SDM120C

Smart Mini Power

Product Description

One-phase energy analyzer with two pulse outputs, indicating for active and reactive energy metering , and one RS485 communication port for remote meter reading and management. Housing for DIN-rail mounting, IP51 protection degree. Direct connection up to 45A.Various important electrical parameters are measured and displayed.

Technical Data

- **Performance criteria:**

Operating humidity	≤ 85%
Storage humidity	≤ 95%
Operating temperature	-25°C - +55°C (3K6)
Storage temperature	-30°C - +70°C
International standard	IEC 62053-21
Accuracy class	0.5 or 1.0
Protection against penetration of dust and water	IP51
Insulating encased meter of protective class	II

- **Meter specifications:**

Nominal voltage(Un)	230V AC 110V AC
Operational voltage	0.7-1.3Un
Insulation capabilities:	
- AC voltage withstand	4KV for 1 minute
- Impulse voltage withstand	6kV-1.2μS waveform
Basic current (Ib)	5A
Maximum rated current (Imax)	45A
Operational current range	0.4% Ib-Imax
Over current withstand	20Imax for 0.01s
Operational frequency range	50-60Hz ±2%
Internal power consumption	≤ 2W / 10VA
Test output flash rate (RED LED)	1000imp/kWh
Pulse output rate	1000imp/kWh
Consumption indicator (RED LED)	Flashing at load running
Data communication port	RS485 Modbus RTU
Data save	>20 years when power off

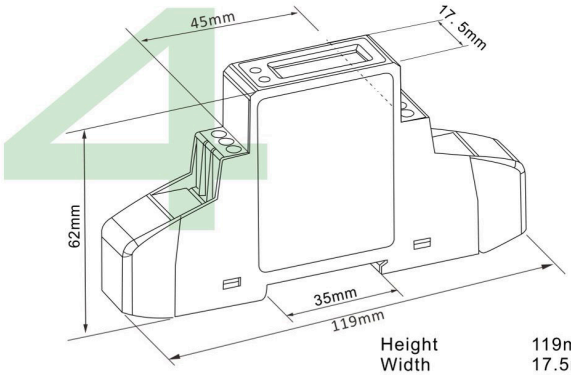
- **RS485 communication specifications:**

Bus type	RS485
protocol	MODBUS RTU with 16 bit CRC
baud rate	1200(default)2400, 4800,9600
Address range	1-247 user settable
Bus Loading	32 meters per bus
Rage	1000M
Parity	EVEN (default)/ODD/NONE
Stop bit	1
Data bits	8

Features

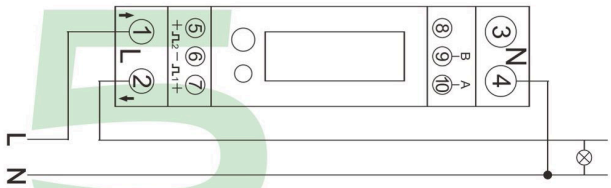
- Class 1 kWh according to EN62053-21
- Class B according to EN50470-3
- Class 1 kvarh according to EN62053-23
- Accuracy ±0.5 Current / Voltage /Power
- Max. energy reading:99999.9 kWh/kVarh
- Instantaneous variables:V,A,W,Wdmd,Wdmd max,var,PF,Hz etc.
- 1-DIN module
- Self power supply
- Protection degree IP51
- 2 pulse outputs
- 1 RS485 communication port
- Modbus RTU protocol

Dimensions



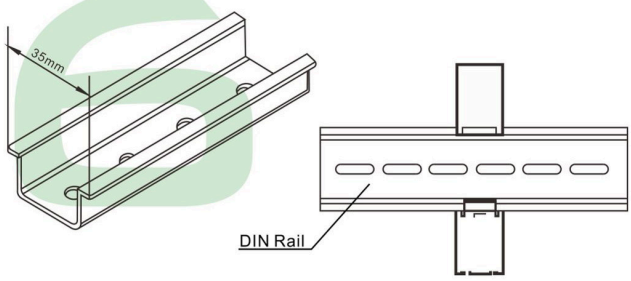
Height	119mm
Width	17.5mm
Depth	62mm
Weight	0.1Kg(net)

Wiring Diagram



Terminal 1: L-in
Terminal 2: L-out
Terminals 3 & 4: Neutral wire
Terminals 5 & 6 & 7: Pulse output
Terminals 9 & 10:RS485 port

Installation Diagram



SDM120C Smart Meter Modbus Protocol Implementation

The electrical interface is 2-wire RS485,via 2 screw terminal.Connection should be made using twisted pair screened cable (Typically 22 gauge Belden 8761 or equivalent).A total maximum length of 3900 feet(1200 meters) is allowed for the RS485 network.A maximum of 32 electrical nodes can be connected,including the controller.The address of SDM120C smart meter can be set to any value between 1 and 247.Broadcast mode(address 0)is not supported.

All data values in the SDM120C smart meter are transferred as 32 bit IEEE754 floating print numbers,therefore each SDM120C smart meter value is transferred using two Modbus Protocol registers.All register read requests and data write requests must specify and even number of registers.Attempts to read/write and odd number of registers prompt the SDM120C smart meter to return a Modbus Protocol exception message.

The Modbus Protocol establishes the format for the master's query by placing into it the device address,a function code defining the requested action,any data to be sent,and an error checking field.The slave's response message is also constructed using Modbus Protocol.

Modbus Protocol function code **04** is used to read data.
For example, to request 01 04 00 00 00 02 CRC to read the voltage
to request 01 04 00 12 00 02 CRC to read apparent power

Modbus Protocol function code **10** is used to write data.
For example, to request 01 10 F6 00 00 01 02 00 02 CRC to set meter address as 02
to request 01 10 F8 00 00 01 02 00 04 CRC to set baud rate as 9600

The detailed register map information of SDM120C are as follows:

Address (Register)		Format	SDM120C Input Register Parameter		Access
HiByte	LoByte		Description	Units	
00	00	Float	Voltage	Volts	R
00	06	Float	Current	Amps	R
00	0C	Float	Power	Watts	R
00	12	Float	Volt Amps	Volt Amps	R
00	1E	Float	Power factor	None	R
00	46	Float	Frequency of voltage	Hz	R
02	01	Float	Total Energy	kWh	R
F1	01	Float	Positive Energy	kWh	R
F2	01	Float	Reverse Energy	kWh	R
F6	00	Hex	Meter number	1~247	R/W
F8	00	Hex	Baud rate	0001:1200bps 0002:2400bps 0003:4800bps 0004:9600bps	R/W
F9	00	Hex	Time of display in turns	0-30s Defult:0 do not display in turns	R/W
F9	10	Hex	Pulse output	0000:0.001kWh/imp (default) 0001:0.01kWh/imp 0002:0.1kWh/imp	R/W
F9	20	Hex	Measure model	0001:Model 1 0002:Model 2 0003:Model 3	R/W

- **Notes:**

Model 1: Measure imported energy,Total energy=Imported energy.
Model 2(default): Measure imported energy and exported energy, Total energy=Imported energy+exported energy.
Model 3: Measure imported energy and exported energy, Total energy=Imported energy- exported energy.