selec

EM2M-1P-C-100A
Operating Instructions

OP639-V01

PRODUCT PROFILE

SPECIFICATIONS

DISPLAY - 1 Row of 7 Digits
- LCD Display with backlight

LCD INDICATIONS
- ⇌ - Communication in progress
- **MD** - Maximum Demand of Power
- **IP** - Import Energy
- **EP** - Export Energy

LED INDICATIONS
- **INT** - Integration of energy

WIRING INPUT
1Ø-2wire

RATED INPUT VOLTAGE
230V AC (±20%)

FREQUENCY RANGE
50 Hz & 60 Hz

RATED INPUT CURRENT
Ib : 10A, Imin : 0.5A, Imax : 100A

DISPLAY UPDATE TIME
1 sec for all parameters

DISPLAY SCROLLING
Auto / Manual (Programmable)

POWER CONSUMPTION
Less than 8VA

ENVIRONMENTAL CONDITIONS
- Indoor use
- Altitude up to 2000 meters
- Pollution degree II

Temperature - Operating : -10°C to 55°C
- Storage : -20°C to 75°C

Humidity - Upto 85% (non - condensing)

MOUNTING - Din Rail mounting

WEIGHT - 150gms

OUTPUT - Pulse Output : Voltage Range : External 24V DC Max
- Current Capacity : 100mA Max

COMMUNICATION
RS485 MODBUS RTU

ORDER CODE INFORMATION

Product	Outputs	Certification
EM2M-1P-C-100A	RS485 (Modbus RTU) & Pulse	CE

SERIAL COMMUNICATION

Interface standard and protocol	RS485 AND MODBUS RTU
Communication address	1 to 255
Transmission Mode	Half duplex
Data types	Float and Integer
Transmission distance	500 Meter maximum
Transmission speed	9600 &19200 (in bps)
Parity	None, Odd, Even
Stop bits	1 or 2

RESOLUTION

Energy	0.01k

ACCURACY

Measurement	Accuracy
Voltage V_{L-N}	±0.5% of Full scale
Current	±0.5% of Nominal
Power Factor	±0.01 of Full range
Frequency	±0.1% of Full range
Active Power	1.00 % of Full range
Reactive Power	1.00 % of Full range
Apparent Power	1.00 % of Full range
Active Energy	Class1
Reactive Energy	Class1
Apparent Energy	Class1
Demand Active Power	1.00 % of Full range
Demand Reactive Power	1.00 % of Full range
Demand Apparent Power	1.00 % of Full range

⚠ SAFETY PRECAUTIONS

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating person as well as the instrument.

If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment.

- Do not use the equipment if there is any mechanical damage.
- Ensure that the equipment is supplied with correct voltage.

⚠ CAUTION :

1. Read complete instructions prior to installation and operation of the unit.
2. Risk of electric shock.
3. The equipment in its installed state must not come in close proximity to any heating sources, oils, steam, caustic vapors or other unwanted process by products.

WIRING GUIDELINES

⚠ WARNING :

1. To prevent the risk of electric shock, power supply to the equipment must be Kept OFF while doing the wiring Arrangement.
2. Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct.
3. Use lugged terminals.
4. To reduce electromagnetic interference use of wires with adequate ratings and twists of the same in equal size shall be made with shortest connections.
5. Layout of connecting cables shall be away from any internal EMI source.
6. Cable used for connection to power source, must have a cross section of 25mm^2(13 to 11AWG ; 75^{0}C(min)). These wires shall have current carrying capacity of 100A.
7. Copper cable should be used (Stranded or Single core cable).
8. Before attempting work on device, ensure absence of voltages using appropriate voltage detection device.

INSTALLATION GUIDELINES

⚠ CAUTION :

1. This equipment, being buit-in type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the user end after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. The equipment shall not be installed in environmental condition other than those mentioned in this manual.
4. Connector screw must be tightened after installation.

CONFIGURATION

There are 2 dedicated keys (Scroll & Enter) to enter into configuration Menu / change settings.

- The settings should be done by a professional, after going through this user manual and after having understood the application situation.

For the configuration setting mode :

- Press the (Scroll & Enter) keys for 3 sec to enter or exit from the Configuration menu.
- In online mode, press Scroll key to move on to next page.
- In config mode, press Enter key to change the parameters value/page and Scroll key to enable the editing and save the changes in configuration.
- Press the Enter key to check Serial no.
- Press the Enter key for 3sec for communication Lock.

NOTE :

- Above 70A current pulse duration should be set to 0.05sec.

Config. page	Function	Range or Selection	Factory Setting
1	Password	0000 to 9998	1000
2	Change Password	No / Yes	No
2.1	New Password	0000 to 9998	0001
3	Demand interval method	Sliding / Fixed	Sliding
4	Demand interval duration	1 to 30	15
5	Demand interval length	1 to 30 min	1
6	POP	Kwh - Total/IP/EP, Kvarh -Total/IP/EP	Total varh
7	Pulse Weight	1/10/100/1000	1000
8	Pulse Duration	0.05 to 2 sec	0.1
9	Slave Id	1 to 255	1
10	Baud rate	9600,19200 bps	9600 bps
11	Parity	None, Odd, Even	None
12	Stop Bit	1 or 2	1
13	Backlight	0 to 7200	0
14	Factory default	No / Yes	No
15	Reset	No / Yes	No
15.1	Password	0001 to 9999	1001
15.2	Reset kwh	No / Yes	No
15.3	Reset kvarh	No / Yes	No
15.4	Reset kvah	No / Yes	No
15.5	Reset Max Demand	No / Yes	No

PULSE OUTPUT DESCRIPTION

Pulse Output	Type	Description	Pulse width
POP1	Fixed 1000 Kwh Pulses	Kwh	0.05 to 2 sec
POP2	Configurable 1/10/100/1000 Pulses	Kwh - Total/IP/EP kvarh - Total/IP/EP	0.05 to 2 sec

FRONT PANEL DESCRIPTION

FOR EM2M-1P-100A-C

KEY PRESS	ONLINE PAGE DESCRIPTION	
Press	1st screen	Displays Total Active Energy
	2nd screen	Displays Import Active Energy
	3rd screen	Displays Export Active Energy
	4th screen	Displays Total Reactive Energy
	5th screen	Displays Import Reactive Energy
	6th screen	Displays Export Reactive Energy
	7th screen	Displays Apparent Energy
	8th screen	Displays Active Power
	9th screen	Displays Reactive Power
	10th screen	Displays Apparent Power
	11th screen	Displays Voltage L-N
	12th screen	Displays Current
	13th screen	Displays Power Factor
	14th screen	Displays Frequency
	15th screen	Displays Max Demand Active Power
	16th screen	Displays Max Demand Reactive Power
	17th screen	Displays Max Demand Apparent Power

AUTOMATIC / MANUAL

Long press scroll key to toggle between Automatic/Manual mode.

MODBUS REGISTER ADDRESSES LIST

Readable parameters for Communication [Length (Register) : 2; Data Structure : Float]

Address	Hex Address	Parameter
30001	0x01	Total Active Energy
30003	0x03	Import Active Energy
30005	0x05	Export Active Energy
30007	0x07	Total Reactive Energy
30009	0x09	Import Reactive Energy
30011	0x0B	Export Reactive Energy
30013	0x0D	Apparent Energy
30015	0x0F	Active Power
30017	0x11	Reactive Power
30019	0x13	Apparent Power
30021	0x15	Voltage L-N
30023	0x17	Current
30025	0x19	Power Factor
30027	0x1B	Frequency
30029	0x1D	Max Demand Active Power
30031	0x1F	Max Demand Reactive Power
30033	0x21	Max Demand Apparent Power

Energy rollover counter addresses : Energy rollover counter will increment when energy is roll over from 99999.99 to 0.
[Data Structure: Integer]

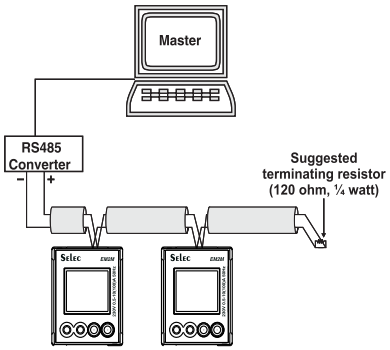
30150	0x96	Total Kwh
30151	0x97	Import Kwh
30152	0x98	Export Kwh
30153	0x99	Total Kvarh
30154	0x9A	Import Kvarh
30155	0x9B	Export Kvarh
30156	0x9C	Kvah

MODBUS REGISTER ADDRESSES LIST

Readable/Writable parameters for Communication

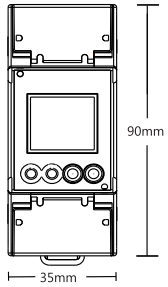
Address	Hex Address	Parameter	Range		Length (Register)	Data Structure
			Min value	**Max value**		
40001	0x01	Password	0	9998	1	Integer
			Min value	**Max value**		
40002	0x02	Slave ID	001	255	1	Integer
			Value	**Meaning**		
40005	0x05	Demand interval method	0x0000	Sliding	1	Integer
			0x0001	Fixed	1	Integer
			Min value	**Max value**		
40006	0x06	Demand interval length	01	30	1	Integer
			Min value	**Max value**		
40007	0x07	Demand interval duration	01	30	1	Integer
			Value	**Meaning**		
40008	0x08	POP	0x0000	Total wh	1	Integer
			0x0001	Total varh	1	Integer
			0x0002	IP wh	1	Integer
			0x0003	EP wh	1	Integer
			0x0004	IP varh	1	Integer
			0x0005	EP varh	1	Integer
			Value	**Meaning**		
40009	0x09	Pulse weight	0x0000	1	1	Integer
			0x0001	10	1	Integer
			0x0002	100	1	Integer
			0x0003	1000	1	Integer
			Min value	**Max value**		
40010	0x0A	Pulse duration	0.05	2.00	1	Integer
			Value	**Meaning**		
40011	0x0B	Baud rate (bps)	0	9600	1	Integer
			1	19200	1	Integer
			Value	**Meaning**		
40012	0x0C	Parity	0X0000	None	1	Integer
			0X0001	Odd	1	Integer
			0x0002	Even	1	Integer
			Value	**Meaning**		
40013	0x0D	Stop bit	0x0001	1	1	Integer
			0x0002	2	1	Integer
			Min value	**Max value**		
40014	0x0E	Backlight OFF (sec.)	1	7200	1	Integer
40015	0x0F	Factory Default	1	Set to factory setting range	1	Integer
40041	0x29	Reset kWh	1	Reset Active energy	1	Integer
40042	0x2A	Reset kVArh	1	Reset Rective energy	1	Integer
40043	0x2B	Reset Kvah	1	Reset Apparent energy	1	Integer
40044	0x2C	Reset Max Demand	1	Reset Max demand power	1	Integer

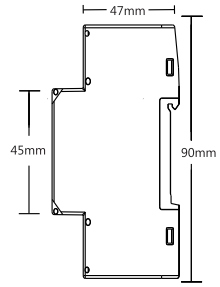
CONNECTION DIAGRAM FOR COMMUNICATION



Contact sales for PC based monitoring software to communicate with the meters.

MECHANICAL DIMENSIONS

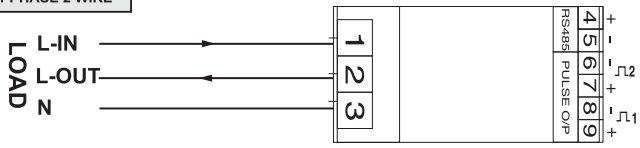




TERMINAL CONNECTIONS

TYPICAL WIRING DIAGRAM

1 PHASE 2 WIRE



(Specifications subject to change as development is a continuous process.)

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