

SDM630 100A Series

Three Phase Multifunction Din Rail Energy Meter

Eastron

VCXPOWER

User Manual V2.0



1. Introduction

This document provides operating, maintenance and installation instructions. These units measure and displaythe characteristics of single phase two wires(1P2W), three phase three wires(3P3W) and three phase four wires(3P4W) networks. The measuring parameters include voltage (V), frequency (Hz), current (A), power (kW/kVA/kVAh), import, export and total energy (kWh/ kVAh). The units can also measure maximum current demand and power demand, this is measured over preset periods of up to 60 minutes.

These units are Max.100A direct connected and do not need to connect with external current transformers(CT). The unit is built-in with pulse,RS485/Mbus outputs. Configuration is password protected.

1.1 Unit Characteristics

The SDM630 100A series meters have 6 models: SDM630-P, SDM630-MT, SDM630-MB, SDM630-M, SDM630-2T, SDM630-MB-2T.

Model	Measurement	Communication	Tariff
SDM630-P	kWh/kVAh, kW/kVA, kVA, P, F, PF, dmd, V, A, THD, etc.	NO	Single Tariff
SDM630-M	kWh/kVAh, kW/kVA, kVA, P, F, PF, dmd, V, A, THD, etc.	RS485 Modbus	Single Tariff
SDM630-MB	kWh/kVAh, kW/kVA, kVA, P, F, PF, dmd, V, A, THD, etc.	Mbus EN13757-3	Single Tariff
SDM630-MT	kWh/kVAh, kW/kVA, kVA, P, F, PF, dmd, V, A, THD, etc.	RS485 Modbus	4 Tariffs (RTC)
SDM630-2T	kWh/kVAh, kW/kVA, kVA, P, F, PF, dmd, V, A, THD, etc.	RS485 Modbus	2 Tariffs (dual source)
SDM630-MB-2T	kWh/kVAh, kW/kVA, kVA, P, F, PF, dmd, V, A, THD, etc.	Mbus EN13757-3	2 Tariffs (dual source)

2. Start Up Screens

1.L1_2 MD %IMPORTEXPORT

L1-2 T-88.88

L2-3 Σ-88.88

L3-1 N-88.88

⊗⊙-88.88

MkWh

V%THD

MkVAh

Hz

MkVA

PF Cl C2

The first screen lights up all display segments and can be used as a display check.

50Flt

20

0.104

Software version information

(This information is for reference only, in kind prevail.)

Inst

tEst

PASS

The interface performs a self-test and indicates the result if the test passes.

*After a short delay, the screen will display active energy interface as follows:

0000 kWh

Σ 03.14

Total active energy in kWh.

3. Measurements

The buttons operate as follows:

U/I

BSC

Selects the Voltage and Current display screens. In Set-up Mode, this is the “Left” or “Back” button.

M

▲

Select the Frequency and Power factor display screens. In Set-up Mode, this is the “Up” button.

P

▼

Select the Power display screens. In Set-up Mode, this is the “Down” button.

E

↩

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 U/I button selects a new parameter:

L1

L2

L3

0000 V

Phase to neutral voltages.

*Not available under 3P3W

L1-2

L2-3

L3-1

380.0 V

Phase to phase voltages

*Not available under 1P2W

L1

L2

L3

0000 A

Current on each phase.

N

1.800

A

Neutral current

*Not available under 3P3W, 1P2W.

L1

L2

L3

00.00 V%THD

Phase to neutral voltage

THD%

L1

L2

L3

00.00 I%THD

Current THD% for each phase

3.2 Frequency and Power Factor and Demand

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

Σ

49.98 Hz

0.406 PF

Frequency and Power Factor (total).

L1

L2

L3

1.000 PF

Power Factor of each phase.

*Not available under 3P3W, 1P2W.

L1

L2

L3

9.187 A

Maximum Current Demand.

MD

Σ

-2.464 kW

Maximum Power Demand.

*Hold the M button for 3s to check the COMM. Setting, software version, CRC and full display pages.

3.3 Power

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

L1

L2

L3

0000 kW

Instantaneous Active Power in kW.

*Not available under 3P3W, 1P2W.

L1

L2

L3

0000 kVAh

Instantaneous Reactive Power in kVAh.

*Not available under 3P3W, 1P2W.

L1

L2

L3

0000 kVA

Instantaneous Volt-Amps in KVA.

*Not available under 3P3W, 1P2W.

Σ

0000 kW

0000 kVAh

0000 kVA

Total kW, kVAh, kVA.

3.4 Energy Measurements

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

Σ

0000 kWh

03.14

Total active energy in kWh.

Σ

0000 kVAh

00.00

Total reactive energy

IMPORT

0000 kWh

03.14

Import active energy in kWh.

*Not shown on tariff models.

EXPORT

0000 kWh

00.00

Export active energy in kWh.

*Not shown on tariff models.

T 1

0000 kWh

00.00

Tariff 1~4 active energy

*For SDM630-MT only

Tariff 1~2 active energy

*For SDM630-2T and SDM630-MB-2T

IMPORT

0000 kVAh

00.00

Import reactive energy

*Not shown on tariff models.

EXPORT

0000 kVAh

00.00

Export reactive energy

*Not shown on tariff models.

T 1

0000 kVAh

00.00

Tariff 1~4 reactive energy

*For SDM630-MT only

Tariff 1~2 reactive energy

*For SDM630-2Tand SDM630-MB-2T

DATE

2000

01.01

Date

Hour/month/day.

1st, Jan, 2000 (default)

*For SDM630-MT only

T INNE

00.02

:16

Time

Hour/minute/second

Example:00:02:16

*For SDM630-MT only

Co2

Σ 0000

00.38 k

Carbon emissions

*The parameters of date and time can only be set via RS485 communication.

4. Set Up

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

PASS

0000

Setting up is password-protected. The user must enter the correct password (default '1000') before processing.

PASS

Err

If an incorrect password is entered, the display will show:

PASS Err

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

4.1 Set-up Entry Methods

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

4.1.1 Menu Option Selection

- Use the M and P buttons to scroll through the different options of the set up menu.
- Press E to confirm your selection
- If an item flashes, then it can be adjusted by the M and P buttons.
- Having selected an option from the current layer, press E to confirm your selection.
- Having completed a parameter setting, press U/I to return to a higher menu level. and you will be able to use the M and P buttons for further menu selection.
- On completion of all setting-up, press U/I 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, when 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 M and P buttons
- Press E to confirm each digit setting.
- After setting the last digit, press U/I to exit the number setting routine.

4.2 Communication

4.2.1 RS485 / Mbus Primary Address

*Not for SDM630-P

SET

Addr

001

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

SET

Addr

001

From the set-up menu,press M and P buttons to select the address ID.

SET

Addr

101

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

SET

Addr

101

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

Press E to confirm the setting and press U/I to return to the main set up menu.

4.2.2 Mbus Secondary Address

*For SDM630-MB and SDM630-MB-2T only

-1d-

9999

9999

Secondary address: 00 00 00 01 to 99 99 99 99

From the set-up menu, use M and P buttons to find the setting page.

-1d-

9999

9999

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

-1d-

1193

8171

Use M and P buttons to set the secondary address

Press E to confirm the setting and press U/I 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.

SET

BAUD

9.6 k

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

SET

BAUD

9.6 k

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

SET

BAUD

9.6 k

Use M and P buttons to choose baud rate.

Press E to confirm the setting and press U/I to return to the main set up menu.

4.2.4 Parity

SET

PARI

EVEN

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

SET

PARI

EVEN

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

SET

PARI

NONE

Use M and P buttons to choose parity (EVEN / ODD / NONE).

Press E to confirm the setting and press U/I to return to the main set up menu.

4.2.5 Stop Bits

SET

STOP

2

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

SET

STOP

2

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

SET

STOP

1

Use M and P 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 E to confirm the setting and press U/I to return to the main set up menu.

4.3 Pulse Output

This 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 for:

Toal kWh/Total kVAh
Import kWh/Export kWh
Import kVAh/Export kVAh

SET

PLY

kWh

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

SET

PLY

kWh

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

SET

PLY

kVAh

Use M and P buttons to choose the selection

Press E to confirm the setting and press U/I to return to the main set up menu.

4.3.1 Pulse Rate

Use this to set the energy represented by each pulse. Rate can be set to 1 pulse per dFv0.01/0.1/1/10/100kWh/kVAh.

SET

Rate

10

(It shows 1 pulse = 10kWh/kVAh)

SET

Rate

10

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

Press to enter the selection routine. The current setting will flash. When it's dFt (default), it means 2.5Wh/VArh.

Use and buttons to choose pulse rate, then press to confirm the setting and press to return to the main set up menu.

4.3.2 Pulse Duration

The pulse width can be selected as 200, 100 (default) or 60ms.

(It shows pulse width of 100ms)

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

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

Use and buttons to choose pulse rate, then press to confirm the setting and press to return to the main set up menu.

4.4 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.

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

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

Use and buttons to select the time required. Press to confirm the selection.

Press to exit the DIT selection routine and return to the menu.

4.5 Backlit Set-up

Backlit lasting time is settable, default lasting time is 60minutes

it is set as 5, the backlight will be off in 5 minutes if there is no more further operation.

Press to enter the selection routine. The current time interval will flash. The options are: 0 (always on) / 5 / 10 / 30 / 60 / 120

Press and to select the time interval. Then press to confirm the set-up.

4.6 Supply System

The unit has a default setting of 3 phase 4 wire (3P4W). Use this section to set the type of electrical system.

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

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

Use and buttons to select the required system option: 1P2 (W), 3P3 (W), 3P4 (W). Press to confirm the selection.

Press to exit the system selection routine and return to the menu.

4.7 CO2 Setup

Long press button to enter the CO2 setup.

Press button and to set up the CO2 rate. Default: (0.5703)

4.8 CLR

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

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

Press to enter the selection routine. The MD will flash.

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

4.9 Change Password

Use the and buttons to choose the change password option.

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

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

Repeat the procedure for the remaining three digits. After setting the last digit, Press to confirm the selection.

Press to exit the number setting routine and return to the Set-up menu.

5. Specifications

5.1 Measured Parameters

The unit can monitor and display the following parameters of a single phase two wires (1P2W), three phase three wires (3P3W) or three phase four wires (3P4W) system.

5.1.1 Voltage and Current

- Phase to neutral voltages 176 to 276V a.c. (not for 3p3w supplies).
- Voltages between phases 304 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 99999 W
- Reactive power 0 to 99999 VA
- Volt-amps 0 to 99999 VA
- Maximum demanded power since last reset
- Maximum neutral demand current, since the last reset (for three phase supplies only)

5.1.3 Energy Measurements

- | | |
|--------------------------|----------------------|
| • Import active energy | 0 to 999999.99 kWh |
| • Export reactive energy | 0 to 999999.99 kVArh |
| • Import active energy | 0 to 999999.99 kWh |
| • Export reactive energy | 0 to 999999.99 kVArh |
| • Total active energy | 0 to 999999.99 kWh |
| • Total reactive energy | 0 to 999999.99 kVArh |

5.2 Measured Inputs

Voltage inputs through 4-way fixed connector with 25mm² 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.

Voltage AC (Un)	3x230(400)V
Voltage Range	80~120% Un
Base Current (Ib)	10A AC
Max. Current (Imax)	100A AC
Min. Current (Imin)	0.3A
Starting current	0.4% of Ib
Power consumption	≤ 2W/10VA for the voltage measuring circuit ≤ 4VA for the current measuring circuit

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 or 0.5 IEC62053-21; Class B or C EN50470-3:2022 (MID version) |
| • Reactive energy (VArh) | Class 2 IEC 62053-23 |
| • Response time to step input | 1s, typical, to >99% of final reading, at 50 Hz. |

5.4 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) |
| • Magnetic field of external origin | Terrestrial flux |

5.5 Environment

- | | |
|-------------------------|---------------------------------|
| • Operating temperature | -40°C to + 70°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 |

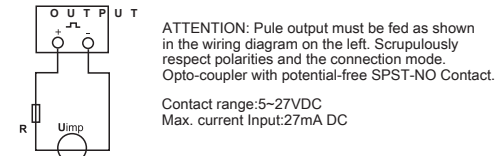
*** Maximum operating and storage temperatures are in the context of typical daily and seasonal variation.**

5.6 Mechanics

- | | |
|-----------------------|---|
| • DIN rail dimensions | 72 x 100 mm (WxH) per DIN 43880
DIN rail (DIN35mm) |
| • Mounting | IP51 (indoor) |
| • Ingress protection | Self-extinguishing |
| • Material | UL94 V-0 |

5.7 Pulse output

The meter is equipped with pulse output, 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.



The unit provides two pulse outputs. Both pulse outputs are passive type. Pulse output 1 is configurable. The pulse output can be set to generate pulses to represent total kWh or kVAh. The pulse constant can be set to generate 1 pulse per: 0.01 = 10 Wh/VArh 0.1 = 100 Wh/VArh 1 = 1 kWh/kVArh 10 = 10 kWh/kVArh 100 = 100 kWh/kVArh 1000 = 1000 kWh/kVArh

Pulse width: 200/100(default)/60ms
Pulse output 2 is non-configurable. It is fixed at total kWh. The constant is 400imp/kWh.

5.8 RS485 Serial-Modbus RTU

***Not For SDM630-P, SDM630-MB or SDM630-MB-2T**
RS485 serial port with Modbus RTU protocol to provide a means of remotely monitoring and controlling the unit. Set-up screens are provided for setting up the RS485 port.

5.9 Mbus

***For SDM630-MB and SDM630-MB-2T only**
This uses a MBus port with EN13757-3 protocol to provide a means of remotely monitoring and controlling the unit. Set-up screens are provided for setting up the MBus port.

***If the Modbus / Mbus protocol document is required, please contact contact Eastron for it.**

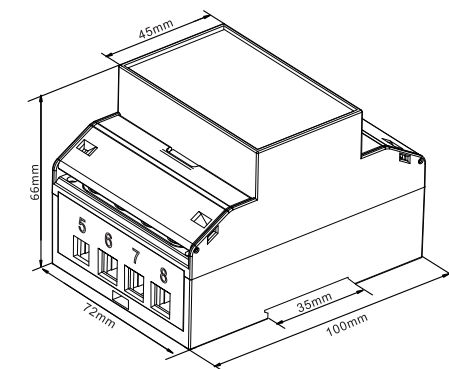
5.10 Dual Power Source

***For SDM630-2T and SDM630-MB-2T only**
The meter can measure energy from two different power supplies. For example, when public grid is power off and electric generator is on, the meter switches to tariff 2 measurement automatically. The meter can also be used as a tariff meter. The tariff is controlled by an external time relay. Itself doesn't measure or record time information.

5.11 Multi-tariffs by RTC

***For SDM630-MT only**
The internal clock circuit of this unit has time automatic switching function. Date, clock and rate can be set and adjusted through RS485, at least 4 tariffs and 8 time segments can be set within a natural day.

6. Dimensions



7. Installation

7.1 Safety Instruction

Information for Your Own Safety

Important safety information is contained in the maintained section. Familiarize yourself with this information before attempting installation or other procedures. Symbols used in this documents:

Risk of Danger
This means to call attention to a high risk, for example: "High voltage". 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. The installer is responsible for coordinating the rating and the characteristics of the supply side overcurrent protection devices with the maximum current rating and, in the case of direct connected meters, with the UC rating of the metering equipment.

Proper Handling

The equipment (device, module) may only be used for the application specified in the catalogue and the user manual, and only be connected with devices and components recommended and approved by EASTRON.

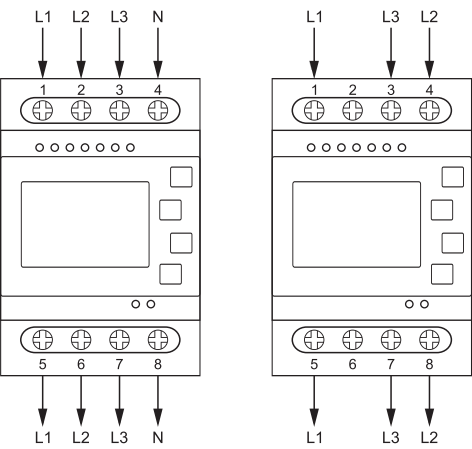
- The unit does not have internal fuses therefore external fuses must be used for protection and safety under fault conditions.
- Use only insulating tools.
- Do not connect while circuit is live (hot).
- Place the meter only in dry surroundings.
- Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- Make sure the used wires are suitable for the maximum current of this meter.
- Make sure the AC wires are connected correctly before activating the current/voltage to the meter.

- Do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you may get an electrical shock.
- Make sure the protection cover is placed after installation.
- Installation, maintenance and reparation should only be done by qualified personnel.
- Never break the seals and open the front cover as this might influence the functionality of the meter, and will avoid any warranty.
- Do not drop, or allow physical impact to the meter as there are high precision components inside that may break.
- An external switch or circuit-breaker should be installed on the power supply wires, which will be used to disconnect the meter and the device supplying energy. It is recommended that this switch or circuit-breaker is placed near the meter because that is more convenient for the operator. The switch or circuit-breaker must comply with the specifications of the building's electrical design and all local regulations

7.2 Maintance

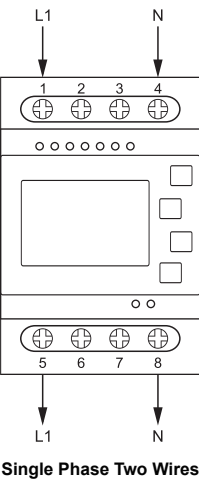
In normal use, little maintenance is needed. As appropriate for service conditions, isolate electrical power, inspect the unit and remove any dust or other foreign material present. Periodically check all connections for freedom from corrosion and screw tightness, particularly if vibration is present. The front of the case should be wiped with a dry cloth only. Use minimal pressure, especially over the viewing window area. If necessary wipe the rear case with a dry cloth. If a cleaning agent is necessary, isopropyl alcohol is the only recommended agent and should be used sparingly. Water should not be used. If the rear case exterior or terminals should be contaminated accidentally with water, the unit must be returned to EASTRON for inspection and testing.

8. Wiring Diagram



Three Phase Four Wires

Three Phase Three Wires

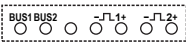


Single Phase Two Wires

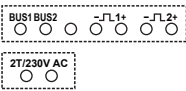
*** For reverse wiring needs, kindly notify our sales team before placing an order**

8.1 Definitions of Other Terminals

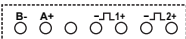
SDM630-MB



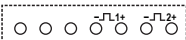
SDM630-MB-2T



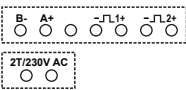
SDM630-M / SDM630-MT



SDM630-P



SDM630-2T



8.2 Terminals Capacity and Screw Torque

Terminals		
COMM/Pulse/2T	0.5~1.5mm ²	0.2Nm
Load	4~25mm ²	2.5~3Nm

VCX POWER

Biuro: Plac Wolnica 13/10 31-060 Kraków,
www.vcx.com.pl, email: biuro@vcx.com.pl