

SDM-530C

THREE PHASE FOUR WIRE ENERGY METER WITH RS485 MODBUS RTU
(SEVEN MODULE)



User manual

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1.1 Safety instructions

Information for Your Own Safety

This manual does not contain all of the safety measures operating the equipment (module, device) for different conditions and requirements. However, it does contain information which you must know for your own safety and to avoid damages. This information is highlighted by a warning triangle indicating the degree of potential danger.



Warning

This means that failure to observe the instruction can result in death, serious injury or considerable material damage.



Caution

This means hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

Qualified personnel

Operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in this manual means person who are authorized to commission, start up, ground and label devices, systems and circuits according to safety and Regulatory standards.

Use for the intended purpose

The equipment (device, module) may only be used for the application specified in the catalogue and the user manual, and only be connected with devices and components recommended and approved by the Eastron Electronic Instruments.

Proper handling

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

- ✧ Use only insulating tools.
- ✧ 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 expose the meter to dust, mildew and insects.
- ✧ Make sure the 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 connecting clamps directly with metal, blank wire and your bare hands as you may get electrical shock.
- ✧ Make sure the protection cover is placed after installation.
- ✧ Installation, maintenance and reparation should only be done by qualified personnel.
- ✧ Never break the seals and open the front cover as this might influence the function of the meter, and will cause no warranty.
- ✧ Do not drop, or allow strong physical impact on the meter as the high precisely components inside may be damaged.

Disclaimer

We have checked the contents of this publication and every effort has been made to ensure that the descriptions are as accurate as possible.

However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors contained in the information given. The data in this manual is checked regularly and the necessary corrections are included in subsequent editions. We are grateful for any improvements that you suggest.

Subject to technical modifications without notice.**1.2 Foreword**

The Eastron SDM-530C is a DIN rail three phase four wire energy meter with RS 485 Modbus RTU protocol. Output is LCD displayed based on kWh and the data can be transported by isolated RS485. The meter is provided with a non-volatile memory system that ensures that the readings are not lost or altered when power off.

The SDM530C has both direct connection version and CT connection version. The direct connection version meter measures up to 100A load. And the CT connection type request an external current transformer with 5A secondary input.

Although we produce the SDM-530C meter according to IEC 62053-21 and our quality inspection is very accurate there might always be a possibility that your product shows a fault or failure for which we do apologize. Under normal conditions your product should give you years of benefit and pleasure. In case there is a problem with the energy meter you should contact your dealer immediately. All energy meters are sealed with a special seal. Once this seal is broken there is no possibility to claim for warranty. Therefore NEVER open an energy meter or break the seal of the energy meter. The warranty time is 6 months, after installation, and only valid for construction faults.

1.3 Performance criteria:

Operating humidity	≤ 85%
Storage humidity	≤ 95%
Operating temperature	-20°C - +50°C
Storage temperature	-30°C - +70°C
International standard	IEC 62053-21 IEC61010
Accuracy class	0.5 or 1.0
Protection against penetration of dust and water	IP51
Insulating encased meter of Protective class	II

1.4 Meter specifications:

Meter type	SDM-530C
Nominal voltage (Un)	230/400V AC (3~) 110/220V AC
Operational voltage	
Insulation capabilities:	
- AC voltage withstand	4KV for 1 minute
- Impulse voltage withstand	6KV – 1.2μS waveform

Basic current (I _b):	
CT type	5 A
Directly connect	10A
Maximum rated current (I _{max})	
CT type	6A
Directly connect	100A
Operational current range	0.4% I _b - I _{max}
Over current withstand	30I _{max} for 0.01s
Operational frequency range	50Hz ±10%
Internal power consumption	≤2W / 10VA per phase
Test output flash rate (PULSE LED)	
CT type	1600imp/kWh
Directly connect	400imp/kWh
Test pulse output rate (pins 8 & 9)	
CT type	1600imp/kWh
Directly connect	400imp/kWh
CT Changing-Ratio	27 ratios optional
Phase voltage missing indicator (Phase A,B & C LED)	LED turn on when the phase voltage is missing
Consumption indicator (PULSE & SO LED)	Flashing at load running
Communication indicator	Flashing at communication running
Data communication port	RS485 and far infrared
Data save	The data can be stored more than 20 years when power off

1.5 RS485 communication specifications:

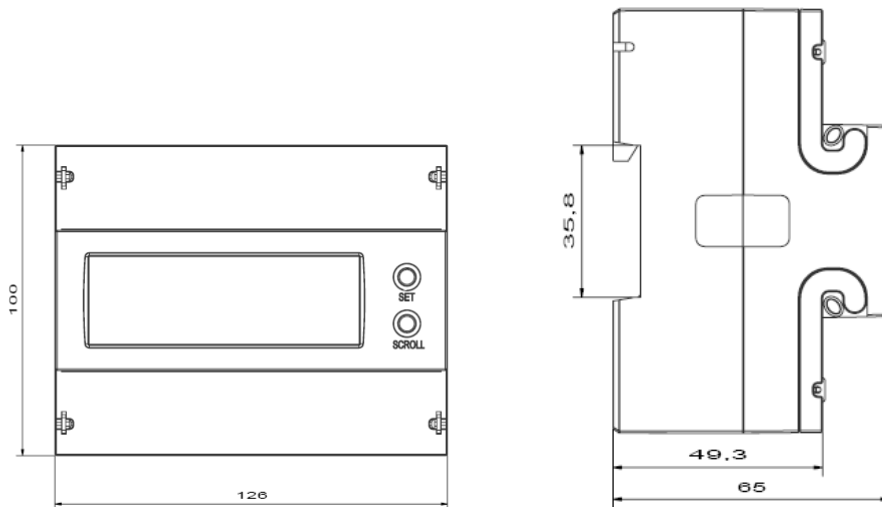
Bus type	RS485
protocol	MODBUS RTU with 16 bit CRC
baud rate	1200(default) 2400, 4800, 9600,
Address range	0-247 user settable
Bus Loading	32 meters per bus (recommend)
Rage	1200m
Protocol	see part 2.2

Infrared communication specifications:

infrared wavelengths	900- 1000nm
baud rate	1200bps(default),
communication distance	5m
communication angle	-15°~+15°
protocol	MODBUS RTU with 16 bit CRC

1.6 Material and Dimensions

Front panel	inflammable PC
Cover	inflammable PC
Base	inflammable PC
Clamp	Nylon
Button	Rubber



Height	100 mm
Width	126 mm
Depth	65 mm
Weight	0.7 Kg (net)

1.7 Installation

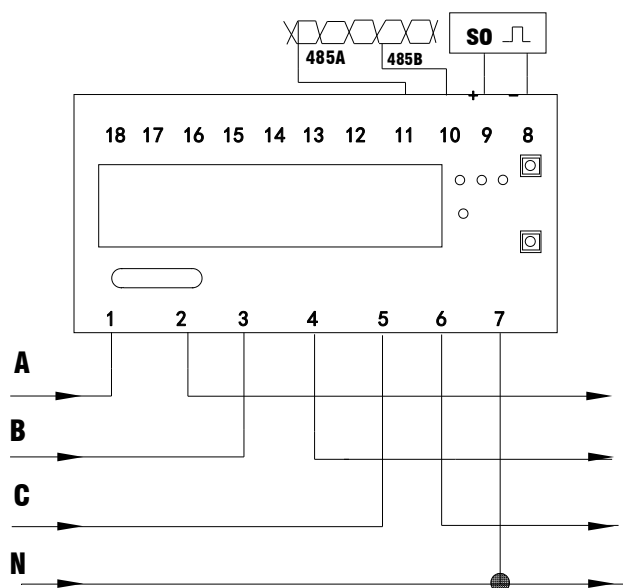
⚠ CAUTION
<ul style="list-style-type: none"> ◆ Turn off all the power before working on it. ◆ Always use a properly rated voltage sensing device to confirm that power is off.

⚠ WARNING
<ul style="list-style-type: none"> ◆ Installation should be performed by qualified personnel familiar with applicable codes and regulations. ◆ Use isolated tools to install the meter. ◆ Fuse or thermal cut-off or single-pole circuit breaker can't be fitted on the supply line and not the neutral line.

- ◇ We recommend that the connecting wire which is used to connect the meter to the outside circuit should be sized according to local codes and regulations for the amp city of the circuit breaker or over current device used in the circuit.
- ◇ An external switch or a circuit-breaker should be installed on the inlet wire, which will be used as a disconnection device for the meter. And there it is recommended that the switch or circuit-breaker is near the meter so that it is more convenience for the operator. The switch or

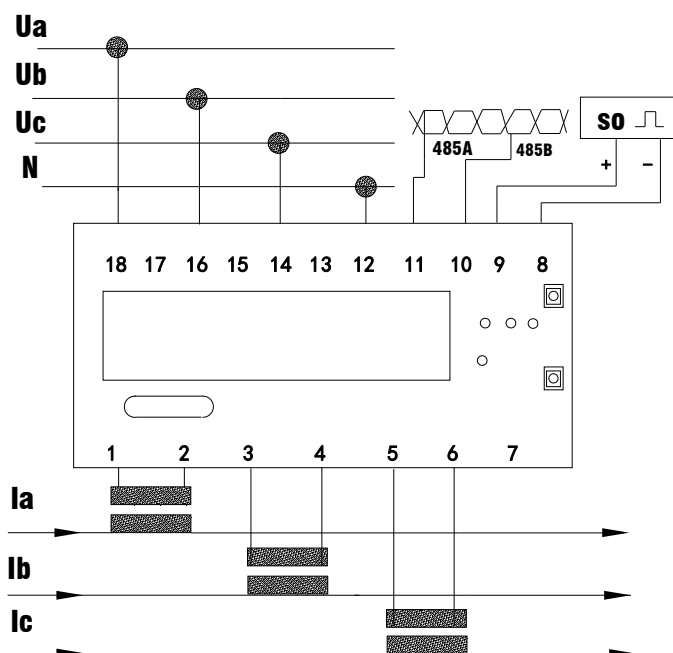
- circuit-breaker should comply with the specifications of the buildings electrical design and all local regulations.
- ✧ An external fuse or thermal cut-off which will be used as a over current protection device for the meter must be installed on the supply side wire, and it is recommended that the over current protection device is near the meter so that it is more convenience for the operator. The over current protection device should comply with the specifications of the buildings electrical design and all local regulations.
 - ✧ This meter can be installed indoor directly, or in a meter box which is waterproof outdoor, subject to local codes and regulations.
 - ✧ To prevent tampering, secure the meter with a padlock or a similar device.
 - ✧ The meter has to be installed against a wall which is fire resistant.
 - ✧ The meter has to be installed in a good ventilated and dry place.
 - ✧ The meter has to be installed in a protection box when placed in dangerous or dusty environment.
 - ✧ The meter can be installed and used after being tested and sealed with a letter press printing.
 - ✧ The meter can be installed on a 35mm DIN rail or direct on a meter board with screws.
 - ✧ The meter should be installed in an available height so that it is easy to read.
 - ✧ When the meter is installed in an area with frequent surges due to e.q. thunderstorms, welding machines, inverters etc, protect the meter with Surge Protection Devices
 - ✧ After finishing installation, the meter must be sealed to prevent tampering.
 - ✧ Connection of the wires should be done in accordance with the underneath connection diagram.

A、 Direct connect type:



1/2	Ia	IN/OUT	
3/4	Ib	IN/OUT	
5/6	Ic	IN/OUT	Neutral wire
8/ 9		Test pulse output contact	

10/11 RS485 communication contact

B、CT connect type

1/2	Ia IN/OUT
3/4	Ib IN/OUT
5/6	Ic IN/OUT
18/16/14/12	Phase A/B/C/N
8/ 9	Test pulse output contact
10/11	RS485 communication contact

1.8 Operating**Consumption indication**

On the SDM-530C'S front panel, there are four LED, in which three LED are for three phase voltage and another one for impulse. The constant of the impulse is shown on the nameplate of the meter.

Reading the meter

The SDM-530C energy meter is equipped with 6+1 or 5+2 LCD display, which is used as recording consumption and can't be reset to zero. The number system is based on units of 10. And unit is kWh. Another way through RS485 and PC software or HHU (hand held unit) unit can read power consumption. For HHU information, please contact sales@eastrongroup.com

Pulse output

SDM-530C DIN rail energy meter is equipped with a pulse output which is fully separated from the inside circuit. That generates pulses in proportion to the measured energy. They are test pulse output (pins 8 & 9). Usually, the test pulse output is used as testing accuracy or reading purpose in close quarters.

The test pulse output is a polarity dependant, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage (U_i) should be 5-27V DC, and the maximum input current (I_{max}) should be 27mA DC. To connect the impulse output, connect 5-27V DC to connector 9 (anode), and the signal wire (S) to connector 8 (cathode). The meter pulses is indicated on the front panel.

Communication port

SDM530C has equipped a far infrared port and a RS485 port, we can program the meter's operation data or reading via these 2 ports. The communication protocol conforms with MODBUS RTU protocol.

Far infrared communication port

The far infrared communication port is on the left of LCD screen. It is infrared wireless communication port. The hand-held programmer can directly communicate the data between the meter and this port.

The data transmission speed is 1200bps(default)

The communication distance is not less than 5m.

Rs485 output

RS485 communication port is between the meter terminal 11 and 10.

It is a synchronization wire port. Installing a software in PC, via RS485 adapter

Connecting the terminal 11 and 10, PC can communicate with the meter immediately.

LEDs

There are four LEDs on the front panel, they are marked with A B C and imp/kwh. A B C are phase voltage missing indicators , and imp/kwh is pulse output indicator.

	Yellow	Green	Red
A-phase power	Does not shine	Bright	Bright
B-phase power	Bright	Does not shine	Bright
C-phase power	Bright	Bright	Does not shine
Only AB power	Does not shine	Does not shine	Bright
Only AC power	Does not shine	Bright	Does not shine
ABC together on the power	Does not shine	Does not shine	Does not shine