

# SDM630 MCT V2 Series

Three Phase Multifunction Energy Meter



## DIN RAIL SMART METER FOR SINGLE AND THREE PHASE ELECTRICAL SYSTEMS

User Manual v5.0

### Safety Instruction

The Installation instructions do not include a complete list of all safety measures necessary for operating the device. Special operating conditions may require additional measures. The installation instructions contain notes that must be observed for your personal safety to prevent property damage. Safety instructions in this document are highlighted with a warning triangle and are presented as follows depending on the level of risk.

The general warning symbol calls attention to possible risks of injury. Observe all the instructions listed under the symbol to prevent injuries or even death.

This additional symbol indicates any electrical danger that can result in serious injuries or death.

### Attention

Warns of an imminently dangerous situation that can result in property damage or environmental damage in the event of noncompliance.

## 1. Introduction

This document provides operating, maintenance and installation instructions. This unit measures and displays the characteristics of single phase two wire(1p2w), three phase three wire(3p3w) and three phase four wire(3p4w) networks. The measuring parameters include voltage(V), frequency(Hz), current(A), power(kW/kVA / kVA), import, export and total Energy(kWh/kVAh). The unit can also measure Maximum demand of current and power. This is measured over preset periods of up to 60 minutes.

This unit is a 1A or 5A current transformer operated and can be configured to work with a wide range of CTs. Built-in pulse and Modbus or M-Bus outputs. Configuration is password protected.

This unit can be powered by a separate auxiliary (AC or DC) supply. Alternatively it can be powered from the monitored supply by linking the voltage reference and neutral reference to terminals 5 and 6 (Please refer to wiring diagram).

### 1.1 Unit Characteristics

This series includes 4 models:

SDM630MCT V2	SDM630MCT-Mbus V2	SDM630MCT-2T V2	SDM630MCT-2T-Mbus
Multi-parameter measurement	Multi-parameter measurement	Multi-parameter measurement	Multi-parameter measurement
Single Tariff	Single Tariff	2 Tariffs (dual source)	2 Tariffs (dual source)
RS485 Modbus	M-Bus EN13757-3	RS485 Modbus	M-Bus EN13757-3

### 1.2 RS485 Modbus RTU / M-Bus

SDM630MCT V2 and SDM630MCT-2T V2 have a RS485 port with RTU protocol. SDM630MCT-Mbus V2 and SDM630MCT-2T-Mbus have a M-Bus port complying with EN13757-3. Refers to section 4.2.

### 1.3 Current Transformer Primary Current

SDM630MCT V2 Series is CT operated. you will need to set the correct CT rate. Refers to section 4.3

### 1.4 Pulse Output

Two pulse outputs that pulse measured active and reactive energy. The Pulse 2 constant for active energy is fixed at 3200imp/kWh. The pulse output 1 is configurable. Refers to section 4.5

## 2. Start Up Screens

	The first screen lights up all display segments and can be used as a display check.
	Software version information (This information is for reference only, in kind prevail.)
	The interface performs a self-test and indicates the result if the test passes.

\*After a short delay, the screen will display active energy measurements.

## 3. Measurements

The buttons operate as follows:

	Selects the Voltage and Current display screens. In Set-up Mode, this is the "Left" or "Back" button.
	Select the Frequency and Power factor display screens. In Set-up Mode, this is the "Up" button.
	Select the Power display screens. In Set-up Mode, this is the "Down" button.

Select the Energy display screens. In Set-up mode, this is the "Enter" or "Right" button.

### 3.1 Voltage and Current

Each successive press of the button selects a new parameter:

	Phase to neutral voltages.
	Current on each phase.
	Neutral Current
	Phase to neutral voltage THD%.
	Current THD% for each phase.

### 3.2 Frequency and Power Factor and Demand

Each successive press of the button selects a new range:

	Frequency and Power Factor (total).
	Power Factor of each phase.
	Maximum Current Demand.
	Maximum Power Demand.

### 3.3 Power

Each successive press of the button selects a new range:

	Instantaneous Active Power in kW.
	Instantaneous Reactive Power in kVA.
	Total kW, kVA, kVA.

### 3.4 Energy Measurements

Each successive press of the button selects a new range:

	Total Active Energy in kWh.
	Total Reactive Energy in kVAh.
	Import Active Energy in kWh. *Not shown on SDM630MCT-2T
	Export Active Energy in kWh. *Not shown on SDM630MCT-2T

	Import Reactive Energy in kVAh. *Not shown on SDM630MCT-2T
	Export Reactive Energy in kVAh. *Not shown on SDM630MCT-2T
	T1 Active Energy in kWh *For SDM630MCT-2T and SDM630MCT-2T-Mbus only
	T2 Active Energy in kWh *For SDM630MCT-2T and SDM630MCT-2T-Mbus only
	T1 Reactive Energy in kVAh *For SDM630MCT-2T and SDM630MCT-2T-Mbus only
	T2 Reactive Energy in kVAh *For SDM630MCT-2T and SDM630MCT-2T-Mbus only

## 4. Set Up

To enter set-up mode, press the button for 3 seconds until the password screen appears.

	Setting up is password-protected. The user should enter the correct password (default '1000') before processing.
	If an incorrect password is entered, the display will show: PASS Err

To exit setting-up mode, press repeatedly until the measurement screen is restored.

### 4.1 Set-up Entry Methods

Some menu items, such as password and CT, require a four-digit number entry while others, such as supply system, require selection from a number of menu options.

#### 4.1.1 Menu Option Selection

- Use the and buttons to scroll through the different options of the set up menu.
- Press to confirm your selection
- If an item flashes, then it can be adjusted by the and buttons.
- Having selected an option from the current layer, press to confirm your selection.
- Having completed a parameter setting, press to return to a higher menu level. You will be able to use the and buttons for further menu selection.
- On completion of all setting-up, press repeatedly until the measurement screen is restored.

#### 4.1.2 Number Entry Procedure

When setting up the unit, some screens require the entering of a number. In particular, on entry to the setting up section, a password must be entered. Digits are set individually, from left to right. The procedure is as follows:

- The current digit to be set flashes and is set using the and buttons.
- Press to confirm each digit setting.
- After setting the last digit, press to exit the number setting routine.

## 4.2 Communication

### 4.2.1 RS485/Mbus Primary Address

	From the set-up menu, use  and  buttons to select the address ID.
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(The range is from 001 to 247 for Modbus and 001 to 250 for Mbus)

	Press  button to enter the selection routine. The current setting will flash
--	--

	Use  and  buttons to choose Modbus or Mbus primary address
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Procedure, press button to confirm the setting and press button to return the main set-up menu.

### 4.2.2 Mbus Secondary Address

	Secondary address: 00 00 00 01 to 99 99 99 99 From the set-up menu, use  and  buttons to find the setting page.
	Press  to enter the selection routine. The current setting will flash.
	Use  and  buttons to set the secondary address

Press to confirm the setting and press to return to the main set up menu.

### 4.2.3 Baud Rate

Baud rate range for Modbus RTU: 2.4k, 4.8k, 9.6k, 19.2k, 38.4k. For Mbus: 0.3k, 0.6k, 2.4k, 4.8k, 9.6k.

	From the set-up menu, use  and  buttons to select the baud rate option.
	Press  to enter the selection routine. The current setting will flash.
	Use  and  buttons to choose baud rate 2.4k, 4.8k, 9.6k, 19.2k, 38.4k

Press to confirm the setting and press to return to the main set-up menu.

### 4.2.4 Parity

	From the set-up menu, use  and  buttons to select the parity option.
	Press  to enter the selection routine. The current setting will flash.
	Use  and  buttons to choose parity (EVEN/ODD/NONE(default)).

Press to confirm the setting and press to return to the main set-up menu.

### 4.2.5 Stop Bits

	From the set-up menu, use  and  buttons to select the stop bit option.
	Press  to enter the selection routine. The current setting will flash.
	Use  and  buttons to choose stop bit (2 or 1) Note: Default is 1, and only when the parity is NONE that the stop bit can be changed to 2.

Press to confirm the setting and press to return to the main set-up menu.

### 4.3 CT

The CT option sets the secondary current (CT2 1A or 5A) of the current transformer (CT) that wires to the meter.

	From the set-up menu, use  and  buttons to select the CT option.
	Secondary CT setting Press  to enter the CT Secondary current selection routine: 5A/1A

**CT RATE**  
0001

Set CT rate value  
Press **E** to enter the CT rate setting screen. The range is from 0001 to 2000.

For example, if using a 100/5A current transformer you will enter 0020, as you need to divide the primary by the secondary to get the ratio (CT rate).

\* Please note for the MID approved version device, you will only have one opportunity to set the CT rate.

#### 4.4 PT

The PT option sets the secondary voltage (PT2 100 to 500V) of the voltage transformer (PT) that may be connected to the meter.

**SEL**  
**PT2**  
400

Use **M** and **P** buttons to select will PT option. The screen will show the voltage PT secondary voltage value. The default value is 400V.

**SEL**  
**PT2**  
400

Secondary PT setting  
Press **E** to enter the PT secondary voltage selection routine. The range is from 100 to 500V.

**PT**  
**RATE**  
0001

Set PT rate value  
Press **E** to enter the PT rate screen. The range is from 0001 to 2000.

For example, if set the rate to 100, it means the primary voltage equals secondary voltage x100.

#### 4.5 Pulse Output

The option allows you to configure the pulse output 1. The output can be set to provide a pulse for a defined amount of energy active or reactive. Use this section to set up the pulse output—Units: kWh, kVAh

**SEL** kWh  
**PLY**

From the set-up menu, use **M** and **P** buttons to select the Pulse output option.

**SEL** kWh  
**PLY**

Press **E** to enter the selection routine. The unit symbol will flash.

**SEL** kVAh  
**PLY**

Use **M** and **P** buttons to choose kWh or kVAh.

Press **E** to confirm the setting and press **W/T** to return to the main set up menu.

#### 4.5.1 Pulse Rate

Use this to set the energy represented by each pulse. Rate can be set to 1 pulse per 0.01/0.1/1/10/100/1000kWh/kVAh.

**SEL**  
**RATE**  
10

(It shows 1 impulse = 10kWh/kVAh)

**SEL**  
**RATE**  
10

From the set-up menu, use **M** and **P** buttons to select the pulse rate option.

**SEL**  
**RATE**  
10

Press **E** to enter the selection routine. The current setting will flash. 0.01/0.1/1/10/100/1000kWh/kVAh per pulse.

Use **M** and **P** buttons to choose pulse rate.

Press **E** to confirm the setting and press **W/T** to return to the main set up menu.

#### 4.5.2 Pulse Duration

The energy monitored can be active or reactive and the pulse width can be set as 200, 100 or 60ms.

**SEL**  
**PULS**  
200

(It shows pulse width of 200ms)

**SEL**  
**PULS**  
200

From the set-up menu, use **M** and **P** buttons to select the pulse width option.

**SEL**  
**PULS**  
200

Press **E** to enter the selection routine. The current setting will flash.

Use **M** and **P** buttons to choose pulse width.

Press **E** to confirm the setting and press **W/T** to return to the main set-up menu.

#### 4.6 DIT Demand Integration Time

This sets the period in minutes over which the current and power readings are integrated for maximum demand measurement. The options are: 0, 5, 8, 10, 15, 20, 30, 60 minutes.

**SEL**  
**DIT**  
10

From the set-up menu, use **M** and **P** buttons to select the DIT option. The screen will show the currently selected integration time.

**SEL**  
**DIT**  
10

Press **E** to enter the selection routine. The current time interval will flash.

Use **M** and **P** buttons to choose the selection.

Press **E** to confirm the setting and press **W/T** to return to the main set-up menu.

#### 4.7 Backlit Set-up

The meter provides a function to set the backlit lasting time( 0/5/10/30/60/120 minutes).

Option 0 means the backlit always on here.

**SEL**  
**LP**  
60

Default:60  
If it is set as 5, the backlit will be off in 5minutes.

**SEL**  
**LP**  
60

Use **M** and **P** buttons to choose the time

Press **E** to confirm the setting and press **W/T** to return to the main set-up menu.

#### 4.8 Supply System

The unit has a default setting of 3Phase 4wire (3P4). Use this section to set the type of electrical system.

**SEL**  
**3P3**

From the set-up menu, use **M** and **P** buttons to select the system option. The screen will show the currently selected system type.

**SEL**  
**3P3**

Press **E** to enter the selection routine. The current selection will flash.

**SEL**  
**1P2**

Use **M** and **P** buttons to select the required system option: 1P2(W), 3P3(W), 3P4(W).

Press **E** to confirm the selection.

Press **W/T** to exit the system selection routine and return to the menu.

#### 4.9 CLR

The meter provides a function to reset the maximum demand value of current and power.

**CLR**

From the set-up menu, use **M** and **P** buttons to select the reset option.

**MD**  
**CLR**

Press **E** to enter the selection routine. The "MD" will flash.

Press **E** to confirm the reset and press **W/T** to return to the main set-up menu.

#### 4.10 Change Password

**SEL**  
**PASS**  
1000

Use the **M** and **P** buttons to choose the change password option.

**SEL**  
**PASS**  
1000

Press the **E** to enter the change password routine. The new password screen will appear with the first digit flashing.

**SEL**  
**PASS**  
1000

Use **M** and **P** to set the first digit and press **E** to confirm your selection. The next digit will flash.

**SEL**  
**PASS**  
1100

Repeat the procedure for the remaining three digits.

**SEL**  
**PASS**  
1100

After setting the last digit, Press **E** to confirm the selection.

Press **W/T** to exit the number setting routine and return to the Set-up menu.

#### 4.11 CT Reversal

If the CT connections are incorrectly wired, they can be reversed through the set-up menu:

**SEL**  
**545**  
**Cont**

Use the **M** and **P** buttons to select the menu option. Hold the **E** button to view the sub-menu.

**SEL**  
**1A**  
**Frd**

This screen will display, you can change Forward to Reverse on each individual CT connection.

**SEL**  
**1A**  
**rEU**

Hold the **E** button to confirm your adjustment. You can then move on to IB or IC using the **M** and **P** buttons.

Hold the **W/T** button for 3 seconds to exit the set up menu.

### 5. Specifications

#### 5.1 Measured Parameters

The unit can monitor and display the following parameters of a single phase two wire(1p2w), three phase three wire(3p3w) or three phase four wire(3p4w) system.

##### 5.1.1 Voltage and Current

- Phase to neutral voltages 100 to 276V a.c. (not for 3p3w supplies).
- Voltages between phases 173 to 480V a.c. (3p supplies only).
- Percentage total voltage harmonic distortion (THD%) for each phase to N (not for 3p3w supplies).
- Percentage voltage THD% between phases (three phase supplies only).
- Current THD% for each phase

##### 5.1.2 Power Factor and Frequency and Max. Demand

- Frequency in Hz
- Power factor
- Instantaneous power:
- Power 0 to 3600 MW
- Reactive power 0 to 3600 MVAR
- Volt-amps 0 to 3600 MVA
- Maximum demanded power since last reset
- Maximum neutral current demand, since the last reset (for three phase supplies only)

##### 5.1.3 Energy Measurements

- Import/Export active energy 0 to 9999999.9 kWh
- Import/Export reactive energy 0 to 9999999.9 kVAh
- Total active energy 0 to 9999999.9 kWh
- Total reactive energy 0 to 9999999.9 kVAh

#### 5.2 Measured Inputs

Voltage inputs through 4-way fixed connector with 2.5mm<sup>2</sup> stranded wire capacity. single phase two wire(1p2w), three phase three wire(3p3w) or three phase four wire(3p4w) unbalanced. Line frequency measured from L1 voltage or L3 voltage.

Three current inputs (six physical terminals) with 2.5mm<sup>2</sup> stranded wire capacity for connection of external CTs. Nominal rated input current 5A or 1A a.c. RMS.

Voltage AC (Un) 3x230(400)V  
Base Current (Ib) 5A  
Min. Current (Imin) 0.05A

#### 5.3 Accuracy

- Voltage 0.5% of range maximum
- Current 0.5% of nominal
- Frequency 0.2% of mid-frequency
- Power factor 1% of unity (0.01)
- Active power (W) ±1% of range maximum
- Reactive power (VAR) ±1% of range maximum
- Apparent power (VA) ±1% of range maximum
- Active energy (Wh) Class 1 IEC 62053-21 Class 2 IEC 62053-23
- Reactive energy (VAh)
- Total harmonic distortion 1% up to 31st harmonic
- Response time to step input 1s, typical, to >99% of final reading, at 50 Hz.

#### 5.4 Auxiliary Supply

Two-way fixed connector with 2.5mm<sup>2</sup> stranded wire capacity. 85 to 275V a.c. 50/60Hz ±10% or 120V to 380V d.c. ±20%. Consumption < 10W.

#### 5.5 Interfaces for External Monitoring

Three interfaces are provided:

- RS485/Mbus communication channel that can be programmed via protocol remotely.
- Pulse output(Pulse 1) indicating real-time measured energy (configurable)
- Pulse output(Pulse 2) 3200imp/kWh (non-configurable)

#### 5.6 Reference Conditions of Influence Quantities

Influence Quantities are variables that affect measurement errors to a minor degree. Accuracy is verified under nominal value (within the specified tolerance) of these conditions.

- Ambient temperature 23°C ±2°C
- Input frequency 50 or 60Hz ±2%
- Input waveform Sinusoidal (distortion factor < 0.005)
- Auxiliary supply voltage Nominal ±1%
- Auxiliary supply frequency Nominal ±1%
- Auxiliary supply waveform (if AC) Sinusoidal (distortion factor < 0.05)
- Magnetic field of external origin Terrestrial flux

#### 5.7 Environment

- Operating temperature -25°C to +55°C\*
- Storage temperature -40°C to +70°C\*
- Relative humidity 0 to 95%, non-condensing
- Altitude Up to 2000m
- Warm-up time 5s
- Vibration 10Hz to 50Hz, IEC 60068-2-6, 2g
- Shock 30g in 3 planes

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

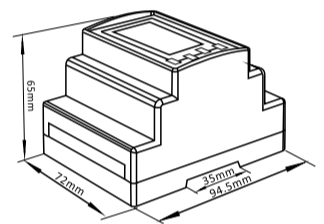
#### 5.8 Mechanics

- DIN rail dimensions 72 x 94.5 mm (WxH) per DIN 43880
- Mounting DIN rail 35mm
- Ingress protection IP51 (indoor)
- Material Self-extinguishing UL94 V-0

#### 5.9 Declaration of Conformity(for the MID approved version meter only)

We Zhejiang Eastron Electronic Co.,Ltd. Declare under our sole responsibility as the manufacturer that the poly phase multifunction electrical energy meter "SDM630MCT V2 Serie" correspond to the production model described in the EU -type examination certificate and to the requirements of the Directive 2014/32/EU EU type examination certificate number 0120/SGS0142. Identification number of the NB0598.

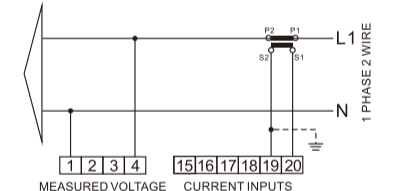
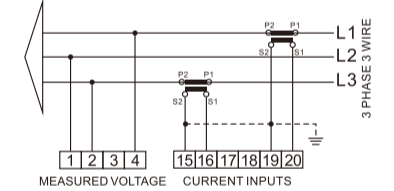
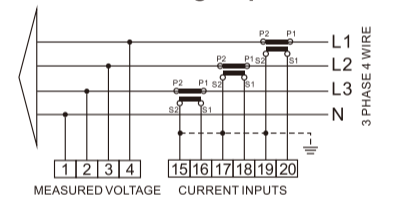
### 6. Dimensions



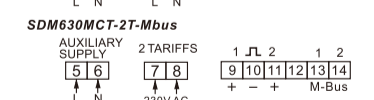
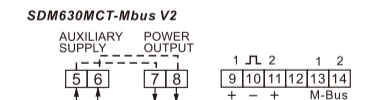
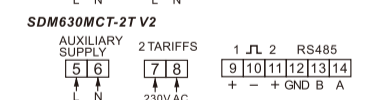
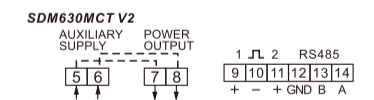
### 7. Wiring diagram

The wiring diagram of SDM630MCT V2 series has little difference from different models. please make sure the wiring is correct before turning on power of the meter.

#### Current and Voltage Inputs



#### Definitions of Other Terminals



Terminals Capacity	RS485 / Pulse / 2T	0.5-2.5mm <sup>2</sup>
	Load	
Screw Torque	RS485 / Pulse / 2T	0.2Nm
	Load	

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