SDM630MCT-LR

DIN Rail Smart Energy Meter for Long Range Wireless Communication

USER MANUAL
2026 V1.1

Statements

Eastron reserves the right to amend the product specifications in this manual without prior notice. Before placing an order, please contact our company or local agent to get the latest specifications.

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Version History

Version	Date	Changes
1.0	2025-01-12	Initial issue
1.1	2026-03-24	Update to the new standard version

Risk Information

Information for Your Own Safety

This manual does not contain all of the safety measures for operating the equipment (module, device) for different conditions and requirements. However, it does contain information which you must know for your own safety and to avoid damages. This information is highlighted by a warning triangle, which indicates the degree of potential danger.

Warning

This means that failure to observe the instruction can result in death, serious injury or considerable material damage.

Caution

This means hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

Qualified personnel

Operation of the equipment (module, device) described in this manual must only be performed by qualified personnel. Qualified personnel in this manual means people who are authorized to commission, start up, ground and label devices, systems and circuits in accordance with Safety Regulatory standards.

Proper handling

The prerequisites for perfect, reliable operation of the product are proper transport, storage, installation and operation and maintenance. When operating electrical equipment, some parts of this equipment automatically carry dangerous voltages. Improper handling can therefore result in serious injuries or material damages.

- ✧ Use only insulating tools.
- ✧ Do not connect while circuit is live (hot).
- ✧ Place the meter only in dry surroundings.
- ✧ Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- ✧ Make sure the wires are suitable for the maximum current of this meter.
- ✧ Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- ✧ Do not touch the clamps directly with metal, blank wire or your bare hands as you may get electrical shock.
- ✧ Make sure the protection cover is placed after installation.
- ✧ Installation, maintenance and reparation should only be done by qualified personnel.
- ✧ Never break the seals or open the front cover as this might influence the function, and will void the warranty.
- ✧ Do not drop, or allow strong physical impact on the meter as the high precisely components inside may be damaged.
- ✧ This product is designed to be mounted inside of switchboards or cabinet on DIN rail.
- ✧ This device must have a suitable sized Circuit Breaker feeding the Multi Function Energy Meter so it does not

exceed the maximum rated current.

- ✧ The supply wiring of this device shall be suitable sized cable to match the installed circuit breaker.
- ✧ A Disconnection Device (Circuit Breaker) should be installed close to the Multi Function Energy Meter.
- ✧ The Disconnection Device shall be marked as the Disconnection Device for the Multi Function Energy Meter.

Disclaimer

We have checked the contents of this publication and every effort has been made to ensure that the descriptions are as accurate as possible.

However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors contained in the information given. The data in this manual is checked regularly and the necessary corrections are included in subsequent editions. We are grateful for any improvements that you suggest.

Chapter 1. Introduction

1.1 Product Introduction

The unit measures and displays the characteristics of single phase two wire(1p2w) , 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 60 minutes.

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.

1.2 Product 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, 3p3w, 3p4w
- Demand Interval time, backlight time
- Reset for demand measurements
- Pulse output type/ duration
- Current inputs correction

1.3 Application Scenarios

Based on LoRaWAN wireless communication technology, the SDM630MCT-LR is suitable for industrial, commercial, new energy, and infrastructure scenarios, addressing the need for long-distance, high-precision collection of multiple power parameters (such as voltage, current, energy, and harmonics) and energy management for distributed equipment without wiring.

Chapter 2. Technical Parameters

2.1 Specifications

Electrical Characteristics		
Type of Measurement		RMS
Measurement Accuracy	Voltage	± 0.2%
	Current	± 0.2%
	Frequency	± 0.05%
	Power Factor	± 0.01
	Active Power	± 0.5%(5%Ib~Imax)
	Reactive Power	± 1%(5%Ib~Imax)
	Apparent Power	± 0.5%(5%Ib~Imax)
	Active Energy	Class 0.5 IEC62053-21 Class C EN50470-3:2022
	Reactive Energy	Class 2 IEC 62053-23
Technical parameters	Voltage AC (Un)	3*230/400VAC
	Voltage Range	100 - 277V AC(L-N) 100 to 480V AC (L-L)
	Frequency	50/60Hz
	Current Input	5A
	Maximum Current	6A
	Minimum Current	0.05A
	Starting Current (Ist)	0.005A
	Transition Current (Itr)	0.25A
	Over Current Withstand	20Imax for 0.5S
	AC Voltage Withstand	4KV/1min
	Impulse Voltage Withstand	6kV – 1.2/50μS waveform
	Voltage Circuit Power Consumption	≤ 2W/10VA
	Current Circuit Power Consumption	≤0.05VA
	Display	LCD with white backlit
Mechanical Characteristics		
Net Weight		≈253g
IP Degree of Protection (IEC 60529)		IP51 Front Display IP20 Whole Meter
Dimensions (WxHxD)		72* 94.5* 65mm
Mounting		DIN Rail 35mm
Material of Meter Case		Self-extinguishing UL 94 V-0
Mechanical Environment		M1
Environmental Characteristics		
Operating Temperature		-40℃ ~ +70℃

Storage Temperature	-40℃ ~ +80℃
Operation humidity	≤90% Non-condensing
Storage humidity	≤95% Non-condensing
Pollution Degree	II
Altitude	≤2000m
Vibration	10Hz ~ 150Hz, IEC 60068-2-6
Electromagnetic Compatibility	
Electrostatic Discharge	IEC 61000-4-2
Immunity to Radiated Fields	IEC 61000-4-3
Immunity to Fast Transients	IEC 61000-4-4
Surge (Impulse) Immunity	IEC 61000-4-5
Conducted Immunity	IEC 61000-4-6
Immunity to Magnetic Fields	IEC 61000-4-8
Immunity to Voltage Dips	IEC 61000-4-11
Radiated Emissions	CISPR 32
Conducted Emissions	CISPR 32
Safety	
Installation Category	CAT III
Over-voltage Category	CAT III
Current Inputs	Require External Current Transformer for Insulation
Protective Class	II
Interface 1	LoRaWan
Interface 1 Protocol	LoRaWAN Specification 1.0.2
Frequency	EU868/AS923/AU915/ US902/CN470/CN433
LoRa WAN Class	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

Technical Standards:

[1] EN IEC61326-1: 2021 Electromagnetic Compatibility Directive - Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

[2] EN IEC 61326-2-3: 2021 Electromagnetic Compatibility Directive

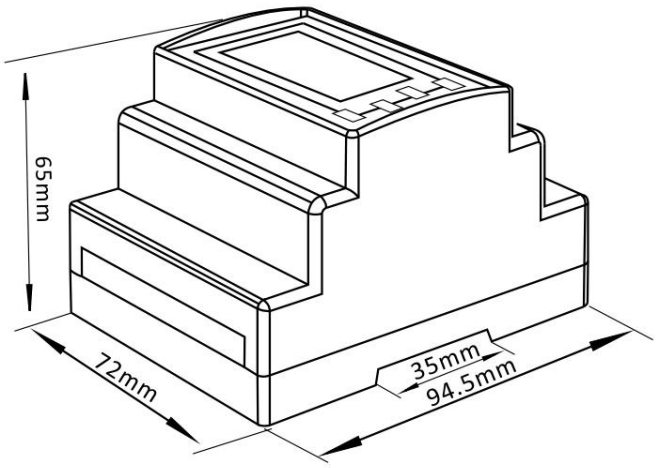
[3] EN61010-1:2010+A1:2019 Low Voltage Directive 2014/35/EU - Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements

[4] EN61010-2-030:2010 Low Voltage Directive 2014/35/EU - Particular requirements for testing and measuring circuits

[5] EN 50470-3:2022 Electricity metering equipment - Part 3: Particular requirements - Static meters for AC active energy (class indexes A, B and C)

[6] EN IEC 62052-11:2021/A11:2022,Electricity metering equipment - General requirements, tests and test conditions - Part 11: Metering equipment
[7] IEC 62052-31:2015 Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 31: Product safety requirements and tests

2.2 Dimensions



Width: 72 mm
Height: 94.5 mm
Depth: 65mm

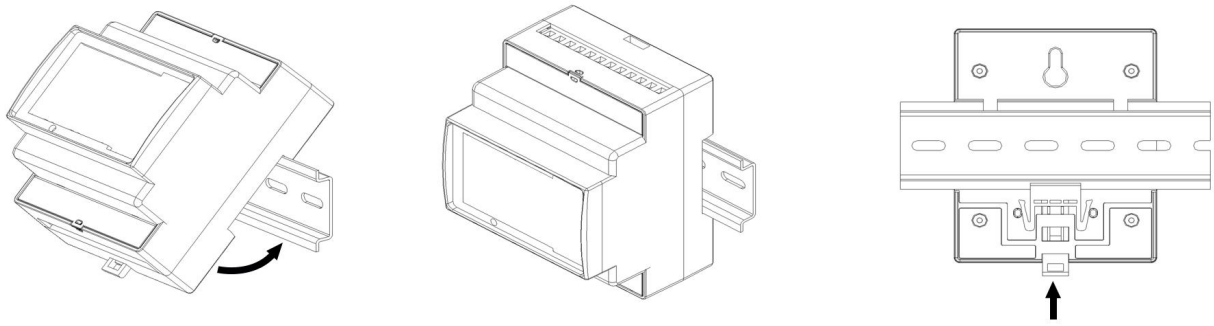
2.3 Mounting

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

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

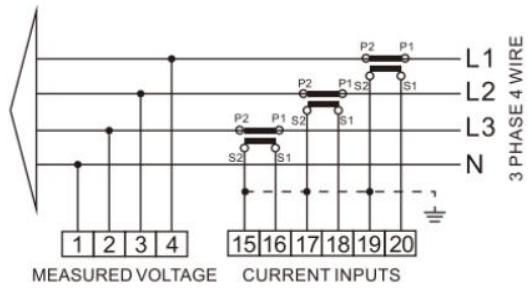
Step 3: Following the direction indicated in Figure 1, engage the lower slot of the DIN rail groove onto the DIN rail until audibly seated (see Figure 2).

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

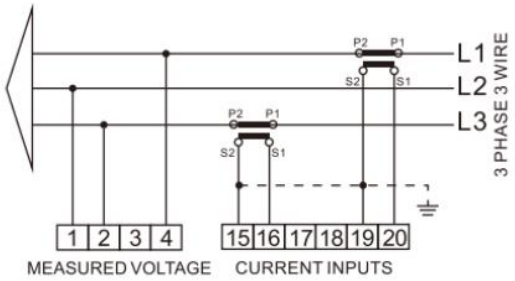


① ② ③

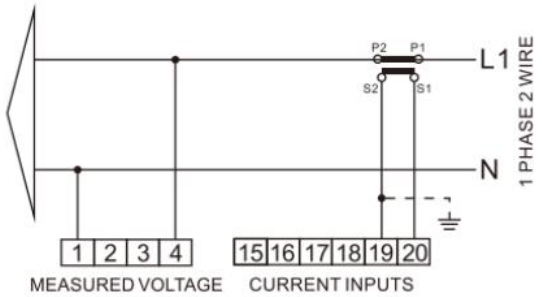
2.4 Wiring Diagram



3P4W 3CTs

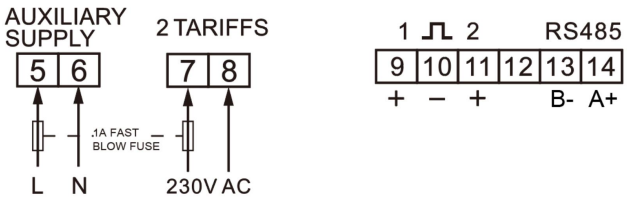


3P3W 2CTs



1P2W(L+N) 1CT

Definitions of Other Terminals



SDM630MCT-LR

Wiring Guide

Terminal ①~⑧	Measurement Connection	Screw Connection
	Strip Length	6-7mm
	Screw	M2.5
	Rigid/Supple	0.5-2.5mm² (22~12AWG)
	Tightening Torque	0.4Nm
	Model	PH0
Terminal ⑨~⑳	Measurement Connection	Screw Connection
	Strip Length	6-7mm
	Screw	M3
	Rigid/Supple	0.5-2.5mm² (30 ~ 14AWG)
	Tightening Torque	0.4Nm
	Model	PH0

Chapter 3. Operation

3.1 Button Functions

The buttons operate as follows:

Button	Short click		Long press (3s)	
	Display mode	Setup mode	Display mode	Setup mode
	V1 V2 V3 V1-2 V2-3 V3-1 I1 I2 I3 IN V %THD I %THD	Return to previous menu		
	Hz PF PF1 PF2 PF3 MD of I1 I2 I3 MD of Power	Previous page or increase value	Auxiliary Mode	
	P1 P2 P3 Q1 Q2 Q3 S1 S2 S3 P-t Q-t S-t	Next page or decrease value		
	Active E-t Reactive E-t Imp Active E Exp Active E Imp Reactive E Exp Reactive E	Move to right side	Enter Setup mode	Confirm setting

3.2 Installation Display

Connect the wire and power on the meter to enter the normal measurement state. The screen display is as follows:

	The first screen lights up all display segments and can be used as a display check.
	The second screen and the third screen indicates the firmware installed in the unit. Note： the actual display might be different with the left on here.

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

3.3 Basic information display

3.3.1 Voltage and current

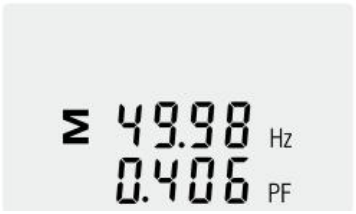
Each successive pressing of the  button selects a new range:

	Phase to neutral voltage (Not available under 3P3W)
	Phase to phase voltage (Not available under 1P2W)
	Current of each phase

	Neutral current (Not available under 3P3W)
	Phase to neutral voltage THD% (Phase to phase voltage THD% under 3P3W)
	Phase current THD%

3.3.2 Frequency, Power factor and Demand

Each successive pressing of the  button selects a new range:

	Frequency and Power Factor (total)
	Power Factor of each phase (Not available under 3P3W &1P2W)

	Maximum current demand of each phase
	Maximum total power demand

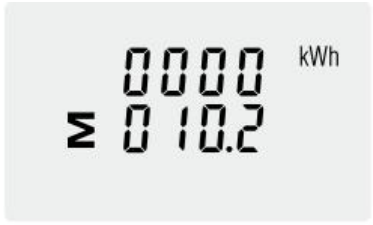
3.3.3 Power

Each successive pressing of the  button select a new range:

	Instantaneous Active Power in kW (Not available under 3P3W &1P2W)
	Instantaneous Reactive Power in kVAr (Not available under 3P3W &1P2W)
	Instantaneous Volt-amps in kVA (Not available under 3P3W &1P2W)
	Total W, VAr, VA

3.3.4 Energy

Each successive pressing of the  button shows following measurements:

	Total 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)

3.4 Auxiliary information display

Each successive Long pressing of the  button enter the auxiliary:

	Current Transformer 2
	Current Transformer 1
	Potential Transformer 2
	Potential Transformer 1

	CRC
	Initial Screen

3.5 Setup Mode 1

The meter's settable parameters are password protected. Each successive Long pressing on the E button to enter setup mode. 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.

3.5.1 Menu Option Selection

1.Use the M and P buttons to scroll through the different options of the set up menu.

2.Long 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, long press E to confirm your selection.

5.Having completed a parameter setting, press U/I to return to a higher menu level.

You will be able to use the M and P buttons for further menu selection.

6.On completion of all setting-up, press U/I repeatedly until the measurement screen is restored.

3.5.2 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：

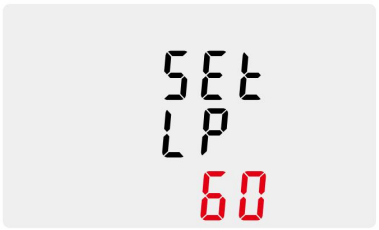
1.The current digit to be set flashes and is set using the M and P buttons.

2.Short press  to confirm the digit setting and remove to the next.

3.After setting the last digit, long press  to confirm the setting.

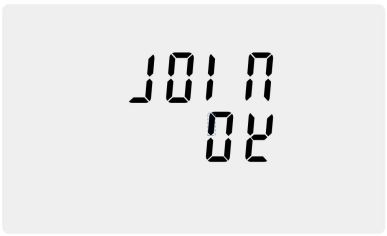
4.Press  to return to a higher menu level.

page	Settings interface	Set status	Optional configuration
1			**Password** Default: 1000
2			**CT2 setting** Option: 1, 5A Default: 5A
3			**CT1 setting** Range: 1. 0001~9999(CT2 = 1) 2. 0001~9999(CT2 = 5) Default: 0005
4			**PT2 setting** Range: 100~500V Default: 230V under3P4W mode; 400V under 3P3W mode
5			**PT1 setting** Range: PT2~9999V Default: 400V

6			**Pulse output setting** Option: kWh, kVArh Default: KVArh
7			**Pulse rate setting** Option: 0.01, 0.1, 1, 10, 100, 1000 kWh/kVArh per imp Default: 0.01 kWh/kVArh per imp
8			**Pulse duration setting** Option: 200, 100, 60 ms Default: 200ms
9			**Demand interval time setting** Option: 0, 5, 8, 10, 15, 20, 30, 60min Default: 60min
10			**Backlit time setting** Range: 0~121 Default:60
11			**System type setting** Option: 3P4W, 3P3W, 1P2W Default: 3P4W
12			**CLR max demand setting**

13		 	**Activation Way：OTAA** DevEui: ********** The 16 digits will be shown on 2 pages. Each page shows 8 digits.
13-1			**Activation Way：ABP** DevAddr: End-device address ********(8 digits)
14		 	**Activation Way：OTAA** AppEui: **----------** The 16 digits will be shown on 2 pages. Each page shows 8 digits.
14-1			**Activation Way：ABP** NwkSKey: Network session key **----------**

			The 32 digits will be shown on 4 pages. Each page shows 8 digits. ***(32 digits)
			
			
15		Same as the above interface display	**Activation Way：OTAA** AppKey: Application key 105880********** *****123456(32 digits) The 32 digits will be shown on 4 pages. Each page shows 8 digits.
15-1		Same as the above interface display	**Activation Way：ABP** AppKey: Application key 105880********** *****123456(32 digits) The 32 digits will be shown on 4 pages. Each page shows 8 digits.

16			JOIN OK Means the meter is connected to the gateway successfully
16-1			JOIN FAIL Means the meter is failed to connect to the gateway Meanwhile, the display will show EER1
16-2			JOIN WAIT Means the meter is in the process of joining.
17			JOIN MODE: OTAA
17-1			JOIN MODE: Abp
18			View ADR setting
19			UP LOAD: ON Means AUTO function is open, otherwise it will show OFF

			Interval Time Option: 5/ 10/ 20/ 30/ 90/ 120/ 150/ 180/ 210/ 240 minutes
20			Meter ID/ Serial Number ********(8 digits)
21			**Password setting** Range: 0000~9999 Default: 1000
22			**IA current direction setting** Option: Frd, Rev Default: Frd *Frd = Forward; Rev = Reverse *And so on for IB & IC operation.

3.6 Setup Mode 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”:

3.6.1 Join Information:

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

Take OTAA setting as an example:

Settings interface	Set status	Optional configuration
		JOIN WAIT Means the meter is in the process of joining.
	 	**DevEui:** 1534567818283589 The 16 digits will be shown on 2 pages. Each page shows 8 digits.
	 	**setting page: AppEui and Appkey.** Use the same way to set AppEui and Appkey.
		**Adaptive Data Rate** Option: ON, OFF
		**SAVE page**

		Join mode Option: OTAA, ABP
		**Re-Join** This function allows the meter re-join the network when disconnected.
		**Upload** Option: ON, OFF Default: ON
		
		**Interval Time** Option: 30/ 60/ 90/ 120/ 150/ 180/ 210/ 240, Unit: min Default: 30min
		
		**Device Address**

		**Join Delay** Option:ON，OFF
		OFF LINE 60 Interval Time Option: 5/ 10/ 20/ 30/ 90/ 120/ 150/ 180/ 210/ 240 minutes 60 means the meter will send a command to gateway every 60 minutes.
		**Confirm mode** Option:OFF，ON

Chapter 4. LoRaWAN

4.1 LoRaWAN Classes

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

4.2 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 uploaded. Sometimes the interval time may have around 1-2 minutes difference due to the time error.

4.3 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 Activation) and ABP(Activation by Personalization).
To ensure the meter joins the 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.

4.4 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.

4.5 Communication

LoRaWAN meter communicates based on international general purpose protocol. The communication data is placed in data segment of LoRaWAN protocol, they will be appointed according to following specified command format.

The format of standard LoRaWAN is shown below:

Radio PHY layer:

Preamble	PHDR	PHDR_CRC	PHYPayload				CRC*
			MHDR	MACPayload		MIC	
			MHDR	FHDR	Fport	FRMPayload	MIC

Note:CRC* is only available on uplink messages

The following description of the text defines the data in the segment of FRMPayload region in LoRaWAN protocol. The software in the PC only needs 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.

Chapter 5. Declaration of Conformity (For MID meter only)

We, Zhejiang Eastron Electronic Co., Ltd. declares under our sole responsibility as the manufacturer that the three-phase multi-function electrical energy meter SDM630MCT-LR corresponds to the production model described in the EU-type examination certificate and complies with the requirements of the Directive 2014/32/EU.
Type examination certificate number 0598/MID/B/24/036(0120/SGS0703) .
Identification number of the Notified Body: 0598.

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

Zhejiang Eastron Electronic Co., Ltd.
No.52, DongJin Rd. Jiaxing, Zhejiang, 314001, China
Tel: 400-996-9296 Fax: +86-573-83698883
Email: sales@eastrongroup.com
www.eastrongroup.com

