

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

User Manual v5.0

#### Safety Instruction



#### 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/kVAr),import, export and total Energy(kWh/kVArh).The unit can also measures 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

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 RS485port with RTU protocol. SDM630MCT-Mbus V2 and SDM630MCT-2T-Mbus has a M-Busport 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

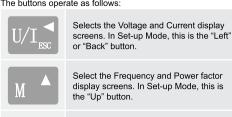
## 2.Start Up Screens

z.otart op ocreens	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	The first screen lights up all display segments and can be used as a display check.
5 o F Ł 1 l 0 l.03	Software version information (This information is for reference only, in kind pervall.)
105t EESt PRSS	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



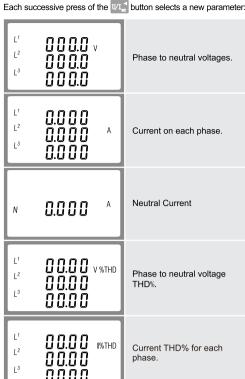
Select the Power display screens. In Setup Mode, this is the "Down" button.



# 3.1 Voltage and Current

Select the Energy display screens. In Set-

up mode, this is the "Enter" or "Right"



#### 3.2 Frequency and Power Factor and Demand

Each successive press of the A button selects a new range

≥ 00.00 Hz 0.999 pf	Frequency and Power Factor (total).
L' 0.999 L <sup>2</sup> 0.999 L <sup>3</sup> 0.999 PF	Power Factor of each phase.
L¹ 0.000 A L³ 0.000	Maximum Current Demand.
0.000 kW S	Maximum Power Demand.

### 3.3 Power

Each successive press of the P button selects a new range:

L¹ 0.000 kW 0.000 C kW 0.000 C kW 0.000 C	Instantaneous Active Power in kW.
L1	Instantaneous Reactive Power in kVAr.
L1 0.000 L2 0.000 L3 0.000 kVA	Instantaneous Volt-Amps in KVA.
0.000 kW ≥ 0.000 kVAr 0.000 kVA	Total kW, kVAr, kVA.

### 3.4 Energy Measurements

Each successive press of the E 🕹 button selects a new range:

0000 <sup>kWh</sup> ≥ 03 l.Y	Total Active Energy in kWh.
0000 ≥0000 kVArh	Total Reactive Energy in kVArh.
0000 kWh 0.3 14	Import Active Energy in kWh. *Not shown on SDM630MCT-2T
0 0 0 0 kWh	Export Active Energy in kWh. *Not shown on

\*Not shown on SDM630MCT-2T

OOOO kVArh	Import Reactive Energy in kVArh. *Not shown on SDM630MCT-2T
0000 0000 kvarh	Export Reactive Energy in kVArh. *Not shown on SDM630MCT-2T
T 1run KWh 0000 000.1	T1 Active Energy in kWh *For SDM630MCT-2T and SDM630MCT-2T-Mbus only
T 2 KWh 0000 0000	T2 Active Energy in kWh *For SDM630MCT-2T and SDM630MCT-2T-Mbus only
T 1run 0000 kvarh 000.2	T1 Reactive Energy in kVArh *For SDM630MCT-2T and SDM630MCT-2T-Mbus only
T 2 0000 kvarh 0000	T2 Reactive Energy in kVArh *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

P855 0000	Setting up is password- protected. The user should enter the correct password (default '1000') before processing.
PRSS	If an incorrect password is entered, the display will show:
Err	PASS Err

To exit setting-up mode, press U/1 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

- 1. Use the VI and P buttons to scroll through the different options of the set up menu.
- 2. Press E 🕹 to confirm your selection
- 3. If an item flashes, then it can be adjusted by the M and P buttons.
- 4. Having selected an option from the current layer, press  $_{\rm E}$   $\stackrel{>}{\sim}$ to confirm your selection.
- 5. Having completed a parameter setting, press UI to return to a higher menu level. You will be able to use the  $\[ \]_{\text{\'{I}}}$ and  $\begin{subarray}{c} \end{subarray}$  buttons for further menu selection.
- 6. On completion of all setting-up, press WI 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:

- 1. The current digit to be set flashes and is set using the M and  $\mathbb{P}^{\mathsf{T}}$  buttons.
- 2. Press E to confirm each digit setting.
- 3. After setting the last digit, press  $[\text{V/I}_{\text{ac}}]$  to exit the number setting routine

### 4.2 Communication

### 4.2.1 RS485/Mbus Primary Address



(The range is from 001 to 247 for Modbus and 001 to 250 for Mbus)

5 E Ł R d d r 0 0 1	From the set-up menu,
5E Ł 8ddr 10 I	Press E button to enter the selection routine. The current setting will flash



Use M A and P V buttons to choose Modbus or Mbus primary address

Procedure, press E 🕹 button to confirm the setting and press U/I button to return the main set-up menu.

#### 4.2.2 Mbus Secondary Address

4.E.E Misus occomulary Address		
9999 - 14-	Secondary address: 00 00 00 00 10 to 99 99 99 99 From the set-up menu, use X A and P D buttons to find the setting page.	
9999 - 14-	Press E  to enter the selection routine. The current setting will flash.	
- 1d - 1193 8 17 1	Use u A and P buttons to set the secondary address	
Press R to confirm the setting and press V/L to return to		

#### 4.2.3 Baud Rate

the main set up menu.

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.

8.6 × 8.8 × 9.6 ×	From the set-up menu, use v ^ and p v buttons to select the baud rate option.
5 E Ł 5 E Ł 9.6 *	Press E to enter the selection routine. The current setting will flash.
28.4 ×	Use u ^ and p V buttons to choose baud rate 2.4k, 4.8k, 9.6k, 19.2k, 38.4k
D	11/17 ◀

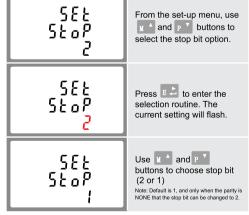
Press E to confirm the setting and press VI to return to the main set-up menu

### 4.2.4 Parity

5E Ł P R r I E u E N	From the set-up menu, use $\underline{\mathfrak{u}} \ ^{\wedge}$ and $\underline{\mathfrak{p}} \ ^{\vee}$ buttons to select the parity option.
SEŁ PRc! Eu <mark>EN</mark>	Press b to enter the selection routine. The current setting will flash.
SEŁ PR-I NONE	Use MA and PA buttons to choose parity (EVEN/ODD/NONE(default)).

Press E - to confirm the setting and press U/I to return to

### 4.2.5 Stop Bits



Press E to confirm the setting and press VI 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

25 5 25 7 26 7	From the set-up menu, use M ^ and P * buttons to select the CT option.
[ F \	Secondary CT setting  Press E to enter the  CT Secondary current selection routine:5A/1A



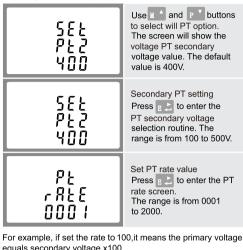
Set CT rate value Press E L to enter the CT rate setting screen. The range is from 0001 to 2000.

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/PT rate.

#### 4.4 PT

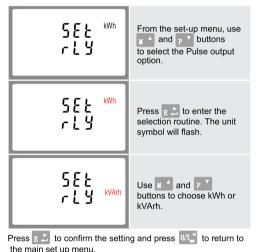
The PT option sets the secondary voltage (PT2 100 to 500V) of the voltage transformer (PT) that may be connected to the meter.



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, kVArh

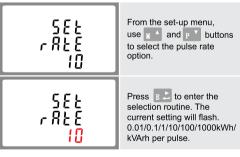


### 4.5.1 Pulse Rate

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/kVArh.



(It shows 1 impulse = 10kWh/kVArh)

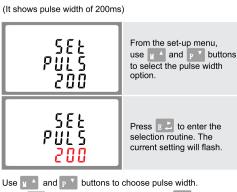


Use M A and P buttons to choose pulse rate. Press E L to confirm the setting and press V/I to return to the main set up menu.

### 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.

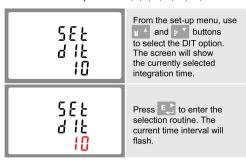




Use M A and P buttons to choose pulse width. Press E to confirm the setting and press U/I to return to the main set-up menu.

#### 4.6 DIT Demand Integration Time

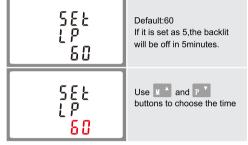
This sets the period in minutes over which the current and power readings are integrated for maximum demand measurement. The options are: 0, 5, 8, 10, 15, 20, 30, 60 minutes



Use M A and P buttons to choose the selection. Press E to confirm the setting and press VI to return to the main set-up menu.

#### 4.7 Backlit Set-up

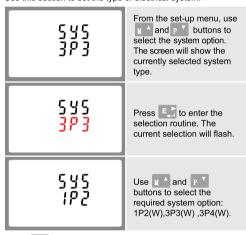
The meter provides a function to set the backlit lasting time (0/5/10/30/60/120 minutes). Option 0 means the backlit always on here.



Press E 🕹 to confirm the setting and press 🕪 🚅 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.

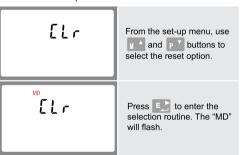


Press Li to confirm the selection.

Press VI to exit the system selection routine and return to

### 4.9 CLR

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



Press to confirm the reset and press vi\_i to return to the main set-up menu.

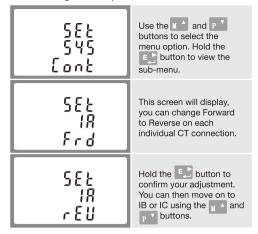
# 4.10 Change Password

4.10 Onange i assword			
5E Ł PRSS 1000	Use the x A and P T to choose the change password option.		
5E Ł PRSS 1000	Press the p to enter the change password routine. The new password screen will appear with the first digit flashing.		
5 E Ł P R S S 1000	Use M A and P Y to set the first digit and press E to confirm your selection. The next digit will flash.		
5E Ł PRSS 1 100	Repeat the procedure for the remaining three digits.		
SE	After setting the last digit, Press to confirm the selection.		

Press Wind 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:



Hold the  $\mathbb{U}_{\infty}$  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
- · 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 kVArh 0 to 9999999.9 kWh Total active energy Total reactive energy 0 to 9999999.9 kVArh

### 5.2 Measured Inputs

Voltage inputs through 4-way fixed connector with 2.5mm² 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

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 (lb) Min. Current (Imin) 0.05A

### 5.3 Accuracy

0.5% of range maximum Voltage 0.5% of nominal Current 0.2% of mid-frequency 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 (VArh) 1% up to 31st harmonic Total harmonic distortion 1s, typical, to >99% of · Response time to step input 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
- Pulse output(Pulse 1) indicating real-time measured energy
- 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.

23°C ±2°C · Ambient temperature • 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

-25°C to +55°C\* · Operating temperature Storage temperature -40°C to +70°C\*

 Relative humidity 0 to 95%, non-condensing Altitude Up to 2000m

 Warm-up time 10Hz to 50Hz, IEC Vibration

context of typical daily and seasonal variation.

60068-2-6, 2g 30g in 3 planes Shock \*Maximum operating and storage temperatures are in the

#### 5.8 Mechanics

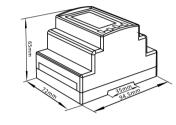
 DIN rail dimensions 72 x 94.5 mm (WxH) per DIN 43880 DIN rail 35mm Mounting · Ingress protection IP51 (indoor) Material Self-extinguishing UL94 V-0

#### 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 multifuntion electrical energy meter "SDM630MCT V2 Serise" 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

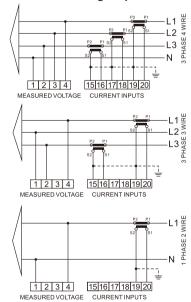
### 6.Dimensions



# 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**

	RS485 / Pulse / 2T	0.5~2.5mm²
Terminals Capacity	Load	0.5~2.5111111
Screw Torque	RS485 / Pulse / 2T	0.2Nm
Screw forque	Load	0.211111

Zhejiang Eastron Electronic Co., Ltd. No.1369, Chengnan Rd. Jiaxing, Zhejiang, China Tel:86 573 83698881/83698882 Email:sales@eastrongroup.com





