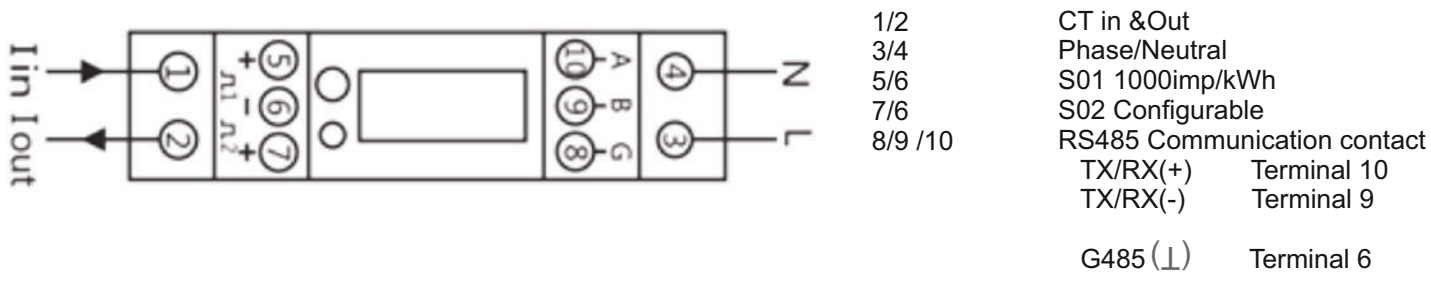
By holding the keys “SET” pressed for at last 3 sec., starts menu programming mode.

LCD will show:



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

4 WIRING DIAGRAM



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

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		164
11	Export Active Energy	Y	Y	4	0166/0900
12	Export Reactive Energy	Y	Y	4	0168/0A00
13	Total Active Energy	Y	N	4	016A/0700/0618

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: kWh 0001: kvarh	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

Production Data and Identification

No.	Comments	Read	Write	Bytes	Starting Address
24	SO2 Plus Width 0000 60ms 0001 100ms 0002 200ms (default)	Y	Y	2	FF0C
25	Active Energy Measurement Type	Y	Y	2	FF19 01 : Total = Import 04 : Total = Export 05 : Total = Import + Export 06 : Total = Export - Import 09 : Total = Import - Export
26	Modbus id	Y	Y	2	0524
27	Baud Rate	Y	Y	2	0525
28	Network Parity Stop	Y	Y	2	0526
29	Clear Energy	N	Y	2	0565

10. TECHNICAL SUPPORT

Any questions, please contact: