

# SDM230-DI

*Smart Single Phase Energy Meter*



***USER MANUAL***  
***2025 V1.00***

# 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       |
|---------|----------|---------------|
| 1.00    | 2025-6-4 | Initial issue |

## 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

SDM230-DI 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, kVarh. Maximum demand current can be measured over preset periods of up to 60 minutes.

The meter is Max. 100A direct connected and do not need to connect with external current transformers(CT). An RS485 communication port is available on the meter for remote data transmission.

### 1.2 Product Characteristics

- Bi-directional measurement IMP & EXP
- RS485 Modbus RTU
- Multi-parameters measurement
- LCD with white backlit, adjustable backlit time

#### Measurements:

- Phase voltage: V
- Current: A
- Active power: W
- Reactive power: VAr
- Apparent power: VA
- 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\_imp (import reactive energy), Eq\_exp (export reactive energy), Eq\_total (total reactive energy)
- Maximum demand: MD

#### Setup:

- RS485 Modbus RTU
- Demand interval time
- Backlit time
- Clear Max. demand info & resettable energy & DI counts
- Password modification

## Chapter 2. Technical Parameters

### 2.1 Technical Parameters

|                                   |                              |
|-----------------------------------|------------------------------|
| Voltage AC (Un)                   | 230V AC                      |
| Voltage Range                     | 100 - 277V AC                |
| Current Input                     | 0.15-10(100)A                |
| Starting Current (Ist)            | 0.04A                        |
| Transition Current (Itr)          | 1A                           |
| 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 | ≤3VA                         |
| Display                           | LCD with white backlit       |
| Max. reading                      | 999999.9 kWh/kVArh           |

### 2.2 Mechanical Characteristics

|  |  |
|--|--|
| Net Weight                             | ≈166g                                  |
| IP Degree of Protection<br>(IEC 60529) | IP51 front display<br>IP20 whole meter |
| Dimensions (DxHxW)                     | 63*100*36mm                            |
| 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  | Resolution |
|-----------------|---|------------|
| Voltage         | ±0.5%   | 0.1V       |
| Current         | ±0.5%   | 0.001A     |
| Frequency       | ±0.2%   | 0.01Hz     |
| Power Factor    | ±0.01   | 0.001      |
| Active Power    | ±1%   | 0.001kW    |
| Reactive Power  | ±1%   | 0.001kVAr  |
| Apparent Power  | ±1%   | 0.001kVA   |
| Active Energy   | Class 1 or 0.5 IEC62053-21<br>Class B or C EN50470-3:2022 | 0.01kWh    |
| Reactive Energy | Class 2 IEC 62053-23                                      | 0.01kVArh  |

## 2.7 Digital input

SDM230-DI equips with two digital inputs.

| Contact type     | Dry Contact       |
|------------------|-------------------|
| Input resistance | 10k Ω             |
| Max.frequency    | 1kHz              |
| Response time    | 10ms              |
| Isolation        | 2.5KV ac for 1min |

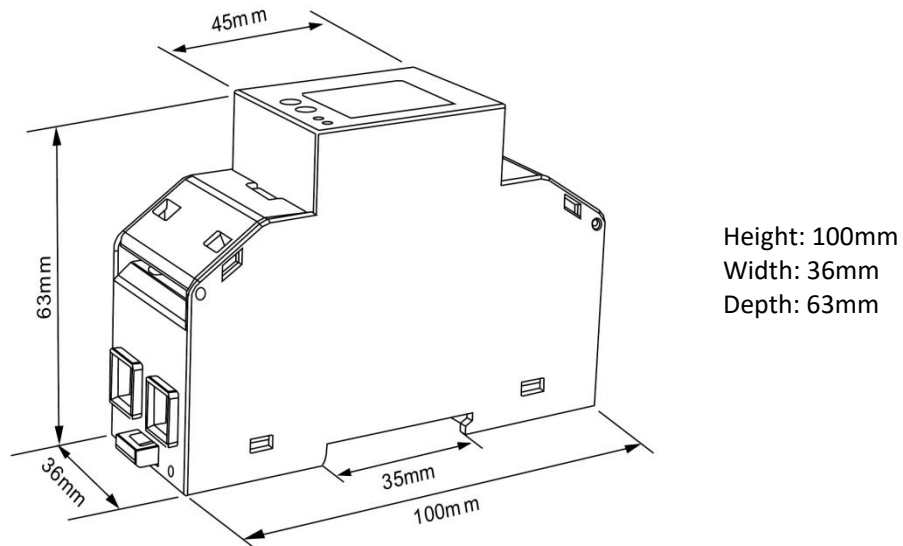
## 2.8 Outputs

### 2.8.1 RS485 Modbus RTU

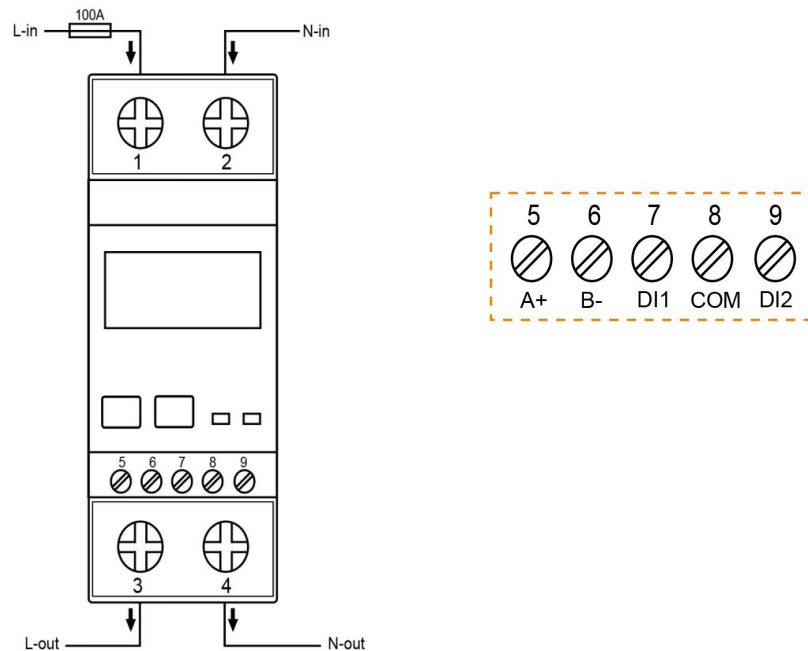
For Modbus RTU, the following RS485 communication parameters can be configured from the Set-up menu:

|                        |  |
|------------------------|--|
| Bus Type               | RS485  |
| Communication Protocol | Modbus RTU                                     |
| Baud Rate              | 2.4k/4.8k/9.6k(default)/19.2k/38.4k/115.2k 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  |

## 2.9 Dimensions



## 2.10 Wiring Diagram



## Wiring Guide

|                 |                        |                                     |
|-----------------|------------------------|-------------------------------------|
| Terminal<br>①~④ | Measurement Connection | Screw Connection                    |
|                 | Strip Length           | 17-18mm                             |
|                 | Screw                  | M7                                  |
|                 | Rigid/Supple           | 4-35mm <sup>2</sup> (11~2AWG)       |
|                 | Tightening Torque      | 3Nm                                 |
|                 | Model                  | PH3                                 |
| Terminal<br>⑤~⑨ | Measurement Connection | Screw Connection                    |
|                 | Strip Length           | 5-6mm                               |
|                 | Rigid/Supple           | 0.5-1.5mm <sup>2</sup> (22 ~ 14AWG) |
|                 | Tightening Torque      | 0.4Nm                               |
|                 | Model                  | PH0                                 |

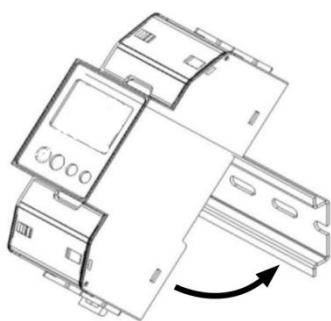
## Installation

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

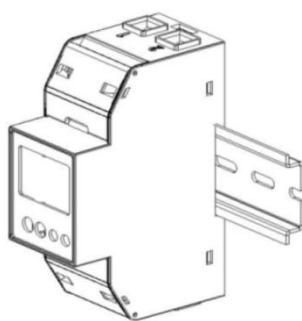
Step 2: Align Upper Slot with DIN Rail. Position the upper slot of the meter's DIN rail groove onto the DIN rail, ensuring full contact (see Figure 1).

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).

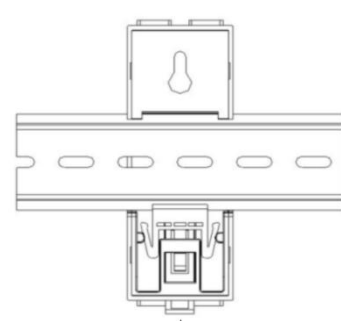
Step 4: Push up the back-end clip to lock the meter firmly onto the DIN rail (see Figure 3).



①







②





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.<br/>Note: the actual display might be different with the left on here.</p> |
|   | <p>The third screen show program number.<br/>Note: the actual display might be different with the left on here.</p>    |
|  | <p>The interface performs a self-test and indicates the result if the test passes.</p>                                 |

### 3.2 Button Functions

|   |   |
|---|---|
|  | <ul style="list-style-type: none"> <li>◆ In measurement mode:<br/>Short press: switch display screen<br/>Long press: cyclic redundancy check code</li> <li>◆ In setup mode:<br/>Short press: next page or increase value<br/>Long press: back to previous menu</li> </ul> |
|  | <ul style="list-style-type: none"> <li>◆ In measurement mode:<br/>Long press: enter setup mode</li> <li>◆ In setup mode:<br/>Short press: move the cursor<br/>Long press: confirm setting</li> </ul>  |

### 3.3 Measurements













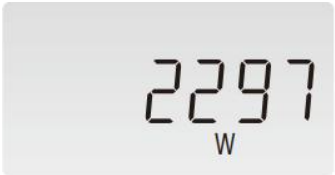



Each successive pressing of the button selects a new range:

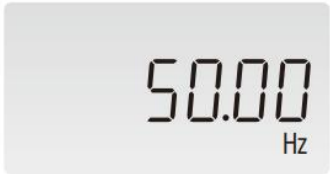


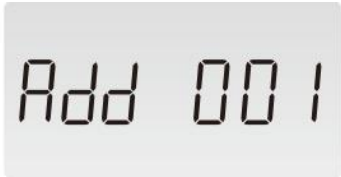

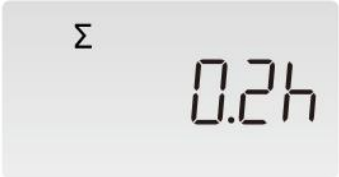
Can be viewed by pressing the button:

Total active energy in kWh → Imported active energy in kWh → Exported active energy in kWh → Resettable total active energy → Resettable imported active energy → Resettable exported active energy → Total reactive energy in kVARh → Imported reactive energy in kVARh → Exported reactive energy in kVARh → Resettable total reactive energy → Resettable imported reactive energy → Resettable exported reactive energy → Maximum total power demand → Phase to neutral voltage → Current → Instantaneous active power in W → Instantaneous reactive power in VAr → Instantaneous volt-amps in VA → Power factor → Frequency → DI1 counts → DI2 counts → Modbus address → Baud rate → Total running time

|  |                                   |
|--|-----------------------------------|
|  | Total active energy in kWh        |
|  | Imported active energy in kWh     |
|  | Exported active energy in kWh     |
|  | Resettable total active energy    |
|  | Resettable imported active energy |



|   |                                     |
|---|-------------------------------------|
|    | Resettable exported active energy   |
|    | Total reactive energy in kVArh      |
|    | Imported reactive energy in kVArh   |
|  | Exported reactive energy in kVArh   |
|  | Resettable total reactive energy    |
|  | Resettable imported reactive energy |
|  | Resettable exported reactive energy |

|   |                                     |
|---|-------------------------------------|
|    | Maximum total power demand          |
|    | Phase to neutral voltage            |
|    | Current                             |
|  | Instantaneous active power in W     |
|  | Instantaneous reactive power in VAr |
|  | Instantaneous volt-amps in VA       |
|  | Power factor                        |


|   |                    |
|---|--------------------|
|    | Frequency          |
|    | DI1 counts         |
|    | DI2 counts         |
|  | Modbus address     |
|  | Baud rate          |
|  | Total running time |







3.4 Auxiliary Mode



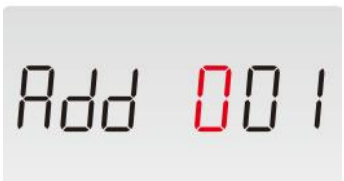
Each successive Long pressing of the  button enter the auxiliary mode:

|   |                |
|---|----------------|
|  | CRC-high bytes |
|  | CRC-low bytes  |

3.5 Setup Mode

The meter’s settable parameters are password protected. Each successive long pressing on the  button to enter setup mode. Some menu items, such as password, require a four-digit number entry while others, such as baud rate, require selection from a number of menu options.

- 1.Long press  button, after entering the password, long-press again to enter setup mode;
- 2.Short press  button, select the settings menu;
- 3.Long press  button to access the edit interface, short press  button to select the required settings, long-press  again to confirm the setting;
- 4.Long press  button to return to the higher menu level.

| Settings interface  | Set status   | Optional configuration  |
|---|--|---|
|  |  | <b>Password</b><br>Default: 1000                                |
|  |  | <b>Modbus Address setting</b><br>Range: 001~247<br>Default: 001 |

|  |  |   |
|--|--|---|
|  |  | <b>Baud rate setting</b><br>Option: 2.4k, 4.8k, 9.6k, 19.2k, 38.4k, 115.2k bps<br>Default: 9.6k bps |
|  |  | <b>Parity bit setting</b><br>Option: EVEN, ODD, NONE<br>Default: NONE                               |
|  |  | <b>Demand interval time setting</b><br>Option: OFF, 5, 10, 15, 30, 60min<br>Default: 60min          |
|  |  | <b>Auto-Cycle display time setting</b><br>Range: 00~30S<br>Default: 0S                              |
|  |  | <b>Backlit time setting</b><br>Option: OFF, 5, 10, 20, 30, 60min<br>Default: 60min                  |
|  |  | <b>CLR</b><br>Option:<br>Max. demand,<br>resettable energy,<br>DI counts<br>Default: Max. demand    |
|  |  | <b>Password setting</b><br>Range: 0000~9999<br>Default: 1000  |

|   |  |   |
|---|--|---|
|  |  | <b>DI filter time setting</b><br>Range: 000~255 mS<br>Default: 100 mS |
|---|--|---|

## 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 SDM230-DI 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 T 12800.

Identification number of the Notified Body: 0122.

## Chapter 5. Communication Protocol

### 5.1 Summary

Modbus RTU is a protocol based on serial communication, its frame structure is compact and efficient. A complete Modbus RTU frame includes the following parts:

| Field             | Length    | Explain  |
|-------------------|-----------|--|
| Device address    | One byte  | The address of the machine is 1 to 247, with 0 reserved for broadcast addresses.                                 |
| Function code (1) | One byte  | Indicates the type of operation requested by the master device (such as reading registers, writing coils, etc.). |
| Data fields       | Variable  | Contains specific data such as register addresses and register values that are requested or responded to.        |
| CRC check         | Two bytes | Used to verify the integrity of frames and ensure the reliability of data transmission.                          |

(1): Common function codes:

01: Read Coils

02: Read Discrete Inputs

03: Read the Holding register

04: Read the Input register

05: Write to Single Coil

16: Write to Multiple register

### 5.2 Modbus Frame Format

(1) Request frame

| First byte               |               |  |   | Last byte                       |                                  |                      |                       |
|--------------------------|---------------|--|---|---------------------------------|----------------------------------|----------------------|-----------------------|
| From the machine address | Function code | The starting address of the register (high byte) | The starting address of the register (lower byte) | Number of registers (high byte) | Number of registers (lower byte) | CRC check (low byte) | CRC check (high byte) |

The meaning of each byte is as follows:

1. Device address (byte 1): The host device specifies which slave device to communicate with through this

address.

2. Function code (byte 2): Defines the type of operation requested by the host device.
3. Register starting address (bytes 3 and 4): indicates the starting address of the register to be operated. Byte 3 is the high byte, and byte 4 is the low byte. For example, 00 01 indicates that the register address is 0x00 01 .
4. Register number (byte 5 and byte 6): indicates the number of registers to be read or written. Byte 5 is the high byte and byte 6 is the low byte. For example, 00 02 indicates that two registers are read.
5. CRC check (bytes 7 and 8): Used to verify the integrity of a frame. CRC check is based on all bytes in the frame (from the device address to the data field). Byte 7 is the low byte (the lowest valid bit), and byte 8 is the high byte (the highest valid bit).

#### (2)Normal response frame

| First byte                      |               |                 |                                 | Last byte                      |                                  |                                 |                      |                       |
|---------------------------------|---------------|-----------------|---------------------------------|--------------------------------|----------------------------------|---------------------------------|----------------------|-----------------------|
| From the machine device address | Function code | Number of bytes | First register data (high byte) | First register data (low byte) | Second register data (high byte) | Second register data (low byte) | CRC check (low byte) | CRC check (high byte) |

The meaning of each byte is as follows:

1. Device address (byte 1): Consistent with the device address in the request frame, indicating the slave device address of the response.
2. Function code (byte 2): Consistent with the function code in the request frame, indicating the operation type.
- 3, number of bytes (bytes 3): indicates the number of bytes returned by the data. For example, if two registers are read and each register is 2 bytes, then the number of bytes is 4.
4. Data Fields (Bytes 4 to 7): These contain the register data returned by the slave device. Floating-point numbers (Float) are split into two 16-bit registers (4 bytes), with each register occupying 2 bytes. Eastron uses big-endian (Big-Endian) format, where Register 1 represents the high 16 bits (Bytes 1 and 2), and Register 2 represents the low 16 bits (Bytes 3 and 4). For example: the return data is 12 34 56 78, where 12 34 indicates the value of the first register is 0x12 34 , and 56 78 indicates the value of the second register is 0x56 78 .
5. CRC check (bytes 8 and 9): Used to verify the integrity of the response frame. The CRC check is based on all bytes in the frame (from the device address to the data field).

#### (3)Abnormal response frame

| First byte                      |  |                | Last byte            |                       |
|---------------------------------|--|----------------|----------------------|-----------------------|
| From the machine device address | Abnormal function code (Feature code + 0x80) | Exception code | CRC check (low byte) | CRC check (high byte) |

The meaning of each byte is as follows:

1. Device address (byte 1): Confirm whether the slave device address is consistent with the request frame.
2. Abnormal function code (byte 2): Check whether the highest bit of the function code is 1. Abnormal function code = normal function code + 0x80.
3. Exception code (byte 3): Illegal request.
4. CRC check (bytes 4 and 5): Used to verify the integrity of the response frame. CRC check is based on all bytes in the frame (from the device address to the data field).

## 5.1 Input Register

| Function | Description |
|----------|-------------|
|----------|-------------|

|      |                     |
|------|---------------------|
| code |                     |
| 04   | Read Input Register |

| Address<br>(Register) | Input Register Parameter                 |                   |                |                    | ModBus address Hex |         |
|-----------------------|--|-------------------|----------------|--------------------|--------------------|---------|
|                       | Description                              | Length<br>(bytes) | Data<br>Format | Units              | Hi Byte            | Lo Byte |
| 30001                 | L1 line to neutral RMS volts             | 4                 | Float          | V                  | 00                 | 00      |
| 30007                 | L1 RMS current                           | 4                 | Float          | A                  | 00                 | 06      |
| 30013                 | L1 active power                          | 4                 | Float          | W                  | 00                 | 0C      |
| 30019                 | L1 apparent power                        | 4                 | Float          | VA                 | 00                 | 12      |
| 30025                 | L1 reactive power                        | 4                 | Float          | VA <sub>r</sub>    | 00                 | 18      |
| 30031                 | L1 power factor                          | 4                 | Float          | None               | 00                 | 1E      |
| 30037                 | L1 phase angle                           | 4                 | Float          | Degrees            | 00                 | 24      |
| 30071                 | Frequency                                | 4                 | Float          | Hz                 | 00                 | 46      |
| 30073                 | Import active energy                     | 4                 | Float          | kWh                | 00                 | 48      |
| 30075                 | Export active energy                     | 4                 | Float          | kWh                | 00                 | 4A      |
| 30077                 | Import reactive energy                   | 4                 | Float          | kVA <sub>r</sub> h | 00                 | 4C      |
| 30079                 | Export reactive energy                   | 4                 | Float          | kVA <sub>r</sub> h | 00                 | 4E      |
| 30081                 | Apparent energy                          | 4                 | Float          | kVAh               | 00                 | 50      |
| 30083                 | Ah                                       | 4                 | Float          | Ah                 | 00                 | 52      |
| 30085                 | Total active power demand                | 4                 | Float          | W                  | 00                 | 54      |
| 30087                 | Maximum total active power demand        | 4                 | Float          | W                  | 00                 | 56      |
| 30089                 | Import active power demand               | 4                 | Float          | W                  | 00                 | 58      |
| 30091                 | Import active power max. demand          | 4                 | Float          | W                  | 00                 | 5A      |
| 30093                 | Export active power demand               | 4                 | Float          | W                  | 00                 | 5C      |
| 30095                 | Export active power max. demand          | 4                 | Float          | W                  | 00                 | 5E      |
| 30259                 | L1 current demand                        | 4                 | Float          | A                  | 01                 | 02      |
| 30265                 | Maximum L1 current demand                | 4                 | Float          | A                  | 01                 | 08      |
| 30343                 | Total kWh                                | 4                 | Float          | kWh                | 01                 | 56      |
| 30345                 | Total kVA <sub>r</sub> h                 | 4                 | Float          | kVA <sub>r</sub> h | 01                 | 58      |
| 30385                 | Current resettable total active energy   | 4                 | Float          | kWh                | 01                 | 80      |
| 30387                 | Current resettable total reactive energy | 4                 | Float          | kVA <sub>r</sub> h | 01                 | 82      |
| 310001                | Total import active energy               | 8                 | Int64          | Wh                 | 27                 | 10      |
| 310005                | Total export active energy               | 8                 | Int64          | Wh                 | 27                 | 14      |
| 310009                | Total import reactive energy             | 8                 | Int64          | VA <sub>r</sub> h  | 27                 | 18      |
| 310013                | Total export reactive energy             | 8                 | Int64          | VA <sub>r</sub> h  | 27                 | 1C      |
| 310021                | Total active Energy                      | 8                 | Int64          | Wh                 | 27                 | 24      |

|        |                              |   |       |             |    |    |
|--------|------------------------------|---|-------|-------------|----|----|
| 310025 | Total reactive Energy        | 8 | Int64 | Varh        | 27 | 28 |
| 310251 | L1 line to neutral volts     | 4 | Int32 | 0.1V        | 28 | 0A |
| 310257 | L1 current                   | 4 | Int32 | 0.001A      | 28 | 10 |
| 310263 | L1 active power              | 4 | Int32 | 0.1W        | 28 | 16 |
| 310269 | L1 apparent power            | 4 | Int32 | 0.1VA       | 28 | 1C |
| 310275 | L1 reactive power            | 4 | Int32 | 0.1VAR      | 28 | 22 |
| 310281 | L1 power factor              | 4 | Int32 | 0.01        | 28 | 28 |
| 310287 | L1 phase angle               | 4 | Int32 | 0.01Degress | 28 | 2E |
| 310309 | Frequency of supply voltages | 4 | Int32 | 0.01Hz      | 28 | 44 |

**Notes:**

1. The power factor has its sign adjusted to indicate the direction of the current. Positive refers to forward current, negative refers to reverse current.
2. The power sum demand calculation is for import – export.
3. Total kWh / kVarh equals to Import + export.

**5.2 Holding Register**

| Function code | Description                      |
|---------------|----------------------------------|
| 10            | Write parameter holding register |
| 03            | Read parameter holding register  |

| Address Register | Parameter                                      | Modbus Protocol Start Address Hex |          | Valid range   | Mode<br>(ro: read only<br>wo: write only<br>r/w: read/write) |
|------------------|--|-----------------------------------|----------|---|--|
|                  |  | High Byte                         | Low Byte |   |  |
| 40003            | Demand Period                                  | 00                                | 02       | Demand Period time range: 0 to 60, 0 represents real-time update (demand updated every 1 second).<br>Default: 60min<br>Length : 4 bytes<br>Data Format : Float                                    | r/w  |
| 40015            | Key Parameter Programming Authorization (KPPA) | 00                                | 0E       | Read: to get the status of the KPPA<br>0 = not authorized<br>1 = authorized<br>Write the correct password to get KPPA, enable to program key parameters.<br>Length: 4 bytes<br>Data Format: Float | r/w  |
| 40019            | Parity Stop                                    | 00                                | 12       | Write the network port parity/stop bits for MODBUS Protocol, where:<br>0 = One stop bit and no parity<br>1 = One stop bit and even parity   | r/w  |

|       |                             |    |    |   |     |
|-------|-----------------------------|----|----|---|-----|
|       |                             |    |    | 2 = One stop bit and odd parity<br>3 = Two stop bits and no parity<br>Default: One stop bit and no parity<br>Length: 4 bytes<br>Data Format: Float                                |     |
| 40021 | Modbus Address              | 00 | 14 | Address: 1 to 247 for MODBUS Protocol<br>default : 1<br>Length : 4 bytes<br>Data Format : Float   | r/w |
| 40025 | Password                    | 00 | 18 | Set range 0000 ~ 9999<br>Default: 1000<br>Length: 4 bytes<br>Data Format: Float   | r/w |
| 40029 | Baud Rate                   | 00 | 1C | Settable value:<br>0 = 2.4k bps<br>1 = 4.8k bps<br>2 = 9.6k bps<br>3 = 19.2k bps<br>4 = 38.4k bps<br>6 = 115.2k bps<br>Default: 9.6k bps<br>Length: 4 bytes<br>Data Format: Float | r/w |
| 40059 | Automatic scrolling display | 00 | 3A | Set range 0~30, unit: second, Default0.<br>0 Stands for no scrolling display.<br>Length: 4 bytes<br>Data Format: Float  | r/w |
| 40061 | Backlight time              | 00 | 3C | Backlight time range: 0~121min<br>0 means always on, 121 means always off.<br>Default: 60 min<br>Length: 4 bytes<br>Data Format: Float  | r/w |
| 40769 | DI filter time              | 03 | 00 | DI filter time (0ms: 0~255) ,<br>Default 100ms<br>Length : 2 byte<br>Data Format : unsigned int16   | r/w |
| 40770 | DI-1 count                  | 03 | 01 | DI-1 count<br>Length : 4 byte<br>Data Format : unsigned int32<br>Write 0 to reset the count. No response if write other value.  | r/w |
| 40772 | DI-2 count                  | 03 | 03 | DI-2 count<br>Length : 4 byte<br>Data Format : unsigned int32<br>Write 0 to reset the count. No response if write other value   | r/w |

|        |                  |    |    |  |     |
|--------|------------------|----|----|--|-----|
| 461457 | Reset            | F0 | 10 | 00 00 = reset the Maximum demand<br>00 = kWh<br>00 06 = reset DI counts<br>Length : 2 bytes<br>Data Format: Hex                  | wo  |
| 463777 | Measurement mode | F9 | 20 | 00 01: total = import<br>00 02: total = import + export<br>00 03: total = import - export<br>Length: 2 bytes<br>Data Format: hex | r/w |
| 463793 | Running time     | F9 | 30 | Continuous working period--hour<br>Length: 4 bytes<br>Data Format: float   | r/w |
| 464513 | Serial Number    | FC | 00 | Serial number<br>Length : 4 bytes<br>Data Format : unsigned int32  | ro  |
| 464515 | Meter Code       | FC | 02 | Read meter code<br>Length : 2 bytes<br>Data Format : hex   | ro  |
| 464645 | Software version | FC | 84 | Software version XX.YY<br>XX = first byte<br>YY = second byte<br>Length : 2 bytes<br>Data Format : Hex                           | ro  |
| 464647 | Program Number   | FC | 86 | Read program number<br>Length : 2 bytes<br>Data Format : Hex   | ro  |

**Example:**

The host sends a request frame and reads the demand period(register: 40003):

| field                       | Value (hexadecimal) | explain   |
|-----------------------------|---------------------|---|
| Device address              | 0x01                | The address of the meter is 1                         |
| Function code               | 0x03                | Read the hold register                                |
| Start address high byte     | 0x00                | The high byte of the starting address of the register |
| Start address low byte      | 0x02                | The low byte of the starting address of the register  |
| Register count high byte    | 0x00                | Read the high byte of the register count              |
| Register count low byte     | 0x02                | Read the low byte of the register count               |
| The CRC check the low byte  | 0x65                | The CRC check the low byte                            |
| The CRC check the high byte | 0xCB                | The CRC check the high byte                           |

After receiving the request, the meter returns the data in the register. Suppose the demand period stored in the register is 60 minutes:

| field          | Value (hexadecimal) | explain                       |
|----------------|---------------------|-------------------------------|
| Device address | 0x01                | The address of the meter is 1 |
| Function code  | 0x03                | Read the hold register        |

|                             |      |  |
|-----------------------------|------|--|
| Number of bytes             | 0x04 | Number of bytes of data returned (2 registers x 2 bytes) |
| Data high byte 1            | 0x42 | The high byte of the first register                      |
| Data low byte 1             | 0x70 | The low byte of the first register                       |
| Data high byte 2            | 0x00 | The high byte of the second register                     |
| Data low byte 2             | 0x00 | The low byte of the second register                      |
| The CRC check the low byte  | 0xEF | The CRC check the low byte                               |
| The CRC check the high byte | 0x90 | The CRC check the high byte                              |

The host sends out a request frame and sets the demand period to 15 minutes (register: 40003):

| field                       | Value (hexadecimal) | explain   |
|-----------------------------|---------------------|---|
| Device address              | 0x01                | The address of the meter is 1                             |
| Function code               | 0x10                | Write to multiple registers                               |
| Start address high byte     | 0x00                | The high byte of the starting address of the register     |
| Start address low byte      | 0x02                | The low byte of the starting address of the register      |
| Register count high byte    | 0x00                | Write the high byte of the number of registers            |
| Register count low byte     | 0x02                | Write the low byte of the number of registers             |
| Number of bytes             | 0x04                | Number of bytes written into data (2 registers x 2 bytes) |
| Data high byte 1            | 0x41                | The high byte of the first register                       |
| Data low byte 1             | 0x70                | The low byte of the first register                        |
| Data high byte 2            | 0x00                | The high byte of the second register                      |
| Data low byte 2             | 0x00                | The low byte of the second register                       |
| The CRC check the low byte  | 0x67                | The CRC check the low byte                                |
| The CRC check the high byte | 0x91                | The CRC check the high byte                               |

After receiving the request, the machine sets the demand cycle to 15 minutes and returns a response frame:

| field                        | Value (hexadecimal) | explain   |
|------------------------------|---------------------|---|
| Device address               | 0x01                | The address of the machine is 1                       |
| Function code                | 0x10                | Write to multiple registers                           |
| Start address high byte      | 0x00                | The high byte of the starting address of the register |
| Low byte of starting address | 0x02                | The low byte of the starting address of the register  |
| Register count high byte     | 0x00                | Write the high byte of the number of registers        |
| Register count low byte      | 0x02                | Write the low byte of the number of registers         |
| The CRC check the low byte   | 0xE0                | The CRC check the low byte                            |
| The CRC check the high byte  | 0x08                | The CRC check the high byte                           |

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

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