

# SDM120-M(MB)

*Smart Single Phase Energy Meter*



***USER MANUAL***  
***2026 V1.1***

## Statements

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Eastron reserves the right to amend the product specifications in this manual without prior notice. Before placing an order, please contact our company or local agent to get the latest specifications.

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## Version History

| Version | Date       | Changes                                                               |
|---------|------------|-----------------------------------------------------------------------|
| 1.0     | 2025-04-15 | Initial issue                                                         |
| 1.1     | 2025-06-04 | Modify wiring guide parameters and certification accuracy parameters. |

## Risk Information

### 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. These information are 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.

### 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.
- ✧ Designed to be mounted inside of switchboards or cabinet on DIN rail.
- ✧ This device must have a suitable sized Circuit Breaker feeding the Multi Function Energy Meter so it

does not exceed the maximum rated current.

- ✧ The supply wiring of this device shall be suitable sized cable to match the installed circuit breaker.
- ✧ A Disconnection Device (Circuit Breaker) should be installed close to the Multi Function Energy Meter.
- ✧ The Disconnection Device shall be marked as the Disconnection Device for the Multi Function Energy Meter.

#### **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.

## Chapter 1. Introduction

### 1.1 Product Introduction

SDM120-M and SDM120-MB are Eastron's new-generation single phase smart energy meters. The meter measures and displays the characteristics of single phase two wire (1p2w), including voltage, frequency, current, power, active and reactive energy, imported or exported. Energy is measured in terms of kWh, kVAh. Maximum demand current can be measured over preset periods of up to 60 minutes.

The meter is Max. 45A direct connected and does not need to connect with external current transformers(CT). An M-Bus communication port is available on the SDM120-MB and an RS485 communication port is available on the SDM120-M for remote data transmission.

### 1.2 Product Characteristics

- Bi-directional measurement IMP & EXP
- M-bus parameters (only for SDM120-MB)
- RS485 Modbus RTU (only for SDM120-M)
- Multi-parameters measurement

#### Measurements:

- Phase voltage: V
- Current: A
- Active power: W
- Frequency: Hz
- Power factor: PF
- Active energy: Ep\_imp (import active energy), Ep\_exp (export active energy), Ep\_total (total active energy)
- Reactive energy: Eq\_total (total reactive energy)

#### Setup:

- M-bus parameters (only for SDM120-MB)
- RS485 Modbus RTU (only for SDM120-M)

## Chapter 2. Technical Parameters

### 2.1 Technical Parameters

|                                   |                              |
|-----------------------------------|------------------------------|
| Voltage AC (Un)                   | 230V AC                      |
| Voltage Range                     | 100 - 277V AC                |
| Current Input                     | 0.15-5(45)A                  |
| Starting Current (Ist)            | 0.02A                        |
| Transition Current (Itr)          | 0.5A                         |
| Over Current Withstand            | 30I <sub>max</sub> for 0.01S |
| Frequency Rating Value            | 50/60Hz                      |
| AC Voltage Withstand              | 4KV/1min                     |
| Impulse Voltage Withstand         | 6kV – 1.2/50μS waveform      |
| Voltage Circuit Power Consumption | ≤ 2W/10VA                    |
| Current Circuit Power Consumption | ≤0.05VA                      |
| Display                           | LCD with white backlit       |
| Max. reading                      | 999999 kWh/kVArh             |

### 2.2 Mechanical Characteristics

|                                        |                                        |
|----------------------------------------|----------------------------------------|
| Net Weight                             | ≈77g                                   |
| IP Degree of Protection<br>(IEC 60529) | IP51 front display<br>IP20 whole meter |
| Dimensions (DxHxW)                     | 64*118*18mm                            |
| Mounting                               | DIN Rail 35mm                          |
| Material of Meter Case                 | Self-extinguishing UL 94 V-0           |
| Mechanical Environment                 | M1                                     |

### 2.3 Performance Criteria

|                       |                             |
|-----------------------|-----------------------------|
| Operation Humidity    | ≤90% Non-condensing         |
| Storage Humidity      | ≤95% Non-condensing         |
| Operating Temperature | -40℃~+70℃                   |
| Storage Temperature   | -40℃~+80℃                   |
| Pollution Degree      | 2                           |
| Altitude              | ≤2000m                      |
| Vibration             | 10Hz to 50Hz, IEC 60068-2-6 |

### 2.4 Electromagnetic Compatibility

|                             |                 |
|-----------------------------|-----------------|
| Electrostatic Discharge     | IEC 61000-4-2   |
| Immunity to Radiated Fields | IEC 61000-4-3   |
| Immunity to Fast Transients | IEC 61000-4-4   |
| Immunity to Impulse Waves   | IEC 61000-4-5   |
| Conducted Immunity          | IEC 61000-4-6   |
| Immunity to Magnetic Fields | IEC 61000-4-8   |
| Immunity to Voltage Dips    | IEC 61000-4-11  |
| Radiated Emissions          | EN55032 Class B |

|                     |                 |
|---------------------|-----------------|
| Conducted Emissions | EN55032 Class B |
|---------------------|-----------------|

## 2.5 Safety

|                                              |         |
|----------------------------------------------|---------|
| Over-voltage Category                        | CAT III |
| Installation Category                        | CAT III |
| Insulating Encased Meter of Protective Class | II      |

## 2.6 Accuracy

| Parameters      | Accuracy                                        |
|-----------------|-------------------------------------------------|
| Voltage         | ±0.2%                                           |
| Current         | ±0.2%                                           |
| Frequency       | ±0.05%                                          |
| Power Factor    | ±0.005                                          |
| Active Power    | ±0.5% (10%I <sub>b</sub> ~I <sub>max</sub> )    |
| Reactive Power  | ±2% (10%I <sub>b</sub> ~I <sub>max</sub> )      |
| Apparent Power  | ±0.5%10%I <sub>b</sub> ~I <sub>max</sub> )      |
| Active Energy   | Class 0.5 IEC62053-21<br>Class C EN50470-3:2022 |
| Reactive Energy | Class 2 IEC 62053-23                            |

## 2.7 Outputs

### 2.7.1 Communication

SDM120-MB 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:

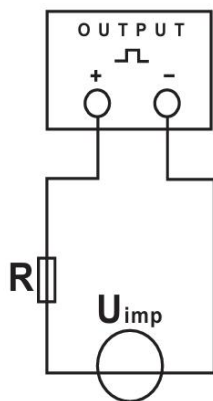
|                                 |                                                                  |
|---------------------------------|------------------------------------------------------------------|
| Baud rate                       | 600, 1200, 2400(default), 4800, 9600bps                          |
| Parity                          | NONE/ ODD / EVEN(default)                                        |
| Stop bits                       | 1 or 2                                                           |
| M-Bus network primary address   | 001 to 250                                                       |
| M-Bus network secondary address | 00 00 00 00 to 99 99 99 99<br>(default: the last 8 digits of SN) |

For SDM120-M, the following RS485 communication parameters can be configured from the Set-up menu:

|                        |                                          |
|------------------------|------------------------------------------|
| Bus Type               | RS485                                    |
| Communication Protocol | Modbus RTU                               |
| Baud Rate              | 2.4k/4.8k/9.6k(default)/19.2k /38.4k bps |
| Address Range          | 001 to 247                               |
| Bus Load               | 64 PCS                                   |
| Communication Distance | 1000m                                    |
| Parity Bit             | none(default)/ odd / even                |
| Stop Bit               | 1 or 2                                   |
| Data Bits              | 8                                        |

### 2.7.2 Pulse Output

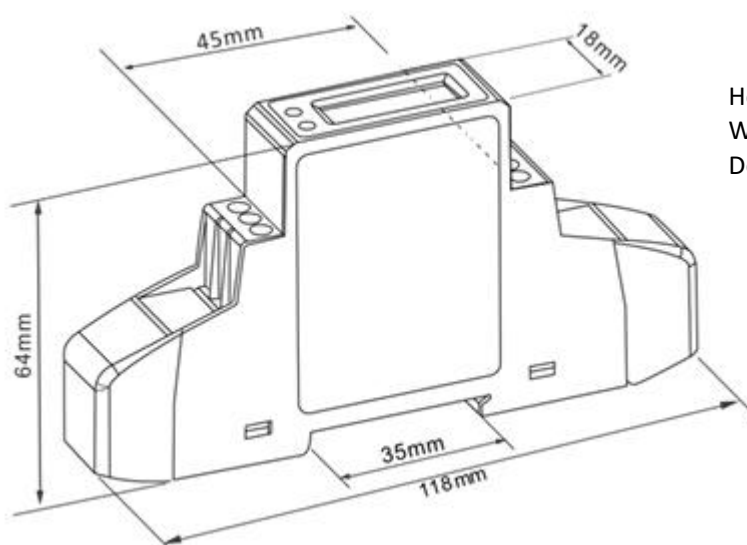
The meter is equipped with two pulse outputs, which is fully isolated from the inside circuit. That generates pulses in proportion to the measured energy. The pulse output is polarity dependent, passive transistor output requiring an external voltage source for correct operation. For this external voltage 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

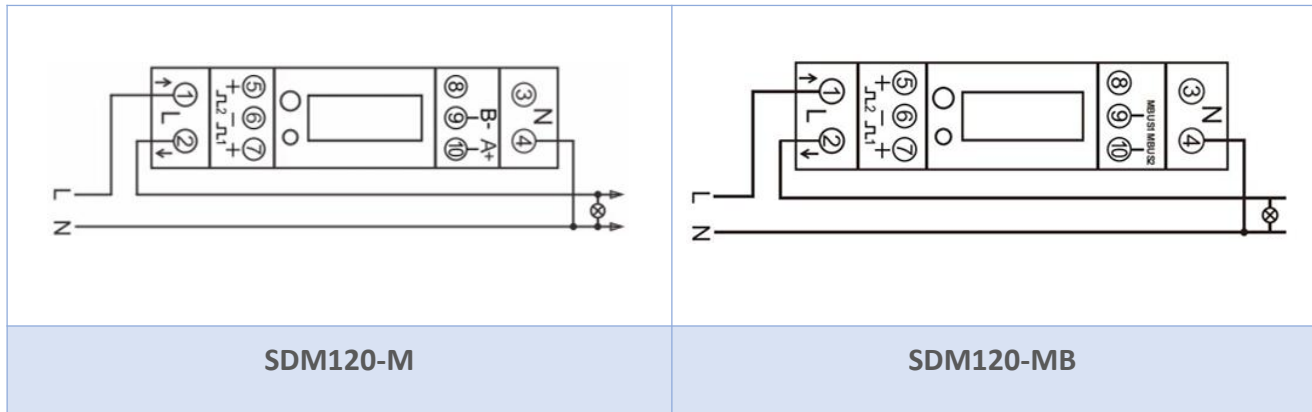
| Pulse outputs type            | Two independent channels of optocoupler passive pulse outputs |                                                                                                                                |
|-------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Pulse output 1 (configurable) | Type                                                          | Import Active Energy, Export Active Energy, Import Reactive Energy, Export Reactive Energy;<br>Default: Export Reactive Energy |
|                               | Constant                                                      | 0.001, 0.01, 0.1, 1 kWh/kVAh per imp<br>Default: 0.001 kVAh/imp                                                                |
|                               | Width                                                         | 200, 100, 60mS<br>Default: 60mS                                                                                                |
| Pulse output 2 (fixed)        | Type                                                          | Total kWh                                                                                                                      |
|                               | Constant                                                      | 1000 imp/kWh                                                                                                                   |
|                               | Width                                                         | 100mS                                                                                                                          |

### 2.8 Dimensions



Height: 118mm  
 Width: 18mm  
 Depth: 64mm

## 2.9 Wiring Diagram



### Wiring Guide

|                 |                        |                                     |
|-----------------|------------------------|-------------------------------------|
| Terminal<br>①~④ | Measurement Connection | Screw Connection                    |
|                 | Strip Length           | 9-10mm                              |
|                 | Screw                  | M4                                  |
|                 | Rigid/Supple           | 2.5-10mm <sup>2</sup>               |
|                 | Tightening Torque      | 2.5Nm                               |
|                 | Model                  | PH2                                 |
| Terminal<br>⑤~⑩ | Measurement Connection | Screw Connection                    |
|                 | Strip Length           | 5-6mm                               |
|                 | Rigid/Supple           | 0.2-1.5mm <sup>2</sup> (22 ~ 14AWG) |
|                 | Tightening Torque      | 0.4Nm                               |
|                 | Model                  | PH0                                 |

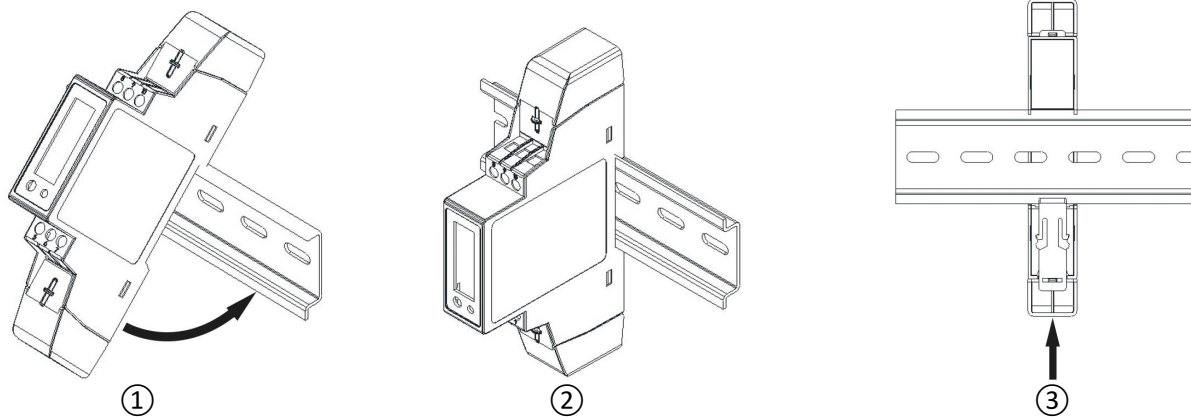
## Installation

Step 1: Select a 35mm-wide DIN rail, Pull down the back-end clip on the meter to unlock the mounting mechanism.

Step 2: Align Upper Slot with DIN Rail. Position the upper slot of the meter's DIN rail groove onto the DIN rail, ensuring full contact (see Figure 1).

Step 3: Following the direction indicated in Figure 1, engage the lower slot of the DIN rail groove onto the DIN rail until audibly seated (see Figure 2).

Step 4: Push up the back-end clip to lock the meter firmly onto the DIN rail (see Figure 3).



## Chapter 3. Operation

### 3.1 Installation Display

|                                                                                     |                                                                                                                        |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|    | <p>The first screen lights up all display segments and can be used as a display check.</p>                             |
|    | <p>The second screen show software version.</p>                                                                        |
|   | <p>The third screen show program number.<br/>Note: the actual display might be different with the left one here.</p>   |
|  | <p>Cyclic redundancy check code-high bytes<br/>Note: the actual display might be different with the left one here.</p> |
|  | <p>Cyclic redundancy check code-low bytes<br/>Note: the actual display might be different with the left one here.</p>  |

### 3.2 Button Functions

|                                                                                     |                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>◆ In measurement mode:<br/>Short press: switch display screen<br/>Long press: enter setup mode</li> <li>◆ In setup mode:<br/>Short press: next page or increase value<br/>Long press: setup parameters</li> </ul> |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

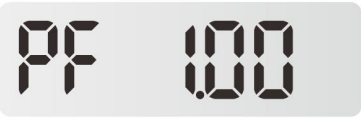
### 3.3 Measurements

Each successive pressing of the  button selects a new range:

Can be viewed by pressing the button:

Total active energy in kWh → Imported active energy in kWh → Exported active energy in kWh → Total reactive energy in kVarh → Phase to neutral voltage → Current of phase → Instantaneous active power KW → Frequency → Power factor → address → Baud rate → Parity bit → Stop bit → Secondary address-high address → Secondary address-low address

|                                                                                     |                                |
|-------------------------------------------------------------------------------------|--------------------------------|
|    | Total active energy in kWh     |
|   | Imported active energy in kWh  |
|  | Exported active energy in kWh  |
|  | Total reactive energy in kVarh |
|  | Phase to neutral voltage       |

|                                                                                     |                               |
|-------------------------------------------------------------------------------------|-------------------------------|
|    | Current of phase              |
|    | Instantaneous active power KW |
|    | Frequency                     |
|  | Power factor                  |
|  | Address                       |
|  | Baud rate<br>(For SDM120-M)   |
|  | Baud rate<br>(For SDM120-MB)  |

|                                                                                     |                                                   |
|-------------------------------------------------------------------------------------|---------------------------------------------------|
|    | Parity bit                                        |
|    | Stop bit<br>(For SDM120-M)                        |
|    | Secondary address-high address<br>(For SDM120-MB) |
|  | Secondary address-low address<br>(For SDM120-MB)  |

### 3.4 Setup Mode

The user need keep pressing the button  for 3 seconds to enter into the Set-up Mode. Some menu items, such as address, require to input the digit numbers for setting while the others, such as baud rate, require selection from a number of menu options.

1. Long press button to enter into the setup mode;
2. Short press the button to select the setting menu.
3. Long press the button again to access to the edit interface. Short press button to select the required digits or selections from the menu option. After setting, please remember to wait 3 seconds to confirm the setting;
4. If it is the digit number setting, after setting the first digit and waiting 3s, the next digit will flash and repeat the 3<sup>rd</sup> option until all the settings are done.
5. short press the button to move to the next setting page. If without any operation, waiting for 10 seconds to return to the display menu.

|                    |            |                        |
|--------------------|------------|------------------------|
| Settings interface | Set status | Optional configuration |
|--------------------|------------|------------------------|

|                                                                                    |  |                                                                                                           |
|------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------|
|                                                                                    |  | <b>Address setting</b><br>SDM120-MB Range:<br>001~250<br>SDM120-M Range:<br>001~247<br>Default: 001       |
|                                                                                    |  | <b>Baud rate setting</b><br>- SDM120-M<br>Option: 2.4k, 4.8k, 9.6k, 19.2k, 38.4kbps<br>Default: 9600bps   |
|                                                                                    |  | <b>Baud rate setting</b><br>- SDM120-MB<br>Option: 600, 1200, 2400, 4800, 9600bps<br>Default: 2400bps     |
|                                                                                    |  | <b>Parity bit setting</b><br>Option: EVEN, ODD, NONE<br>SDM120-MB default: EVEN<br>SDM120-M default: NONE |
|                                                                                    |  | <b>Stop bit setting</b><br>Option: 1, 2<br>Default: 1                                                     |
|                                                                                    |  | <b>*Secondary address High address setting</b><br>Range:<br>0000 to 9999                                  |
|                                                                                    |  | <b>*Secondary address Low address setting</b><br>Range:<br>0000 to 9999                                   |
| *The default setting of secondary address is same as the last 8 digits of meter SN |  |                                                                                                           |

## Chapter 4. Declaration of Conformity ( For MID meter only)

We, Zhejiang Eastron Electronic Co., Ltd. declares under our sole responsibility as the manufacturer that the three phase multi-function electrical energy meter SDM120-M(MB) 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/SGS0701.

Identification number of the Notified Body: 0598.

If you have any question, please feel free to contact our sales team.

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