SDM630MCT-LoRaWAN

DIN Rail Smart Energy Meter for Long Range Wireless Communication

USER MANUAL

2020 V1.0

Contents

1 Introduction

This document provides operating, maintenance and installation instructions .

The unit measures and displays the characteristics of single phase two wire(1p2w) , single phase three wire(1p3w), three phase three wire(3p3w,) and three phase four wire(3p4w) supplies, including KWh, kVArh, kW, kVAr, kVA, PF, Frequency, Voltage, Current, dmd. THD etc. Energy is measured in terms of kWh, kVArh. Maximum demand current can be measured over preset periods of up to 60minutes.

The requisite current input(s) are obtained via current transformers (CT). This meter can be configured to work with a wide range of CTs, giving the unit a wide range of operation. Configuration is password protected.

This unit has a built-in LoRaWAN module which allows long range wireless communication. Two pulse outputs are available for real time energy measurement.

1.1 Unit Characteristics

The Unit can measure and display:

- Line voltage and THD% (total harmonic distortion) of all phases
- Line Frequency
- Currents, Current demands and current THD% of all phases
- Power, maximum power demand and power factor
- Active energy imported and exported
- Reactive energy imported and exported

The unit has password-protected set-up screens for:

- Changing password
- Supply system selection 1p2w, 1p3w, 3p3w, 3p4w
- Demand Interval time, backlight time
- Reset for demand measurements
- Pulse output type/ duration
- Current inputs correction

1.2 CT Ratio

The unit can be configured to operate with different ratio of CTs. The Primary current can up to 9999A. The secondary CT has two options: 1A/5A

1.3 Pulse outputs

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/ import/ export kWh or kVArh.

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 to total kWh. The constant is 3200imp/kWh.

1.4. LoRaWAN Classes

Eastron LoRaWAN energy meter is implement Class C functionality. The device will upload message after receiving the data sent from the network.

1.5 Active Upload Mode

The device also can be customized to active upload mode. Total 30 parameters can be set for automatic uploading.
Interval time can be set from 0 to 255 through communication. 0 means the function is OFF. If there are many parameters, the interval shouldn't be set too short in case of conflicting on data uploading.
The meter will upload automatically once it joins the network. And after the interval time, it will upload again.
The interval time is calculated since the last data uploading. Sometimes the interval time may have around 1-2 minutes difference due to the timer error.

1.6 Join

The unit uses standard LoRaWAN protocol for long range communication. Before Communication, the meter has to join the LoRaWAN network first.
There are two Activation Ways for Joining: OTAA(Over-the-Air Activatioin) and ABP(Activation by Personalization).

To ensure the meter join gateway successfully, below information must be confirmed:

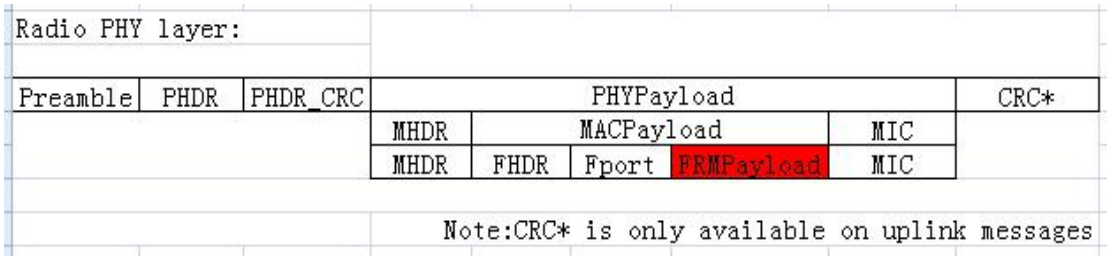
I. DevEui, AppEui, Appkey or DevAddr, NwkSKey, AppSKey information are correctly recorded into the gateway.
II. The Uplink and downlink frequency are same as the gateway.
III. RX2 (frequency and SF) information are same as the gateway.

If the Join delay function is ON, the meter will join the network with a few seconds delay by random.

1.7 Communication

LoRaWAN meter communicate based on international general purpose protocol. The communication data is placed in data segment of LoRaWAN protocol, they will be appointed follow the specified command format.

The format of standard LoRaWAN is shown below:



The following description of the text is defined the data in the segment of FRMPayload region in LoRaWAN protocol. The software in PC only need to get this part of data from gateway. According to the following protocol definition to parse the data.

The data format and encoding of meter communication protocol are modified based on the Modbus ASCII transmission mode. Remove the start and end characters from the Modbus ASCII transmission mode and change LRC validation to CRC validation.

Encoding of data: communication data is encoded with ASCII, and each byte of data is sent with two ASCII characters.
E.g.: a byte data 0x5b is encoded as two characters: 0x35 and 0x62 (ASCII code 0x35= "5", 0x62= "b")

Command format definition:
I: The data format of the gateway sending the copy command:

Reserved	Function Code	The first Address of The Register to Read Data	The Number of Registers to Read Data	CRC Check Codes
1byte	1byte	2byte	2byte	2byte

Note: the reserved bit is fixed as 0x01

II: the data format returned by the meter after receiving the copy command:

Reserved	Function Code	The Length of Data Returned	Specific Data Returned by The Meter	CRC Check Codes
1byte	1byte	1byte	N byte	2byte

Note: the reserved bit is fixed as 0x01

III: Note: the above commands need to be ASCII, so 1byte data will have 2 characters.

E.g.
1). Suppose to read the current data of the meter L1, the data sent by the gateway is the ASCII coded data as shown in the following table:

Reserved		Function Code		The first Address of The Register to Read Data				The Number of Registers to Read Data				CRC Check Codes				
0x01		0x04		0x00		0x06		0x00		0x02		0x91		0xca		Hexadecimal Data
0x30	0x31	0x30	0x34	0x30	0x30	0x30	0x36	0x30	0x30	0x30	0x32	0x39	0x31	0x63	0x61	ASCII Coded Data
"0"	"1"	"0"	"4"	"0"	"0"	"0"	"6"	"0"	"0"	"0"	"2"	"9"	"1"	"c"	"a"	ASCII Character

Note: the first address of the register of the meter L1 current is 00 06 and the number of registers is 2.

2) After receiving the above command, the meter will return the current L1 current data of the meter, as shown in the following table after ASCII coding.

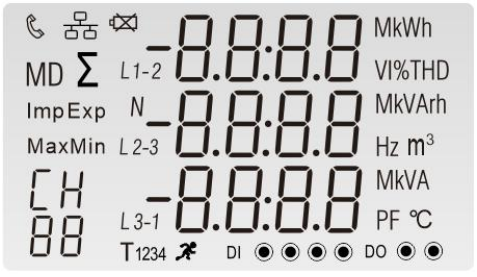
Reserved		Function Code		The Length of Data Returned		current L1 current data of the meter								CRC Check Codes				
0x01		0x04		0x04		0x40		0xa0		0x00		0x00		0xee		0x66		Hexadecimal Data
0x30	0x31	0x30	0x34	0x30	0x30	0x34	0x30	0x61	0x30	0x30	0x30	0x30	0x30	0x65	0x65	0x36	0x36	ASCII Coded Data
"0"	"1"	"0"	"4"	"0"	"0"	"4"	"0"	"a"	"0"	"0"	"0"	"0"	"0"	"e"	"e"	"6"	"6"	ASCII Character

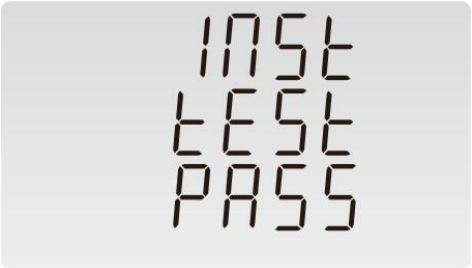
Note: Assume that the current meter's L1 current is 5.0A, since the data is in floating point format, the Hex data is converted to 0x40, 0xa0, 0x00 and 0x00.

To ensure the successful communication, below information must be confirmed:

1. The command is sent through Class C mode.
2. The command is sent in ASCII format.

2. Start Up Screens

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

	The second screen indicates the firmware version. (left picture is for reference only)
	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.

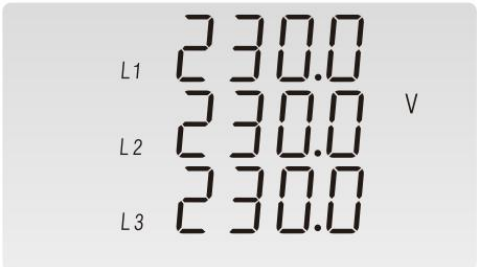
3. Measurements

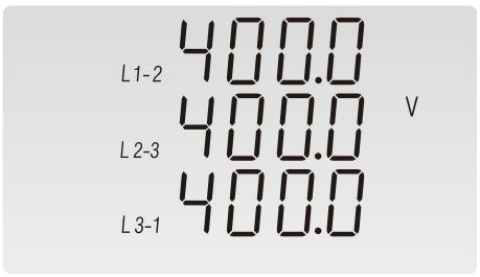
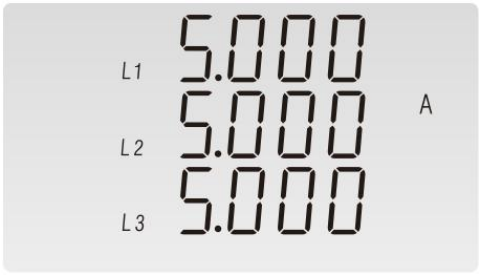
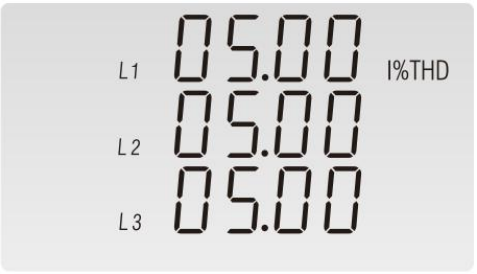
The buttons operate as follows:

	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

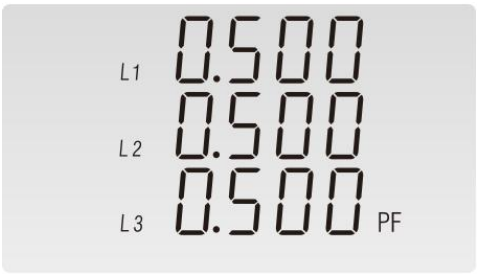
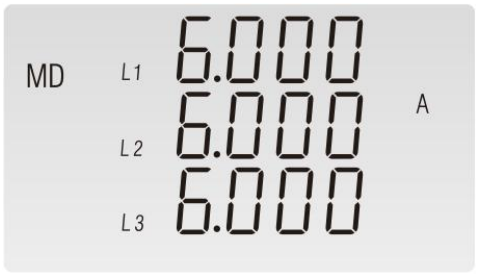
Each successive pressing of the  button selects a new range:

	Phase to neutral voltages

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

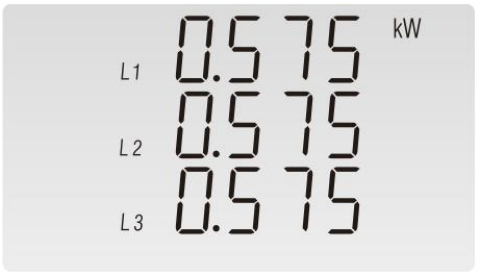
3.2 Frequency and Power factor and Demand

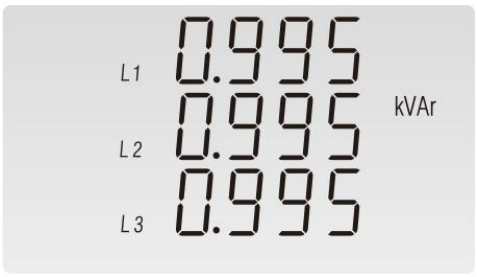
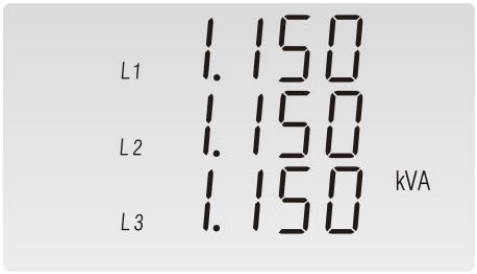
Each successive pressing of the  button selects a new range:

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

3.3 Power

Each successive pressing of the  button select a new range:

	Instantaneous Active Power in kW

	Instantaneous Reactive Power in kVAr
	Instantaneous Volt-amps in KVA
	Total kW, kVArh, kVA

3.4 Energy Measurements

Each successive pressing of the  button selects a new range:

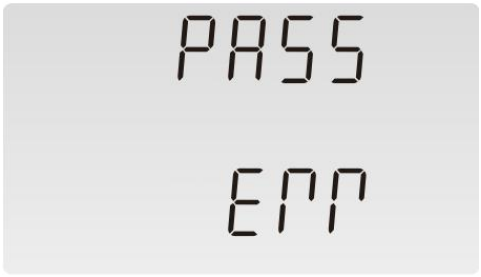
	Total active energy in kWh
	Imported active energy in kWh Total reactive energy in kVArh

	Imported active energy in kWh
	Exported active energy in kWh
	Imported reactive energy in kVArh
	Exported reactive energy in kVArh
	Meter ID (Serial Number)

4. Setting Up

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

Setting up is password-protected so you must enter the correct password before processing. If an incorrect password is entered, the display will show: PASS Err



To exit setting-up mode, press U/I ESC 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 M and P buttons to select the required item from the menu shown in section 4.1.

2) Press E to confirm your selection

3) If an item flashes, then it can be adjusted by the M and P buttons. If not, there maybe a further layer.

4) Having selected an option from the current layer, press E to confirm your selection.

5) Having completed a parameter setting, press U/I ESC to return to last menu. and you will be able to use the M and P buttons for further menu selections.

6) After completing all setting-up, press U/I ESC repeatedly until exit the setting mode.

4.1.2 Number Entry Procedure

When Setting up the unit, some screens require the entering of a number. E.g. the setting of password. Digits are set individually, from left to right. The procedure is as below:

1) Use the M and P buttons to select the required item from the menu shown in section 4.1.

2) Press E for 3s to confirm your selection

3) The current digit to be set flashes and press the M and P button to choose the required digit.

4) Press E to move to the next digit.

5) After setting the last digit, press E for 3s to confirm your setting. And press U/I BSC repeatedly until exit the setting mode.

4.2 Setting 1

Input Password "1000", press E for 3s to enter into the setting up page.

4.2.1 CT2

	Use M and P to find the secondary current input setting. Options: 5A or 1A Default CT2: 5A
	Press E for 3s, the current digit will flash. Press M or P to choose the selection.
	Press E for 3s to confirm.

Press U/I ESC to exit the setting mode

4.2.2 CT1

	Use M and P to find the primary current input setting. Options: 1-9999A Default CT1: 5A
	Press E for 3s, the current digit will flash. Press M or P to choose the selection.
	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

4.2.3 PT2

	Use M and P to find the PT set up menu. Options: 30-500V Default PT2: 230V under 3P4W mode 400V under 3P3W mode
	Press E for 3s, the current digit will flash. Use M , P and E to select PT2.

	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

4.2.4 PT1

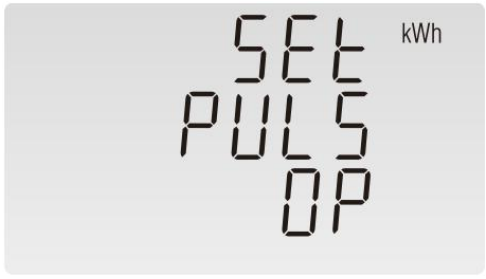
	Use M and P to find the PT set up menu. Options: 30-9999V Default PT1: 230V
	Press E for 3s, the current digit will flash. Use M , P and E to select PT2.
	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

Note:

The PT option sets the Primary voltage and secondary voltage of the voltage transformer (PT) that give into the meter.

For example: if the PT connect to the meter is 5000/100V (Primary voltage is 5000V, secondary voltage is 100V

4.2.5 Pulse Output Type:

	Pulse Output Type Default: kVArh Range: kVArh, imp kVArh, Exp kVArh, kWh, Exp kWh, imp kWh.
	Press E for 3s, the red part will flash. Press M or P to choose the required selection.
	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

4.2.6 Pulse Constant

Use this to set the energy represented by each pulse

	Pulse Constant Default: 0.01 kWh Range: 0.001/ 0.01/ 0.1/1 / 10/ 100/ 1000 kWh (left picture means 1 impulse = 10 kWh/kVArh)
	Press E for 3s, the red part will flash. Press M or P to choose the required selection.

	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

4.2.7 Pulse Duration

	Pulse Duration Default: 200 Range: 60/ 100/ 200 mS
	Press E for 3s, the red part will flash. Press M or P to choose the required selection.
	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

4.2.8 Demand Interval Time (DIT)

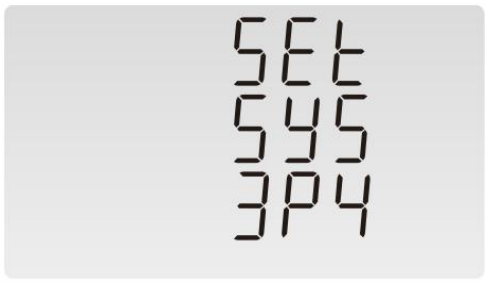
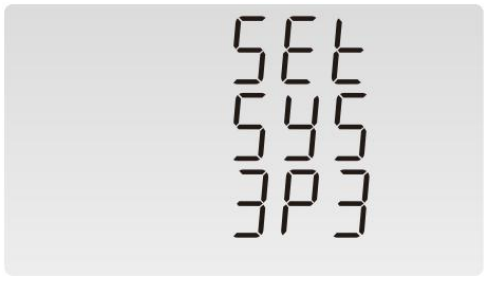
	The screen will show the currently selected integration time. Default: 60 Range: 60/ 30/ 20/ 15/ 10/ 8/ 5/ 0.

	Press E for 3s, the current demand interval time will flash. Press M or P to choose the required selection.
	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

4.2.9 Backlight Time (LP)

	The screen will show the currently selected backlight time. Default: 60 minutes Range: 120/ 60/ 30/ 10/ 5/ON/ OFF If it is seated as 5, the backlit will be off in 5 minutes. If it is set as ON, the backlit will always be on.
	Press E for 3s, the current backlight time will flash. Press M or P to choose the required selection.
	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

4.2.10 System

	The screen shows the currently selected power supply is three phase four wire. Default: 3P4W Range: 1P2W/ 1P3W/ 3P3W/ 3P4W
	Press E for 3s, the current system type will flash. Press M or P to choose the required system.
	Press E for 3s to confirm.
Press U/I BSC to exit the setting mode	

4.2.11 Clear Demand Information

This option is to reset the demand information. It would reset current and power demand information.

	From the Set-up menu, use M and P buttons to select the reset option.
	Press E for 3s to enter the selection routine. The MD will flash. Press E again for 3s to confirm the resetting.

Press U/I ESC to exit the setting mode

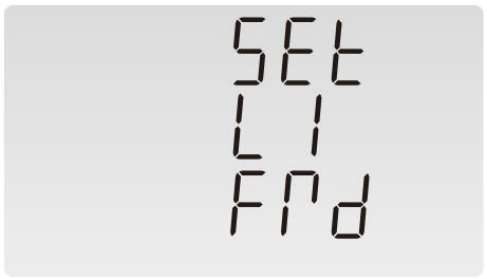
4.2.12 Password

	The screen shows the current password. Default: 1000 Range: 0001-9999
	Press E for 3s, the current digit will flash. Press M or P to choose the required digit, press E to move to the next digit.
	Press E for 3s to confirm.
Press U/I ESC to exit the setting mode	

4.2.13 System Connect

This unit provides a function with Reverse connected current inputs correction setting.

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

	Press E for 3s to enter the Phase 1 correction. Options: Frd (forward) and rEv (reverse) The default is FRD (forward)
	Press E again for 3s, the current “Frd” will flash. Use M and P to choose the option.
	Press E for 3s to confirm
	Press P to move to the phase 2 or phase 3 correction. Same operation as phase 1.
Press U/I ESC to return to the previous setting page. Press again to exit the setting mode	

4.2.14 Checking Meter Information

This function allows to check meter setting information, also some of below information can be set through another password (refer to section 4.3).

1) Join Information

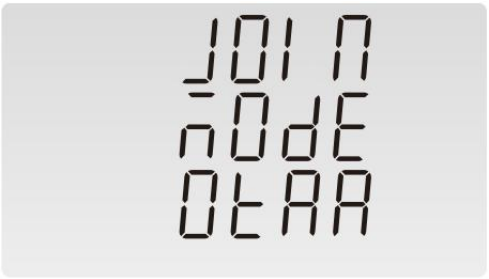
1		Activation Way： OTAA DevEui: end-device identifier **********(16 digits)

1-1		Activation Way：ABP DevAddr: End-device address ********(8 digits)
2		Activation Way：OTAA AppEui: application identifier **********(16 digits)
2-1		Activation Way：ABP NwkSKey: Network session key **********(32 digits)
3		Activation Way：OTAA AppKey: Application key **********(32 digits)
3-1		Activation Way：ABP AppSKey: Application session key **********(32 digits)

2) Join Status

1		JOIN OK Means the meter is connected to the gateway successfully
1-1		JOIN FAIL Means the meter is failed to connect to the gateway Meanwhile, the display will show EER1
1-2		JOIN WAIT Means the meter is in the process of joining.

3) Join Mode

1		JOIN MOdE: OTAA
1-2		JOIN MOdE: Abp

4) AUTO

When AUTO function is ON, the meter will send a command to gateway automatically to check the connection status with gateway. Interval time is configurable.

1		AUTO
1-2		UP LOAd: ON Means AUTO function is open, otherwise it will show OFF
1-3		Interval Time Option: 5/ 10/ 20/ 30/ 90/ 120/ 150/ 180/ 210/ 240 minutes

5) Meter ID

1		Meter ID/ Serial Number ********(8 digits)

4.3 Setting 2

Input Password “6308”, press  and  together for 3s to enter the setting up page.

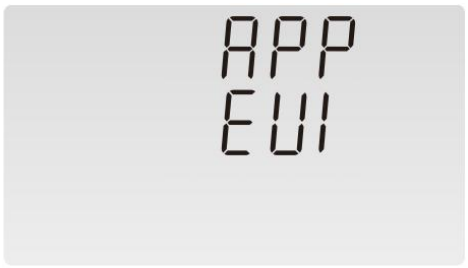
The first page will show join status between the meter and gateway. Use  and  to choose the options required.

Below information can be adjusted through password “6308”:

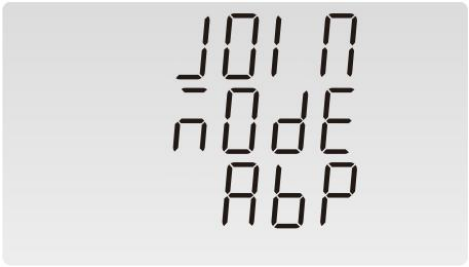
4.3.1 Join Information:

Join information including DevEui, AppEui, Appkey under OTAA mode and DevAddr, NwkSKey, AppSKey under ABP mode.

Take OTAA setting as an example:

	DevEui: 9132000001324013 The 16 digits will be shown on 2 pages. Each page shows 8 digits. Press E for 3s, enter into the P1 setting page.
	Press E for 3s, the first digit will flash. Use M, P and E to choose the option. Press E for 3s again to confirm the setting.
	Press P to move to the P2 setting page. Use M, P and E to do the same opeation as P1.
	After P2 setting, Press U/I ESC return to the DevEui page, press P move to the next setting page: AppEui and Appkey. Use the same way to set AppEui and Appkey.
	After above setting, Press U/I ESC return to the main setting page. Press P to move to the SAVE page. Long Press E button for twice to save above setting.

4.3.2 Join Mode: OTAA/ ABP

	Join mode Option: OTAA, ABP
	Press E for 3s, the current option will flash. Use M and P to choose the option.
	Press E for 3s to confirm.

4.3.3 Re-Join

	Re-Join This function allows the meter re-join the network when disconnected.
	Press E for 3s, the current option will flash. Long press E again, the meter will re-join the network automatically.

4.3.4 Auto: Upload ON/OFF, Upload Interval Time

When Auto is ON, the meter will send a command to gateway automatically. This is for the gateway to check if the meter is still online.

Under Active upload mode, the Auto function is not used.

	From the Set-up menu, use M and P buttons to select the AUTO option. Press E for 3s enter to the setting page.
	UP LOAd: ON Range: ON/OFF Press E for 3s, the current option will flash. Use M or P to choose the option.
	Press E for 3s to confirm.
	Interval Time Option: 5/ 10/ 20/ 30/ 90/ 120/ 150/ 180/ 210/ 240 minutes 05 means the meter will send a command to gateway every 5 minutes.
	Press E for 3s, the current option will flash. Use M or P to choose the option.

	Press E for 3s to confirm.

4.3.5 Join Delay

When Join delay function is ON, the meter will join the LoRaWAN network with a few seconds delay after booting.
When Join delay function is OFF, the meter will join the LoRaWAN network once the power is on.

	From the Set-up menu, use M and P buttons to select the JOIN DLY option. Press E for 3s enter to the setting page.
	UP LOAd: ON Range: ON/OFF Press E for 3s, the current option will flash. Use M or P to choose the option.
	Press E for 3s to confirm.

4.3.6 OFF Line

This function is used to check the connection status between meter and the netwrok/gateway.
To check the connections, the network will send data to the end-device at intervals. If over a period, the meter doesn't receive data from gateway, the meter will be considered OFF line and it will re-join the network.

	OFF Line Option: OFF/ 30/ 60/ 90/ 120/ 150/ 180/ 210/ 240 minutes Default: 60 minutes 60 minutes means from the last message received from gateway, if over 60 minutes not receiving message, the meter will be considered OFFLINE and will re-join the network automatically.
	Press E for 3s, the current option will flash. Use M or P to choose the option.
	Press E for 3s to confirm.

NOTE: Under the active upload mode, the OFF Line time should be set to a value bigger than the active upload interval time.

4.3.7 Confirm Mode

When the Comfirm mode is ON, the meter will request the LoRaWAN network to confirm the reception of its message.
If there is no message received, it means the network has not received the uplink. The Meter will send uplink again, upon to 3 times.

	From the Set-up menu, use M and P buttons to select the Confirm mode option.

	Press E for 3s, the current option will flash. Use M or P to choose the option.
	Press E for 3s to confirm.

5 Specifications

Electrical characteristics			
Type of measurement			RMS including harmonics on three phase AC system (3P, 3P+N)
Measurement accuracy	Active Energy		IEC 62053-21 Class 1
	Reactive Energy		± 0.01
	Frequency		± 0.2%
	Current		± 0.5%
	Voltage		± 0.5%
	Power		± 0.01
	Power Factor		± 0.01
Data Update Rate			1 second nominal
Input-Voltage	VT Primary		30 ~ 500000 Vac
	Un		230 V L-N
	Measured Voltage with Over-range		173 to 480 Vac L-L 100 to 276 Vac L-N
	Impedance		1M Ω
	Frequency Range		45~65Hz
Input- Current	CT Ratings	Primary	1~9999A
		Secondary	1A / 5A
	Measured current with Over-range		5mA~6A
	Withstand		Continuous 8A 120A for 0.5 Seconds
	Impedance		< 1M Ω
	Frequency Range		45~65Hz

	Burden	<0.036VA at 6A
Auxiliary Power Supply	Operating Range	85~275V AC / 120~380V DC
	Power Consumption	< 7VA/3.5W.
	Frequency	45 to 65 Hz
Max. reading		9999999.9 kWh/ kVArh
Mechanical Characteristics		
Weight		300g
IP Degree of Protection (IEC 60529)		IP51 (indoor)
Dimensions (WxHxD)		72x94.5x65mm
Mounting		Din rail (DIN 43880)
Material of meter case		Self-extinguishing UL 94 V-0
Mechanical environment		M1
Environmental Characteristics		
Operating Temperature		-25 to 55°C
Storage Temperature		-40 to 70°C
Humidity Rating		<95% RH at 50 °C (non-condensing)
Pollution Degree		2
Altitude		2000m
Vibration		10Hz to 50Hz, IEC 60068-2-6
Safety		
Measurement Category		Per IEC61010-1 CAT III
Current Inputs		Require external Current Transformer for Insulation
Over voltage Category		CAT III
Dielectric Withstand		As per IEC 61010-1 Double Insulated front panel display
Protective Class		II
Communications		
Interface standard and protocol		LoRaWAN Specification 1.0.2
Frequency		EU868/AS923/AU915/ US902/CN470/CN433
LoRaWAN Classes		Class C
Auto-upload		Max. 30 parameters
Auto-upload Interval		Configurable
Activation Way		OTAA or ABP
Output Power		13dBm in transmission
Coding Format		ASCII
Communication Distance		3000M in an open area

NOTE:

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

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

6 Maintenance

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 thoroughly dried before further use. Should it be suspected that water might have entered the unit, factory inspection and refurbishment is recommended。

In the unlikely event of a repair being necessary, it is recommended that the unit be returned to the factory or nearest Eastron distributor.

7 Installation

7.1 Safety

The unit is designed in accordance with IEC 61010-1:2017 – Permanently connected use, Normal condition. Installation category III, pollution degree 2, basic insulation for rated voltage.

7.2 EMC Installation Requirements

Whilst this unit complies with all relevant EU EMC (electro-magnetic compatibility) regulations, any additional precautions necessary to provide proper operation of this and adjacent equipment will be installation dependent and so the following can only be general guidance:

Avoid routing wiring to this unit alongside cables and products that are, or could be, a source of interference.

The auxiliary supply to the unit should not be subject to excessive interference. In some cases, a supply line filter may be required.

To protect the product against incorrect operation or permanent damage, surge transients must be controlled. It is good EMC practice to suppress transients and surges at the source. The unit has been designed to automatically recover from typical transients; however, in extreme circumstances it may be necessary to temporarily disconnect the auxiliary supply for a period of greater than 10 seconds to restore correct operation.

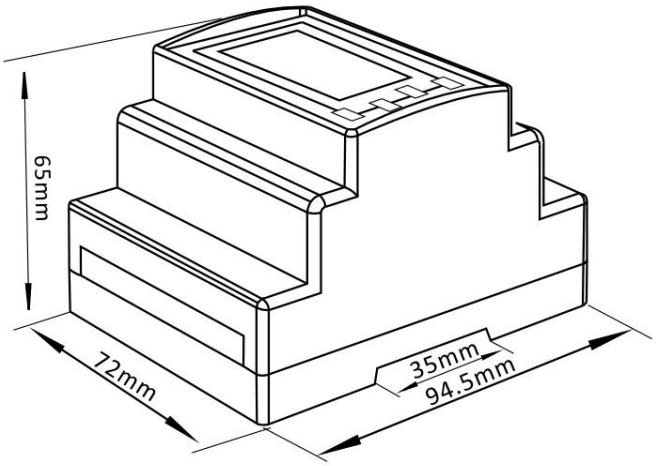
Screened communication leads are recommended and may be required. These and other connecting leads may require the fitting of RF suppression components, such as ferrite absorbers, line filters etc., if RF fields cause problems.

It is good practice to install sensitive electronic instruments that are performing critical functions in EMC enclosures that protect against electrical interference causing a disturbance in function.

Warning 

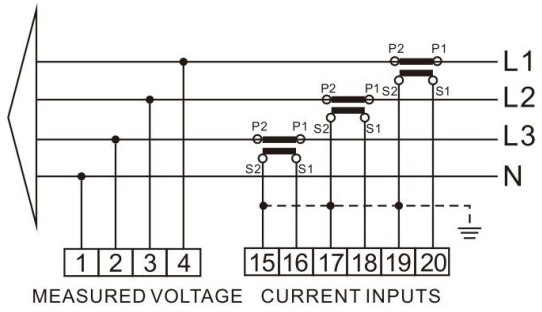
- **During normal operation, voltages hazardous to life may be present at some of the terminals of this unit. Installation and servicing should be performed only by qualified, properly trained personnel abiding by local regulations. Ensure all supplies are de-energized before attempting connection or other procedures.**
- **Terminals should not be user accessible after installation and external installation provisions must be sufficient to prevent hazards under fault conditions.**
- **This unit is not intended to function as part of a system providing the sole means of fault protection - good engineering practice dictates that any critical function be protected by at least two independent and diverse means.**
- **The unit does not have internal fuses therefore external fuses must be used for protection and safety under fault conditions.**
- **Never open-circuit the secondary winding of an energized current transformer.**
- **This product should only be operated with CT secondary connections Earthed.**
- **If this equipment is used in a manner not specified by the manufacturer, protection provided by the equipment may be impaired.**

7.3 Dimensions

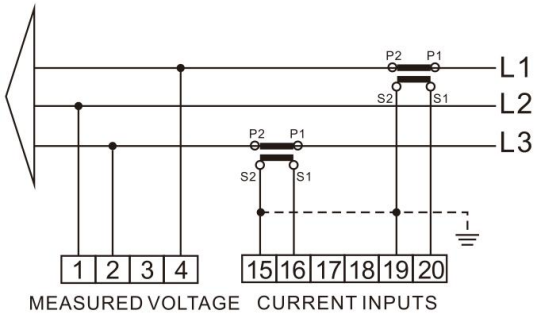


7.4 Wiring Diagram

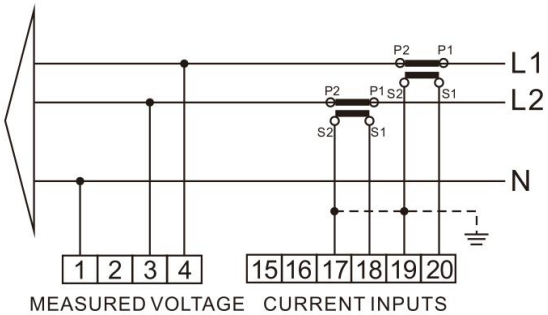
7.4.1 Current and Voltage Input



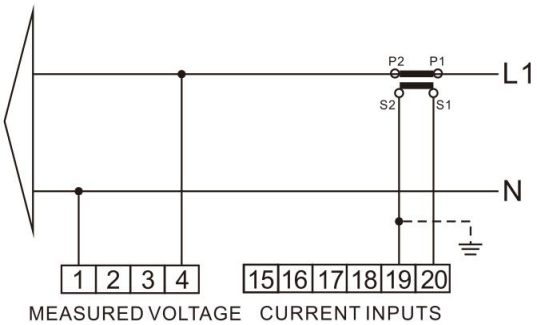
3P4W 3CT



3P3W 2CT

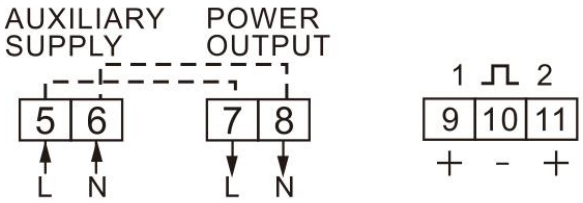


1P3W 2CT



1P2W 1CT

7.4.2 Definitions of Other Terminals



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If you have any question, please feel free to contact us at:

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