

Datasheet

- Gateway-Free Point-to-Point Communication
- 100A Direct Connection
- 100ms Data Update Rate, High Real-Time Performance
- Bidirectional Energy Measurement
- -40°C ~ +70°C operating temperature
- Easy Installation and Simple Commissioning

The SDM230-Lora is a single-phase multi-function energy meter integrating LoRa Point-to-Point (P2P) wireless communication technology. Designed for distributed electrical equipment monitoring, the meter enables remote data acquisition without the need for dedicated gateway devices or network servers. The product consists of two main components:

SDM230-Lora Meter: Installed at the measurement point, it captures and displays voltage, current, power, energy, and other electrical parameters, while transmitting data wirelessly via the built-in LoRa module.

ES-LR1 Receiver Module: Installed at the data collection side, it receives the LoRa signal and provides RS485 output with Modbus-RTU protocol for seamless integration with data concentrators, PLCs, EMS, or SCADA systems.

By eliminating the wiring constraints of traditional RS485 solutions and the infrastructure overhead of wireless gateway-based approaches, the SDM230-Lora P2P offers a streamlined, reliable, and cost-effective alternative for remote monitoring of distributed measurement points.



Meter Specifications

Specification	
Nominal voltage(Un)	230V ac
Operational voltage	100-277V AC(L-N)
Insulation capabilities	
- AC voltage withstand	4KV for 1 minute
- Impulse voltage withstand	6KV-1.2 / 50μs waveform
Minimum current (Imin)	0.15A
Basic current (Ib)	10A
Maximum rated current (Imax)	100A
Operational current range	0.4% Ib-Imax
Over current withstand	30 Imax for 0.01s
Operational frequency range	50/60Hz
Internal power consumption	≤ 2W/10VA
Pulse output 1	Configurable
Pulse output 2	1000imp/kWh
Max reading	99999.99 kWh

Accuracy	
Voltage, Current	±0.5%
Frequency	±0.1%
Power factor	±0.01
Active power, Apparent power	±1%
Reactive power	±2%
Reactive energy(VArh)	Class 2 IEC 62053-23
Active energy(Wh)	Class 0.5 IEC62053-21 / Class C EN50470-3:2022

LoRa	
Protocol Standard	Four-Faith Private Protocol
Operating Mode	Transparent Mode
Operating Frequency Band	868MHz
Bandwidth	125KHz
Transmit Power	Max 22dBm
Air Data Rate	977bps(supports Spreading Factor SF10)

Performance criteria	
Operating humidity	≤ 90%, no condensing
Storage humidity	≤ 95%, no condensing
Operating temperature	-40°C ~ 70°C
Storage temperature	-40°C ~ 70°C
Reference temperature	23°C±2°C
International standard	IEC 62052-11:2021/A11:2022 / EN50470-3:2022
Accuracy class	Class 0.5 / Class C
Installation category	CAT III
Mechanical environment	M1
Electromagnetic environment	E2
Degree of pollution	2
Protection against penetration of dust and water	IP51 front display; IP20 whole meter
Insulation encased meter of protective class	II
Electrostatic discharges	8kV contact / 15kV air gap
Electromagnetic HF fields	IEC 6100-4-3
Electrical fast transients	4kV
Surge	4kV
Radiated & conducted emissions	EN55022
Radiated & conducted emissions	EN55022

Pulse output	
Pulse output	2
Pulse output type	Passive
Pulse output 1	Configurable
Pulse width	200 / 100(default) / 60ms
Pulse output 2	1000imp/kWh

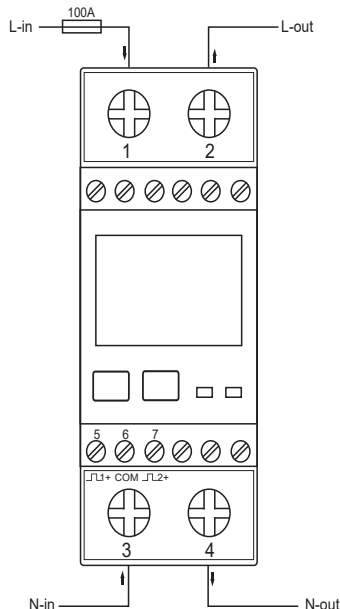
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ES-LR1 Specifications

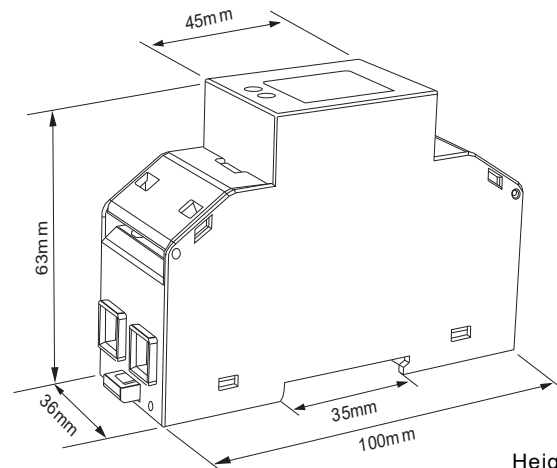
Technical Parameters	
Power Supply	9-15V DC
Mechanical Characteristics	
Net Weight	30g
IP Degree of Protection (IEC 60529)	IP20 (Indoor)
Dimensions (WxHxD)	43.8*58.8*16.5mm
Material of Meter Case	Self-extinguishing UL 94 V-0
Mechanical Environment	M1
Environmental Characteristics	
Operating Temperature	-25°C ~ +55°C
Storage Temperature	-25°C ~ +80°C
Operation humidity	≤85% RH Non-condensing
Storage humidity	40%~85% RH Non-condensing
RS485	
Interface 1 Protocol	Modbus-RTU
Communication Address	253
Transmission Mode	Half Duplex
Data Type	Floating Point
Transmission Distance	1000m Maximum
Transmission Speed	2400/4800/9600(Default)/19200bps
Parity	NONE(Default)/ODD/EVEN
Stop Bits	1/2
Response Time	<100 ms

LoRa	
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Operating Frequency Band	868MHz
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Transmit Power	Max 22dBm
Air Data Rate	977bps(supports Spreading Factor SF10)
Antenna Specification	
Frequency Range (MHz)	868
Impedance (Ω)	50
Peak Gain (dBi)	-6.72
VSWR	≤3.5
Max Power (W)	10
Antenna Type	Omnidirectional
Polarization	Vertical
Operating Current (mA)	<20
Withstand Voltage (V)	<20
Antenna Efficiency	>20%
Horizontal Coverage Angle	360°
Antenna Technical Parameters	
Operating Temperature	-40°C ~ +80°C
Storage Temperature	-40°C ~ +80°C
Material	TPE+CU
Antenna Dimensions	See drawing (Section 2.3.2 Receiver Module Dimensions)
Output Connector	MCX
Cable Length	55±2mm

Wiring Configuration



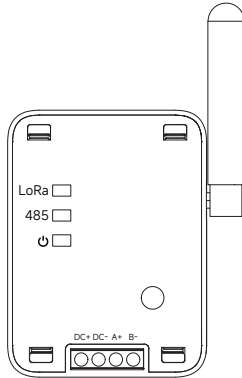
Dimension Drawing



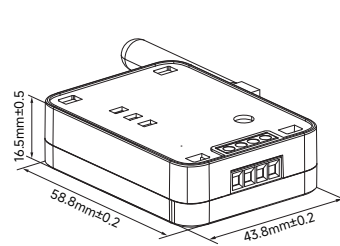
Height 100mm
Width 36mm
Depth 63mm

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Wiring Configuration

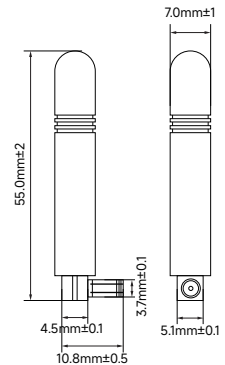


Dimension Drawing



Height: 58.8mm
Width: 43.8mm
Depth: 16.5mm

Module Dimensions



Antenna Dimensions

Application Scenarios (not limited to these)

Application Area	Specific Use Case
Solar + Storage + Charging	Inverters/PCS/charging stations located far from the distribution panel — energy data needs to be sent back to the local EMS or data concentrator
Rooftop Solar PV	PV grid-connection point on the rooftop (outdoor, control room indoors — wireless transmission avoids wall-penetrating cable routing)
Distributed Power Distribution	Multiple sub-distribution cabinets across different workshops in a factory — centralized meter reading is required but cabling is difficult
Commercial Building Sub-metering	Meters distributed across different floors or tenant spaces — unified wireless collection to the building management system
Temporary or Mobile Installations	Construction sites, event venues, or temporary power points — rapid deployment of power monitoring without cabling works
Retrofit / Upgrade Projects	Adding energy monitoring systems to existing buildings — no wall modifications, no exposed wiring, minimal disruption to operations

Ordering Information

Model	Included Components	Description
SDM230-Lora P2P	SDM230-Lora Meter ×1 + ES-LR1 Receiver Module ×1	Single-phase wireless energy monitoring kit

Conformity References

Measurement category: IEC 61010-1 CAT III

Current input: Direct connect

Over-voltage category: CAT III

Dielectric withstand: IEC 61010-1 double insulated, IEC 62052-31:2015

Protective class: II

EMC: EN 61326-1:2021 & EN 61326-2-3:2021, EN IEC 62052-11:2021/A11:2022

Low Voltage Directive: EN 61010-1:2010+A1:2019 & EN IEC 61010-2-030:2021+A11:2021, IEC 62052-31:2015

MID Std: EN 50470-3:2022 and IEC / EN IEC 62052-11:2021/A11:2022, IEC 62052-31:2015