

SDM120 SERIES -M/-MB/-PLS

45A DIRECT CONNECT AND CT CONNECT



User Manual V1.8

- Measures kWh, kVarh, kW, kVar, kVA, PF, Hz, dmd, V, A, etc.
- Bi-directional measurement IMP & EXP
- Two pulse outputs
- RS485 Modbus RTU / Mbus
- Din rail mounting 35mm
- 45A direct connect / CT Connect
- Better than Class 1 accuracy

1. Introduction

This document provides operating, maintenance and installation instructions of SDM120 series. The unit measures and displays the characteristics of single phase two wire application. It provides voltage, current, power, frequency, power factor and energy information. SDM120 series have both direct connect types and CT operated types. The direct connect type can work with direct load up to 45A. The CT type including 5A input, 100mA/mV input and 40mA input versions. Two pulse outputs and 1 remote communication port are provided.

Model table:

Model	Current Input	Communication	MID
SDM120M	0.25-5(45)A	RS485 Modbus	●
SDM120MB	0.25-5(45)A	M-Bus EN13757-3	●
SDM120P	0.25-5(45)A	---	●
SDM120CTM	0.25-5(6)A CT	RS485 Modbus	●
	40mA CT	RS485 Modbus	●
	100mA CT	RS485 Modbus	●
SDM120CT-MV	100mV CT	RS485 Modbus	●
SDM120CTMB	0.25-5(6)A CT	M-Bus EN13757-3	●
SDM120CTP	0.25-5(6)A CT	---	●

2. Specifications

2.1 General Specifications

Voltage AC (Un)	230V
Voltage range	176-276V AC
Current input	Refer to the model table
Power consumption	<2W/10VA
Frequency	50/60Hz (50Hz only for MID version)
AC voltage withstand	4KV for 1 minute
Impulse voltage withstand	6KV-1.2uS waveform
Overcurrent withstand	30Imax for 0.01s(SDM120 45A)
Pulse output 1	20Imax for 0.5s(SDM120CT)
Pulse output 2	1000/100/101imp/kWh/kVarh(configurable)
	1000imp/kWh(non-configurable)

Display
Max. Reading

LCD with white backlit
99999.9kWh/kVarh (SDM120 45A)
99999.9kWh/kVarh (SDM120 CT)

2.2 Accuracy

Voltage	0.5% of range maximum
Current	0.5% of nominal
Frequency	0.2% of mid-frequency
Power factor	1% of Unity
Active power	1% of range maximum
Reactive power	1% of range maximum
Apparent power	1% of range maximum
Active energy	Class 1 IEC62053-21
	Class B EN50470-1/3 (MID version only)
Reactive energy	Class 2 IEC 62053-23

2.3 Environment

Operating temperature	-25°C to +55°C/-40°C to +70°C(optional)
Storage and transportation temperature	-40°C to +70°C
Reference temperature	23°C±2°C
Installation category	CATIII
Relative humidity	0 to 95%, non-condensing
Altitude	0 to 2000m
Warm up time	3s
Mechanical environment	M1
Electromagnetic environment	E2
Degree of pollution	2

2.4 Mechanics

Din rail dimensions	18x118x64 (WxHxD) DIN 43860
Mounting	DIN rail 35mm
Ingress protection	IP51 (indoor)
Material	Self-extinguishing UL94V-0

3 Display

Start-up Screens

When it is powered on, the meter will initialize and do self-checking.

1	88888888	Full screen
2	020 105	Software version In kind prevail
3	000478	Total active energy(kWh)

After the self-checking program, the meter screen will display the total active energy (kWh)

* Note: For the MID version of SDM120CTM, SDM120CTMB and SDM120CTP, the CT1 can be set only once. Before you set the CT1, please check the ratio of the CT connected to the meter. For example, if the CT is 100/5A, please set CT1 to 100.

Scroll Display by Button

There is a button on the front of the meter. After initialization and self-checking program, the meter display the measured values. The default page is total kWh. If the user wants to check other information, he needs to press the scroll button on the front panel.

	Click the button, the LCD display will scroll the measurements.
	Keep pressing the button for 3 seconds, the meter will enter set-up mode.

1	000478	Total active energy(kWh)
1-1	000245	Import active energy(kWh)
1-2	000232	Export active energy(kWh)
2	2198	Voltage (V)
3	20.18	Current (A)
4	22102	Active power (W)
5	F 5000	Frequency (F)
6	PF 100	Power factor (PF)
7	1d 001	Modbus address or Mbus primary address
8	b 2400	Baud rate
9	P r t y n	Parity Option: None/Even/Odd Default: none
10	CT0 100	CT 1 (SDM120CT* only) Primary current 1A-9999A Default: 5 * Note: For the MID version, the CT1 can be set only once.
11	CT0005	CT2 (SDM120CT* 5A versions only) Secondary current 1A or 5A, Default: 5 (For mV or mA input version, CT2 is fixed and not shown on display)
12	M 0000	M-Bus secondary address High (M-Bus version only)
13	L 0000	M-Bus secondary address Low (M-Bus version only)
14	020 105	Software version (In kind prevail)

The display of each model:

SDM120M:

Total kWh → Import kWh → Export kWh → Voltage → Current → Active power
→ Frequency → Power factor → Address → Baudrate → Parity → Software version

SDM120MB:

Total kWh → Import kWh → Export kWh → Voltage → Current → Active power
→ Frequency → Power factor → Address → Baudrate → Parity → Secondary
address high → Secondary address low → Software version

SDM120P:

Total kWh → Import kWh → Export kWh → Voltage → Current → Active power →
Frequency → Power factor → Software version

SDM120CTM 5A:

Total kWh → Import kWh → Export kWh → Voltage → Current → Active power →
Frequency → Power factor → Address → Baudrate → Parity → CT 1 → CT 2
→ Software version

SDM120CT-MV/SDM120CTM 40mA/100mA:

Total kWh→Import kWh→Export kWh→Voltage→Current→Active power→
Frequency→Power factor→Address→Baudrate→Parity→CT 1→Software version

SDM120CTMB:

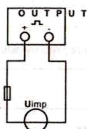
Total kWh→Import kWh→Export kWh→Voltage→Current→Active power→
Frequency→Power factor→Address→Baudrate→Parity→CT 1→CT 2→
Secondary address high→Secondary address low→Software version

SDM120CTP:

Total kWh→Import kWh→Export kWh→Voltage→Current→Active power→
Frequency→Power factor→CT 1→CT 2→Software version

4. Communication**4.1 Pulse output**

The meter is equipped with 2 pulse outputs, which are fully isolated from the inside circuit. That generates pulses in proportion to the measured energy. The pulse outputs are polarity dependent, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage shall be 5-27V DC, and the maximum input current shall be 27mA DC.



ATTENTION: Pulse output must be fed as shown in the wiring diagram on the left. Scrupulously respect polarities and the connection mode. Opto-coupler with potential-free SPST-NO Contact.

Contact range: 5~27VDC
Max. current input: 27mA DC

4.2 Pulse output 1 (Not for SDM120P or SDM120CTP)

Pulse output 1 is configurable. The pulse output 1 can be set to generate pulses to represent total / import / export kWh or kVAh. The pulse constant can be set to generate 1 pulse per: 0.001 (default) 0.01/0.1/kWh/kVAh. Pulse width: 200/100/ 60ms (default).

4.3 Pulse output 1 (SDM120P and SDM120CTP only)

Pulse output 1 is non-configurable. It is fixed to export kWh. The constant is 1000imp/kWh.

4.4 Pulse output 2

Pulse output 2 is non-configurable. It is fixed to total kWh. The constant is 1000imp/kWh. The Pulse width: 60ms

4.5 RS485 output for Modbus RTU (SDM120M and SDM120CTM/CT-MV only)

The meter provides a RS485 port for remote communication. Modbus RTU is the protocol applied. For Modbus RTU, the following RS485 communication parameters can be configured from the set-up menu.

Baud rate: 1200, 2400, 4800, 9600, 19200bps(optional)

Parity: NONE/EVEN/ODD

Stop bits: 1 or 2

Modbus Address: 1 to 247

4.6 M-Bus communication EN13757-3 (SDM120MB and SDM120CTMB only)

The meter provides an M-Bus port for remote communication. The protocol fully comply with EN13757-3. The following communication parameters can be configured via M-Bus communication.

Baud rate: 300,600,1200, 2400, 4800, 9600bps

Parity: NONE/EVEN/ODD

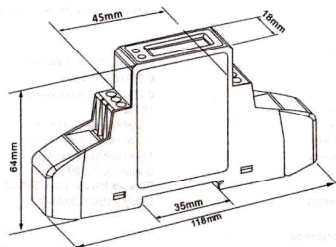
Stop bits: 1 or 2

M-Bus network primary address: nnn - 3 digits number from 001 to 250

M-Bus network secondary address: 00 00 00 00 to 99 99 99 99

Please contact us for the detailed Modbus/M-Bus communication protocol.

sales@eastrongroup.com

5. Dimensions**6. Installation****6.1 Safety instruction****Information for your own safety**

This manual does not contain all of the safety measures for operation of the equipment(module,device),because special operating conditions, and local code requirements or regulations may necessitate further measures. However, it does contain information which must be read for your personal safety and to avoid material damages. This information is highlighted by a warning triangle and is represented as follows, depending on 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.

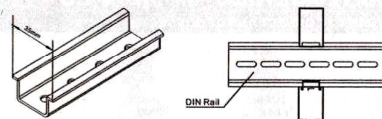
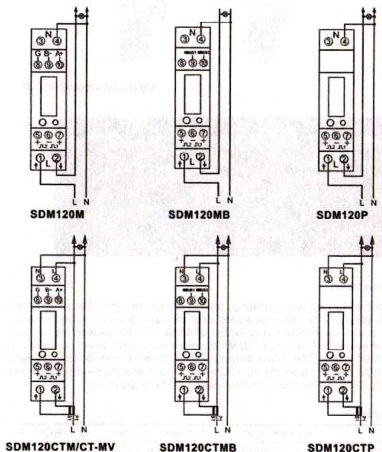
Qualified personnel

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.

Proper handling

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 EASTRON.

- 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 used 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 connect the meter to a 3 phase - 400VAC - network.
- Do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you may get an electrical shock.
- Make sure the protection cover is placed after installation.
- Installation, maintenance and repair should only be done by qualified personnel.
- Never break the seals and open the front cover as this might influence the functionality of the meter, and will avoid any warranty.
- Do not drop, or allow physical impact to the meter as there are high precision components inside that may break.

6.2 Installation**6.3 Wiring diagram**

Terminals Capacity	COMM / Pulse	0.5~1.5mm²
	Load	2.5~10mm²
Screw Torque	COMM / Pulse	0.2Nm
	Load	1.5Nm

7. Declaration of Conformity (for the MID approved meters only)

We Zhejiang Eastron Electronic Co., Ltd. declares under our sole responsibility as the manufacturer that the single phase multifunction electrical energy meter SDM120 series correspond to the production model described in the EU-type examination certificate and the requirements of the Directive 2014/32/EU. Type examination certificate number 0120/SGS0141. Identification number of the Notified Body: 0598.

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