

SDM530-LR

DIN Rail Smart Energy Meter for Long Range Wireless Communication



- Measures kWh Kvarh, KW, Kvar, KVA, P, F, PF, Hz, dmd, V, A, etc.
- Bi-directional measurement IMP & EXP
- Pulse output
- 2DI
- LoRaWAN
- Din rail mounting 35mm
- 100A direct connection
- Better than Class 0.5 / C accuracy

USER MANUAL

2023 V1.1

ENERGIBUTIKEN.SE

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-Smarta varor och tjänster på nätet

Part 1. Introduction

Introduction

The SDM530C is a three phase multi-function remote control energy meter. It measures all important electrical parameters, such as Active Energy (kWh), Current (A), Voltage (V), Frequency(Hz), Power Factor, Power Demand, import and export energy etc.

With a built-in relay, the meter can be remotely controlled to turn on or off the electricity supply via LoRaWAN. The user can also set alarm objects and alarm level, once the alarm is activated the relay will be turned off. The relay of each phase can be controlled together or separately.

Built-in interfaces provides pulse and LoRaWAN outputs.

Product features

- Max.100A Direct Connect
- Multifunction Measurement, Displays Scrollable Settings
- Support AMR, SCADA system
- Remote Control with Built-in Relay
- Energy Resettable
- White Backlit LCD Display
- Din Rail Mounting 35mm

Technical parameters

- ◆ Input Voltage: Basic Value: 230V AC
Operating Voltage Range: $\pm 20\%$ Basic Value
Measurement Form: Valid Values
- ◆ Input Current: Basic Value: 5A
Max.Current: 100A
Over Current Withstand: 30 I_{max} for 0.1s
- ◆ Input Frequency: Basic Value: 50/60Hz
Input Frequency Range: 45-65 Hz
- ◆ Insulation Capabilities: - AC voltage withstand 4KV/1min
Impulse Voltage Withstand 6kV – 1.2 μ S waveform
- ◆ Power Consumption: $\leq 2W$
- ◆ Pulse Output type: Configurable
- ◆ Pulse Output Rate: 1000imp/kWh(Default)
- ◆ Display: LCD with White Backlit
- ◆ Max reading: 999999.99 kWh

Energy Measurements

- Imported active energy 0 to 999999.99 kWh
- Exported active energy 0 to 999999.99 kWh
- Imported reactive energy 0 to 999999.99 kVarh
- Exported reactive energy 0 to 999999.99 kVarh
- Total active energy 0 to 999999.99 kWh
- Total reactive energy 0 to 999999.99 kVarh

Accuracy

- Voltage 0.5% of range maximum
- Current 0.5% of nominal
- Frequency 0.1% of mid-frequency
- Power factor 1% of unity (0.01)
- Active power (W) $\pm 1\%$ of range maximum
- Reactive power (VAr) $\pm 1\%$ of range maximum
- Apparent power (VA) $\pm 1\%$ of range maximum
- Active energy (Wh) Class 0.5 IEC 62053-22
Class C EN50470-1/3
- Reactive energy (VArh) Class 2 IEC 62053-23
- Response time to step input 1s, typical, to >99% of final reading, at 50 Hz.

Interfaces for External Monitoring

Three interfaces are provided:

- LoRaWAN communication channels via protocol wireless.
- Pulse output indicating real-time measured energy

Pulse Output

Pulse output is non-configurable. It is fixed up with active kWh. The constant is 1000imp/kWh.

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 $\pm 1^\circ\text{C}$
- Input frequency 50Hz(MID)
50 or 60Hz $\pm 2\%$ (non-MID)
- Input waveform Sinusoidal (distortion factor < 0.005)
- Magnetic field of external origin Terrestrial flux

Environment

- Operating temperature 3K6 (-25°C to +55°C*)
- Storage temperature -40°C to +70°C*

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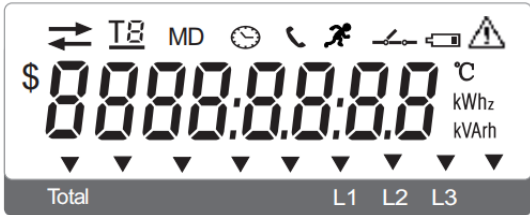
-Smarta varor och tjänster på nätet

- Relative humidity 0 to 90%, 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.

Start-up Screens

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

1		The first screen lights up all display segments and can be used as a display check.
2		The second screen indicates the firmware installed in the unit and its build number.
3		Firmware number
4		If the communication failed, the meter will show ERR 1024.

Measurements



- ◆ Measurement mode, short press: switch the screen;
- ◆ Setting mode: short press: switch menu or single-digit increases at the same level; Long press: return to the previous menu.



- ◆ Measurement mode, short press: invalid; Long press: enter the setting mode;
- ◆ Setting mode, short press: move the cursor (the cursor flashing number for setting the state); Long press: menu item selection confirmation and parameter modification confirmation.

Page	Display	Description
1		Total active energy Example energy: 120.00kWh Represents relay open Represents relay close
2		Import active energy Example: 60.00kWh
3		Export active energy Example: 60.00kWh
4		Total reactive energy Example: 200.00 kVarh
5		Import reactive energy Example: 100.00 kVarh
6		Export reactive energy Example: 100.00kVarh

7	 The LCD display shows '230.0' followed by a small 'V' on the right. Below the display is a dark bar with 'Total' on the left and 'L1 L2 L3' on the right. A small downward arrow points to 'L1'.	L1 Voltage Example: 230.0V
	 The LCD display shows '230.0' followed by a small 'V' on the right. Below the display is a dark bar with 'Total' on the left and 'L1 L2 L3' on the right. A small downward arrow points to 'L2'.	L2 Voltage Example: 230.0V
	 The LCD display shows '230.0' followed by a small 'V' on the right. Below the display is a dark bar with 'Total' on the left and 'L1 L2 L3' on the right. A small downward arrow points to 'L3'.	L3 Voltage Example: 230.0V
	 The LCD display shows '50.809' followed by a small 'A' on the right. Below the display is a dark bar with 'Total' on the left and 'L1 L2 L3' on the right. A small downward arrow points to 'L1'.	L1 Current Example: 50.809A
	 The LCD display shows '50.809' followed by a small 'A' on the right. Below the display is a dark bar with 'Total' on the left and 'L1 L2 L3' on the right. A small downward arrow points to 'L2'.	L2 Current Example: 50.809A
	 The LCD display shows '50.809' followed by a small 'A' on the right. Below the display is a dark bar with 'Total' on the left and 'L1 L2 L3' on the right. A small downward arrow points to 'L3'.	L3 Current Example: 50.809A
	 The LCD display shows '1.800' followed by a small 'kW' on the right. Below the display is a dark bar with 'Total' on the left and 'L1 L2 L3' on the right. A small downward arrow points to 'L1'.	L1 Active power Example: 1.800kW

		L2 Active power Example: 1.800kW
		L3 Active power Example: 1.800kW
		Total Active power Example: 5.400kW
		L1 Power factor Example: 1.000
		L2 Power factor Example: 1.000
		L3 Power factor Example: 1.000
		Total Power factor Example: 1.000

		Frequency Example: 50.00hz
		Maximum total active power demand Example: 2.680kW
		Pulse Constant Example: 1000imp/kWh The current output mode of the optocoupler pulse is total active energy mode.
		The failure interface Example: Err-01 Automatic display when the current fault occurs, and error-01 means that the relay cannot be disconnected.
		Over-limit alarm interface In the measurement interface, the upper right corner appears  and  indicates that the measured value of the alarm object exceeds the alarm value. The relay can be closed by using communication or manually only after troubleshooting.
		DI 1 - count

		DI 2 - count
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3.3 Setting Mode 1

Long press " " for three seconds to enter the setting mode (exit the setting interface if there is no operation in the next minute and return the remaining amount interface) :

Instructions: on the normal display interface, press the button 3s on the right to enter the setting interface (password input interface).

In the setting state, long press the left button 3s to exit the setting state.

In the setting state, long press the right button 3s to enter/confirm.

Press the button on the right side to set the moving position;

In the setting state, press the button on the left side to scroll or change the setting item;

Page	Display	Description
1		Password Enter password into the Settings screen; Default password: Ej publikt Press select number, press select shift. Then long press to enter the setup system.
2-1		Pulse Constant Default: 1000imp/kWh Optional: 1000, 100, 10, 1.
2-2		Long press  into the constant setting interface, the current character flashing. Then, press  to select the new constant. Finally, long press  to confirm

		Settings.
3-1		Pulse width Default: 100ms Optional: 200, 100, 60. If the pulse constant is equal to 1000imp/kWh, the setting interface cannot be set to 200ms at this time.
3-2		Long press  to enter pulse width setting interface, the current character flashing. Then, press  to select the new pulse width. Finally, long press  to confirm Settings.
4-1		Pulse output type Default: P (Total active energy) Optional
4-2		Long press  into the pulse output type setting interface, the current character flicker. current charact Then, press  to select the new pulse output type. Finally, long press  to confirm settings.  kWh Total active kWh  kWh Total reactive kWh
5-1		Demand cycle Default: 60 min Demand cycle range: 0-60min. 0 represents real-time update demand.

5-2		Long press  into the demand period setting interface, the current character flicker. Then, press  to select a new demand cycle. Finally, long press  to confirm settings.
6-1		Auto display scroll time Default: 0s (without round show) Rotation time range: 0~30s
6-2		Long press  to enter auto wheel display time setting interface, the current character flicker. Then, press  to select the new auto wheel display time. Finally, long press  to confirm settings.
7-1		Backlight lighting time Default: 60 min optional: off,on,5,10,20,30,60,120 Off means that the backlight is turn off; on means that the backlight is turn on.
7-2		Long press  into the backlit time setting interface, the current character will flicker. Then, press  to select the new backlight lighting time. Finally, long press  to confirm settings.

8		DI fliter time Setting range: 0~255ms Default 100ms
9		Long press  enter the maximum demand reset setting interface, the current character flicker. Finally, long press  to confirm zero clearing.

3.4 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).

3.4.1 Join Information - OTAA

1		DevEui: end-device identifier ***** (16 digits)
1-1		1-8 digits
1-2		9-16 digits

2		AppEui: application identifier ***** (16 digits)
2-1		1-8 digits
2-2		9-16 digits
3		AppKey: Application key (32 digits)
3-1		1-8 digits
3-2		9-16 digits
3-3		17-24 digits

3-4		25-32 digits
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3.4.2 Join Information - ABP

1		Dev address
1-1		Total 8 digits
2		NwkSKey: Network session key ***** (32 digits)
2-1		1-8 digits
2-2		9-16 digits

2-3	 The LCD display shows the number '3' at the top. Below it are eight '8' digits. At the bottom, there is a bar with the word 'Total' on the left and 'L1 L2 L3' on the right.	17-24 digits
2-4	 The LCD display shows the number '4' at the top. Below it are eight '8' digits. At the bottom, there is a bar with the word 'Total' on the left and 'L1 L2 L3' on the right.	25-32 digits
3	 The LCD display shows the text 'APPS' followed by a space and 'KEY'. At the bottom, there is a bar with the word 'Total' on the left and 'L1 L2 L3' on the right.	AppSKey: Application session key ***** (32 digits)
3-1	 The LCD display shows the number '1' at the top. Below it are eight '8' digits. At the bottom, there is a bar with the word 'Total' on the left and 'L1 L2 L3' on the right.	1-8 digits
3-2	 The LCD display shows the number '2' at the top. Below it are eight '8' digits. At the bottom, there is a bar with the word 'Total' on the left and 'L1 L2 L3' on the right.	9-16 digits
3-3	 The LCD display shows the number '3' at the top. Below it are eight '8' digits. At the bottom, there is a bar with the word 'Total' on the left and 'L1 L2 L3' on the right.	17-24 digits
3-4	 The LCD display shows the number '4' at the top. Below it are eight '8' digits. At the bottom, there is a bar with the word 'Total' on the left and 'L1 L2 L3' on the right.	25-32 digits

3.4 Join Status

1		JOIN OK Means the meter is connected to the gateway successfully
1-1		OTAA mode Optional: ABP mode
2		ADR mode: ON/OFF

3.5 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

1		From the Set-up menu, use and buttons to select the AUTO option. Press for 3s enter to the setting page.
1-1		UP LOAd: ON Range: ON/OFF Press for 3s, the current option will flash. Use or to choose the option.
2		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.

3.6 Password setting and alarm settings

1		User Password Default: not public optional: 0 ~ 9999
1-1		Long press  to enter the user password setting interface and the current character flashes. Then, click  the new User Password. Finally, long press  to confirm settings.
2		Check alarm information Enter this setting to check alarm associated information: Voltage\ Current\Active power\reactive Power\apparent power\Frequency
2-1		Alarm object Default: NULL(No alarm object) Note: this option can only be set via communication
2-2		Alarm Value Default: 100000.0 Note: this option can only be set via communication
2-3		Relay Control The display status of this option is off for relay open and on for relay close. This option can be set only if the alarm occurs when the relay automatically disconnects. Set relay close through this option, which means

		manually disarming the alarm. Therefore, before you do this, make sure the alarm object is troubleshooting. Long press enter relay status setting interface, current character 2-4 flicker. Then, press select the new relay status. Finally, long press to confirm settings..
2-4		Long press  to enter relay status setting interface, current character flicker. Then, press  to select the new relay status. Finally, long press  to confirm settings.

3.4 Setting mode 2

Input Password "5303", press both buttons together for 3s to enter the setting up page. The first page will show join status between the meter and gateway. Below information can be adjusted through password "5303":

3.4.1 Join information

3.4.2 Join Mode OTAA/ABP

3.4.3 Re-join

3.4.4 Auto: Upload ON/OFF, Upload Interval Time

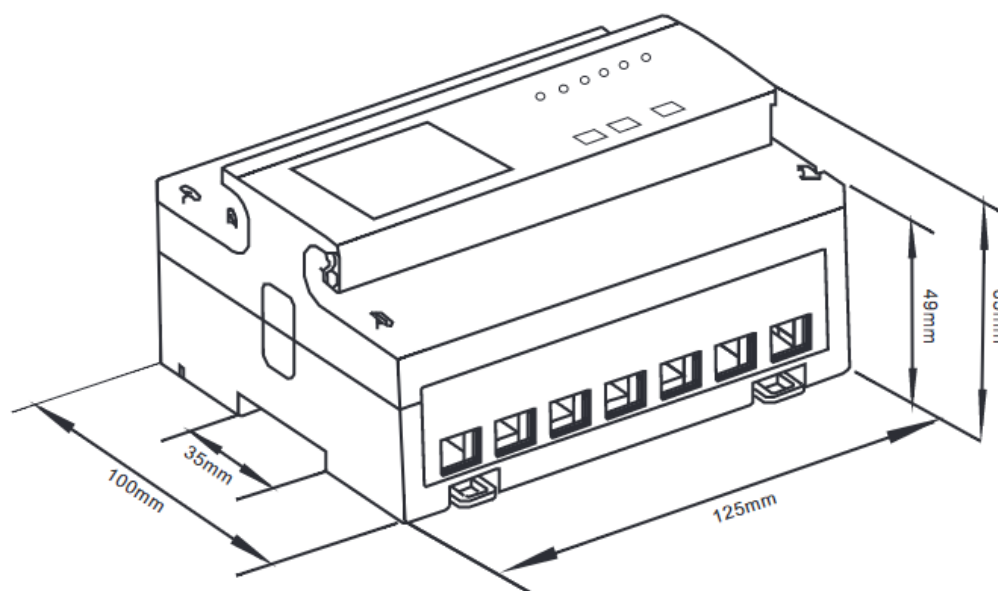
When Auto is ON, the meter will send a command to gateway automatically. This is for the gateway to check if the meter is still online. Under Active upload mode, the Auto function is not used.

3.4.5 Join Delay

3.4.6. Offline

4.3.7 Confirm Mode

Dimensions:

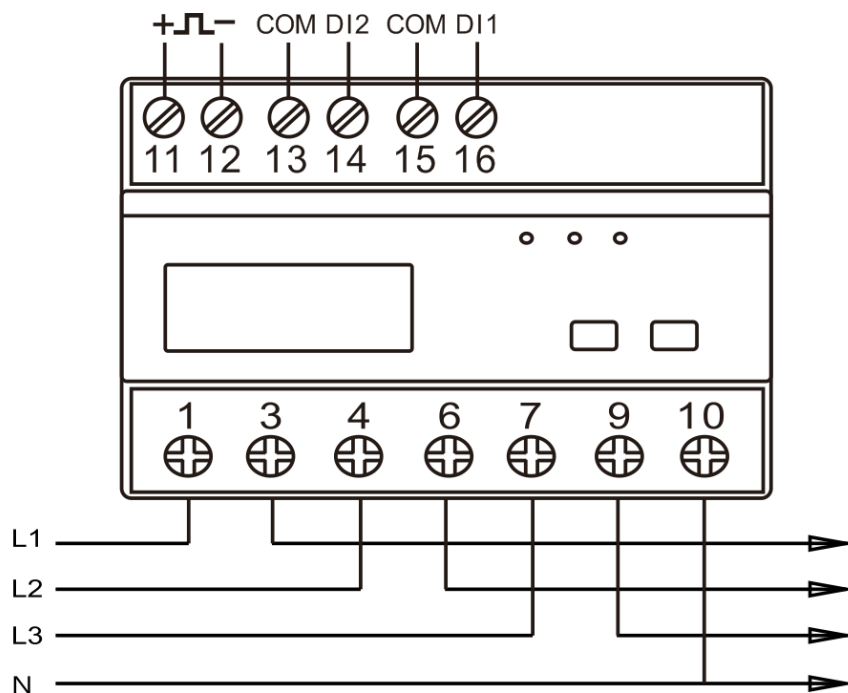


Wiring torque

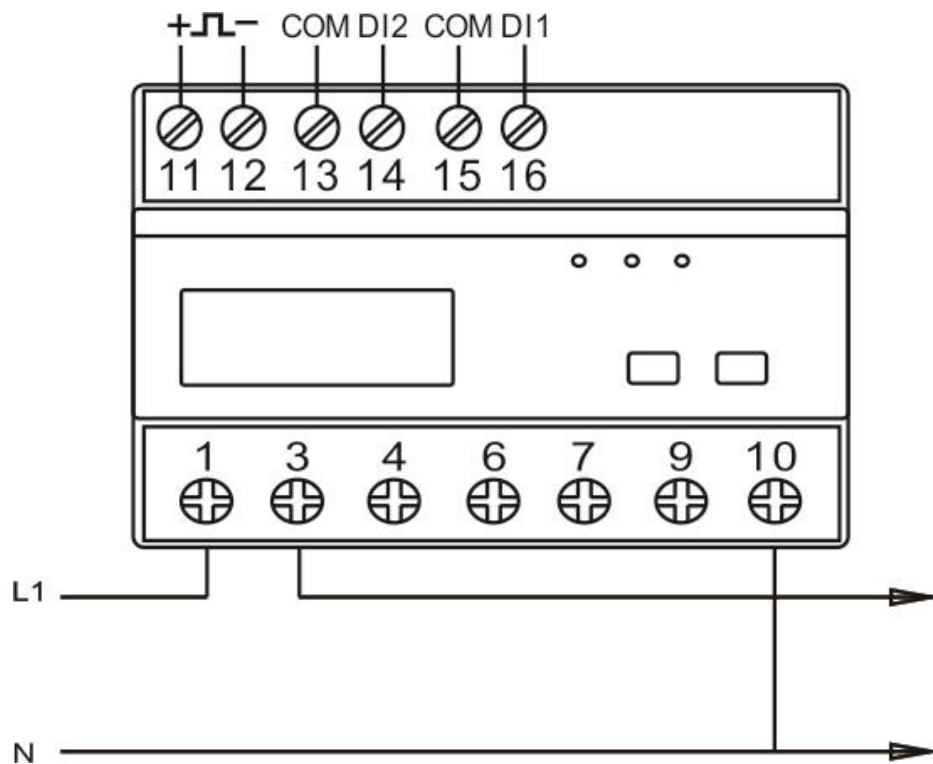
Terminals		
COMM/Pulse/2T	0.5~1.5mm ²	0.4Nm
Load	4~25mm ²	3Nm

Wiring diagram

- Three Phase Four Wires:



- Single Phase Two Wires:



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