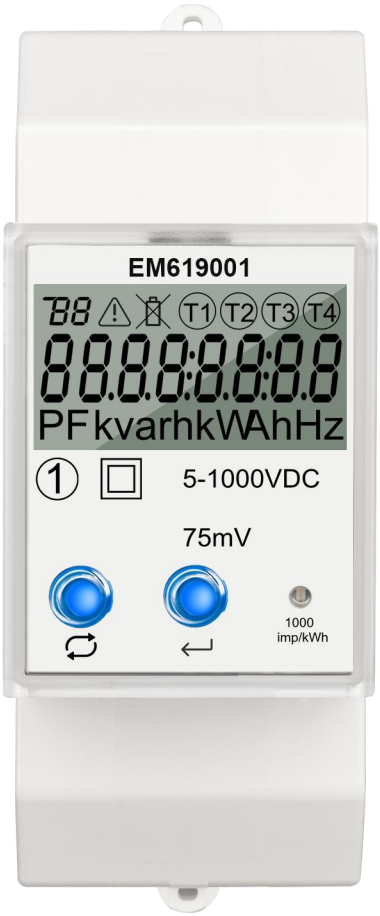
Bi-directional DC Metering RS485 meter

EM619001& EM619002 User Manual



Warnings

Important Safety Information is contained in the Maintenance section. Familiarize yourself with this information before attempting installation or other procedures.

Risk of Danger: These instructions contain important safety information. Read them before starting installation or servicing of the equipment.

Caution: Risk of Electric Shock

1. Brief Introduction

The EM619001/EM619002 is a DC metering device which adopts shunt measurement,external connection shunt (prepared by the customer). It has the features of RS485 communication (DLT645/Modbus protocol compatible), simple data reading, din-rail type installation, great reliability, compact size,beautiful appearance etc.Built-in battery supports multiple billing functions and time. Overload alarm, internal auxiliary relay, it is used to control external relays and realize over-current cut off circuits. It is widely used in new energy metering systems, such as charging piles and solar power generation systems.

2. Main Functions

- Supports RS485 communication: used for parameter setting, data read; DLT645 protocol is compatible with Modbus protocol.
- DC measurement: external shunt sampling, high measurement accuracy; can measure DC power, current, voltage.
- Alarm function: over-current alarm, when CT1 value when the current exceeds the meters, alarm occurs, the LCD will display a warning sign, and at the same time the LCD back light red (over-current alarm LCD display Code 01, over current threshold of 250A)
- Display: LCD backlight display, support various parameter display, energy data and instantaneous parameters.
- Auxiliary relay signal output (can control external relay for overcurrent cut-off).
- Single auxiliary relay for over-current cut-off signal output (can control external relays to cut off circuits)
- Firmware upgrade: supports RS485 local upgrade.

3. Technical Parameters

3.1 General Requirements

Model Number	EM619001	EM619002
Voltage Input	DC 5V~1000V (Note: The meter can ensure the maximum input voltage is 1200V when accuracy class 1.0 . Exceeding 1500V may damage the meter, try to work within the specified voltage range.)	
Self-powered Power	AC 85~265V / DC 85~265V	DC 9~60V
Current	Shunt connection, primary current up to 2,000A, access meter signal: 75mV	

Current Accuracy	0.5%
Voltage Accuracy	0.5%
Active Power Accuracy	1.0%
Active Accuracy	Class 1.0
Constant	1,000imp/kwh (default) 1.2 times the max.voltage and current(A), the pulse width is 1.2ms, corresponding to the existing setting
Display	LCD 6+2
Power Consumption	≤8VA ≤0.4W
Temperature	-25~70℃
Humidity	≤95%
AC Withstand Voltage	4,400V/min
Impulse Withstand Voltage	6.4kV - 1.2/50μS waveform
Battery	Yes
Multi-tariff	Yes

3.2 Communication

- Support RS485 communication, DLT645/MODBUS dual protocol, the meter can read the meter parameters through RS485 communication or set the meter parameters
- The default baud rate is 115200bps
- The default value for the RS485 serial port is 115200-8-EVEN-1

3.3 Accuracy

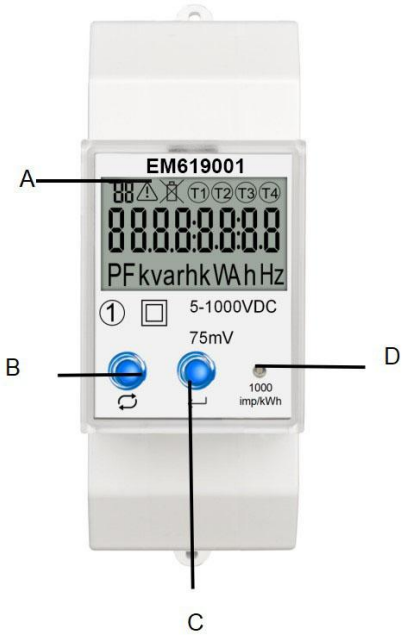
Voltage	0.5%
Current	0.5%
Active power	1%
Active energy	1%

3.4 Environment

Working temperature	-25 ~ 70℃
Storage&Transportation temperature	-25~70℃
Reference temperature	23 ± 2℃
Relative humidity	≤75% (Non Condensing) ,non condensing
Preheating time	10s
Vibration	10Hz to 50Hz,IEC 60068-2-6,2g

*Maximum operating and storage temperatures are in the context of typical daily and seasonal variataion.

4. Product Appearance



Appearance Description	
Index	Description
A	LCD display
B	Short press the left button to turn to the next page, and long press to enter the setting page
C	Short press the right button to go back to the previous page, and long press to enter the next level
D	LED pulse indicator light
Meter Case Material	
Base	PC+ABS alloy material
Top cover	PC+ABS alloy material
Terminal cover	PC+ABS
Hook	ABS

5. LCD Display

5.1 Full Display Introduction

Index	Description
1	Function indicate
2	Alarm indicate (this meter does not have)
3	Low battery indicate (this meter does not have)
4	Tariff indicate
5	LCD 8 digits display
6	Measurement unit

5.2 Button Introduction

1) Short press the left button to turn to the next page, and long press to enter the setting page.

2) Short press the right button to go back to the previous page, and long press to enter the next level.

Note: Press and hold the left button to enter the settings page. The specific settings page is as follows for reference.

Setting up major pages	Page No.	Content	Default Parameter	Illustrate
	P1	Baud Rate	115200	Setting the baud rate 115200
	P2	Communication check bit	Even	Set the communication check bit to even parity
	P3	Mode	1	1: Forward +Reverse (Unidirectional metering) 0: Forward -Reverse (Bi-directional metering)

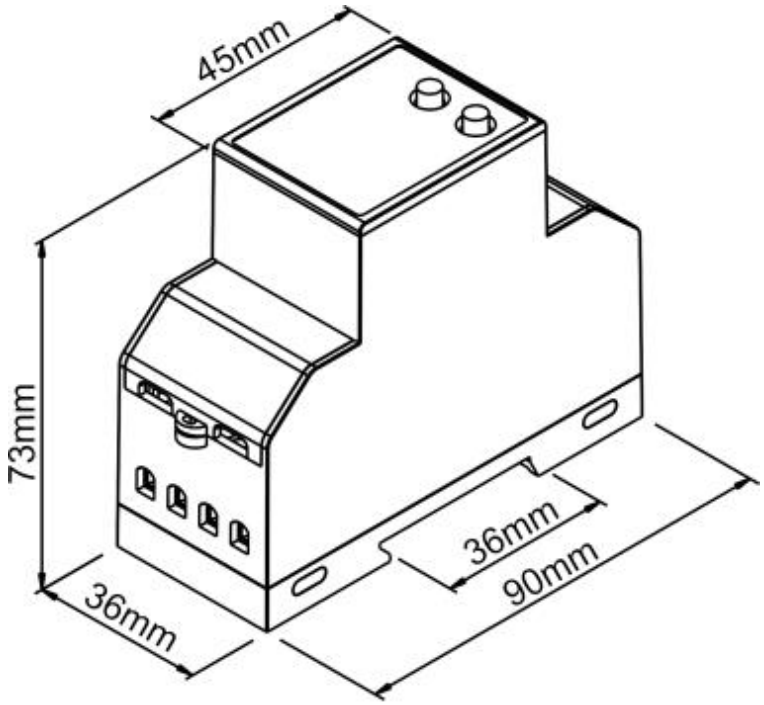
	P4	Modbus address	1	1~247：Set the modbus address
	P5	Communication stop bit	1	1：One stop bit 2：Two stop bits
	P6.1 ~P6. 6	DLT address	000	0~255，Set one byte per small page, long press the right button to switch the address segment
	P7	Total energy can be cleared	000000.00 kWh	Short press the right button to clear the energy
	P8	Shunt parameter	0200A	Setting shunt parameter
	P9		0.075V	

5.3 LCD Display Content

Page Number	Content	Unit	Display Format	Note
First Major (1st level)				
1	Total active energy	kWh	6+2 000000.00	
2	T1 Active Energy	kWh	6+2 000000.00	
3	T2 Active Energy	kWh	6+2 000000.00	
4	T3 Active Energy	kWh	6+2 000000.00	
5	T4 Active Energy	kWh	6+2 000000.00	
6	Voltage	V	4+2 0000.00	
7	Current	A	4+3 0000.000	
8	Power	W	7+1 0000000.0	
Long press the right button to enter the next level				
1	Serial number/the first 8 bits of the DLT address		00000000	
2	Serial number/the last 4 bits of the DLT address		0000	
3	Version number		1.1.0.1	
4	CT1parameter		75 0200	Default 75mV 200A
5	Impulse constant		0000	Default 1000imp/kWh
6	Baud rate		000000	Default 115200
7	Parity check		EVEN	
8	CRC Display		crc c200	
9	Date		YYMMDDWW	
10	Time		HHMMSS	
Long press the right button in the second level to enter the third level				
1	Resettable energy	kWh	6+2 000000.00	On this page, hold down the

				right button and long press the left button to clear.
2	Forward active energy	kWh	6+2 000000.00	
3	Reverse active energy	kWh	6+2 000000.00	

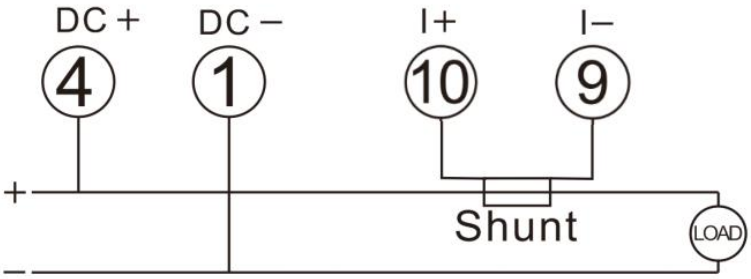
6. Overall Dimension



7. Wiring Diagram

EM619001

EM619002



Interface port:

1&4：measurement voltage（5-1000VDC）；

5&6：auxiliary relay output port；

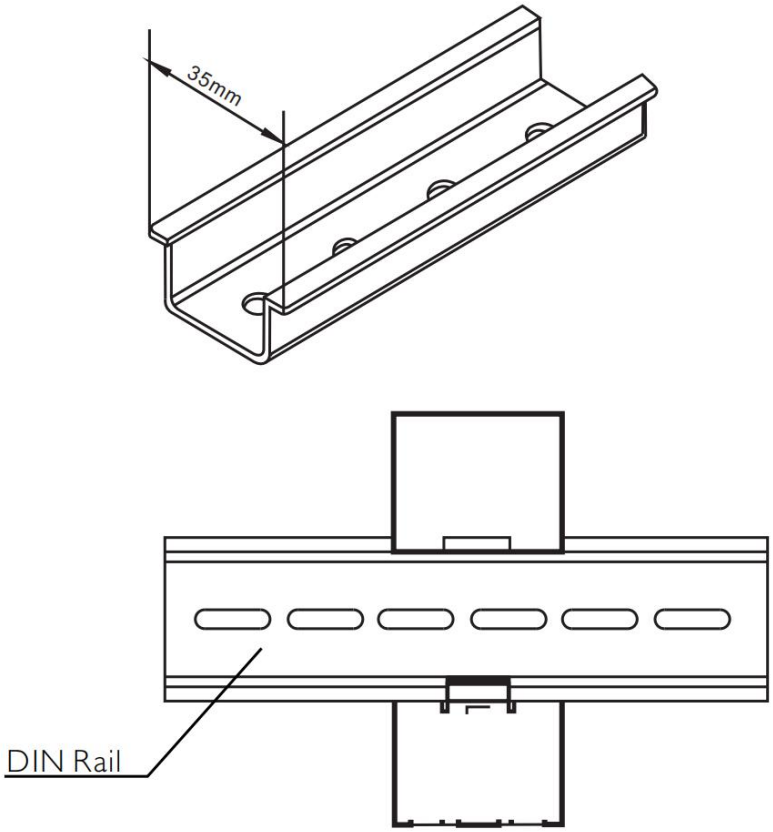
9&10：external shunt sampling interface ports（default 75mV）；

13&14：auxiliary power supply interface ports（85-265V AC/DC）；

21&20：RS485interface ports

8. Installation Instructions

35mm standard din-rail installation.



9. Transportation & Storage

The energy meter shall not be subject to severe impact during transportation and storage, and shall be transported and stored in accordance with GB13384-2008 General Technical Conditions for Packaging of Instruments and Meters. The energy meter shall be stored in the original package. The temperature range of the storage environment is 0-40C, the relative humidity is not more than 85%, and there is no corrosive gas in the air. The energy meters shall be stored in the warehouse and placed on the bench. The stacking height shall not exceed 10 boxes. After unpacking, the stacking height of single packaged energy meters shall not exceed 5 layers.

10. Quality Assurance

10.1 Calculation method of warranty period:

Warranty is handled according to the commercial invoice issued by our company, and

the time is 18 months from the date when the meter is shipped from the warehouse, minus the maintenance time and delivery time for no spare parts.

10.2 Warranty coverage

10.2.1 When the user fully follows up the transportation, storage, installation and application of the electric energy meter, and the company's conditions of sealing integrity (in the case of no printing and dis-assembly), the electric energy meter that does not meet the quality requirements and valid evidence (For example, desks, certificate photos, feedback documents from customers' local users, relevant government departments, documents, etc.) should be provided by the customer.

10.2.2 We will repair, replace or return the meter in the following cases:
no demonstration and no prior explanation;
Does not meet the implementation standards indicated on the product or its packaging;
(If the standard on the product/package is required by the customer, but does not meet the company's product implementation standard, the customer should make a corresponding responsibility commitment)
Does not meet the quality status indicated by product instructions, physical samples, etc.

Unqualified meters should be determined in consultation with the user. Generally, we will repair or replenish in the next order. Special circumstances shall be determined through consultation between the two parties.
note: The quality guarantee is not applicable. If there is no valid invoice, the evidence corresponding to the quality problem of the order cannot be provided, and the damage caused by force majeure or the warranty beyond the validity period, but can

be recovered for repair (transportation and other related costs need to be borne by the customer)

11. Technical Support

Users' manual is mainly used to guide users to better utilize this series of meter. If unclear please contact with us at any time, we will give you a satisfactory answer.

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