SDM72D-M-1

Three Phase Four Wire Energy Meter

- Measures active kWh & W.
- Resettable partial energy
- Bi-directional measurement IMP & EXP
- Pulse Output
- RS485 Modbus
- Din rail mounting 35mm
- Direct connection, up to 100A
- Better than Class 1/ B accuracy

User Manual V1.4

2023

Introduction

The SDM72D-M-1 is digital 3 phase 4 wire energy meter with a white back-lighted LCD screen for perfect reading. The unit measures and displays active energy (kWh) and power (W), imported and exported. A resettable partial energy is provided, so the user can easily check the energy imported and energy exported during a certain period. SDM72D-M-1 supports max.100A direct connection, saves the cost and avoid the trouble to connect external CTs, giving the unit a cost-effective and easy operation. Built-in interfaces provides pulse and RS485 Modbus RTU outputs. Configuration is password protected.

PART 1 Specification

General Specifications

Voltage AC (Un)	3x230(400)V
Voltage Range	80~120% Un
Base Current (Ib)	10A
Max. Current (Imax)	100A
Mini Current (Imin)	0.5A
Starting current	0.4% of Ib
Power consumption	≤2W/10VA
Frequency	50/60Hz(non-MID)
	50Hz(MID)
AC voltage withstand	4KV for 1 minute
Impulse voltage withstand	6KV-1.2uS wavform
Overcurrent withstand	30 max for 0.01s
Pulse output rate	1000imp/kWh
Display	LCD with backlit
Max. Reading	999999.9kWh
Active energy	Class 1 IEC62053-21
	Class B EN50470-1/3
Reactive energy	Class 2 IEC62053-23

Unit Characteristics

The Unit can measure and display:

- Power
- Active energy (imported and exported)

Pulse output indicates real-time energy measurement. An RS485 output allows remote monitoring from another display or a computer.

RS485 Serial – Modbus RTU

This unit uses an RS485 serial port with Modbus RTU protocol to provide a means of remotely monitoring and controlling the Unit.

Set-up screens are provided for setting up the RS485 port.

Pulse output

The unit provides pulse output for active kWh. The Pulse output is passive type.

The pulse out is fixed up with total kWh. The constant is 1000imp/kWh.

RS485 Output for Modbus RTU

For Modbus RTU, the following RS485 communication parameters can be configured from the Set-up menu:

Baud rate 1200,2400, 4800, 9600(default),19200 bps

Parity none (default)/odd/even

Stop bits 1 or 2

Data bit 8

Max.Bus loading 64pcs

Communication distance 1000M

RS485 network address *nnn* – 3-digit number, 001 to 247

Modbus™ Word order Hi/Lo byte order is set automatically to normal or reverse. It cannot be configured from the set-up menu.

Environment

Operating temperature	-25℃ to +55℃(default), -40℃ to +70℃(operational)
Storage and transportation temperature	-40℃ to +70℃
Reference temperature	23℃±2℃
Operating humidity	0 to 90%, non-condensing
Storage humidity	0 to 95%, non-condensing
Altitude	up to 2000m
Warm up time	3s
Installation category	CAT III
Mechanical Environment	M1
Electromagnetic environment	E2
Degree of pollution	2
Electrostatic discharges	8kV contact/ 15kV air gap
Electromagnetic HF fields	IEC 61000-4-3
Electrical fast transients	4kV
Surge	4kV
Radiated & conducted emissions	EN 55022

Mechanics

Din rail dimensions	72x100x66 (WxHxD) DIN 43880
Mounting	DIN rail 35mm
Sealing	IP51 (indoor)
Material	self-extinguishing UL94V-0
Insulating encased meter of protective class	II

PART 2 Operation

Initialization Display

When it is powered on, the meter will initialize and do self-checking.

	Full Screen
	Software Version
	Pulse constant
	Total active energy(kWh) Total=Import+ Export Max read: 999999.9 kWh

Buttons function

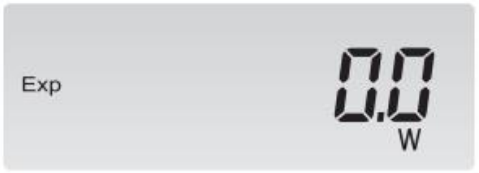
There are two buttons on the front panel.

	>Scroll the display for data checking. >Changing option at Set-up mode >Exit the Set-up mode
	>Set-up mode entry >Confirmation

Scroll display

After initialization and self-checking program, the meter display the measured values. The default page is total kWh. If the user wants to check other information, please press the scroll button  on the front panel.

	Total active energy Total=Import+ Export
	Import energy
	Export energy
	Total partial energy Total=Import+ Export
	Import partial energy
	Export partial energy

	L1 power
	L2 power
	L3 power
	Total active power
	Import active power
	Export active power
	Modbus Address
	Baud Rate

	Parity
	Pulse constant
	Software Version

Set-up Mode

To get into Set-up Mode, the user need to press the "Enter" button  for 3 seconds.

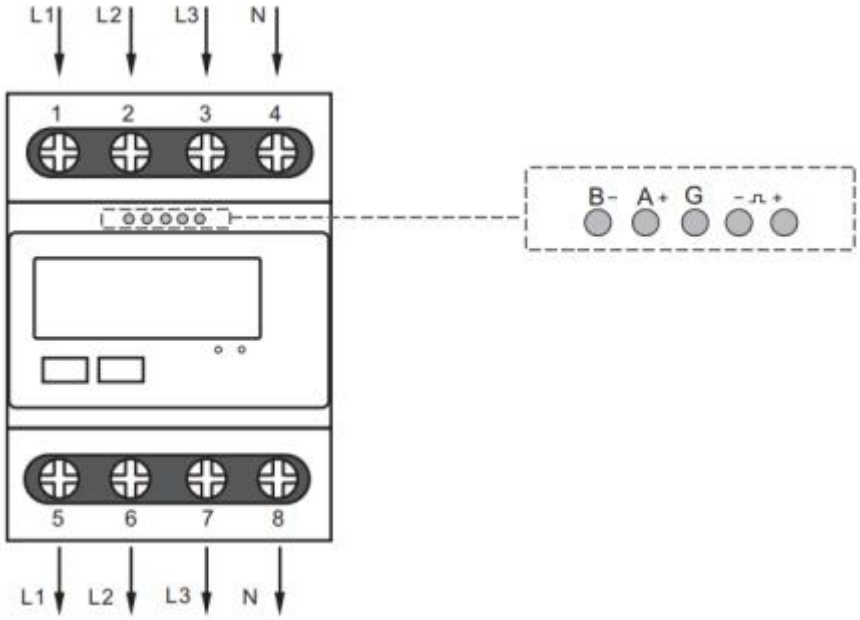
Page	Display	Descriptions
1		**Password** To get into Set-up mode, it asks a password confirmation. Default password: 1000 Use  and  to enter correct password.
		The entering information is wrong. The operation fails.
2		Keep pressing  for 3 seconds, the current selection will flash, use  and  to change the Modbus address. Options: 1~247 Keep pressing  for 3s to confirm the selection.
3		Keep pressing  for 3 seconds, the current

		selection will flash, use and to change the Baud rate. Options: 1.2k, 2.4k,4.8k,9.6k (default),1.92k Keep pressing for 3s to confirm the selection.
4		Keep pressing for 3 second, the current selection will flash, use and to change the Parity. Options: EVEN,ODD,NONE (default) Keep pressing for 3s to confirm the selection.
5		Use to select the Password option. Keep pressing for 3 seconds, the current selection will flash, use and to enter the new password. The range is from 0001 to 9999. Keep pressing for 3s to confirm the selection.
6		

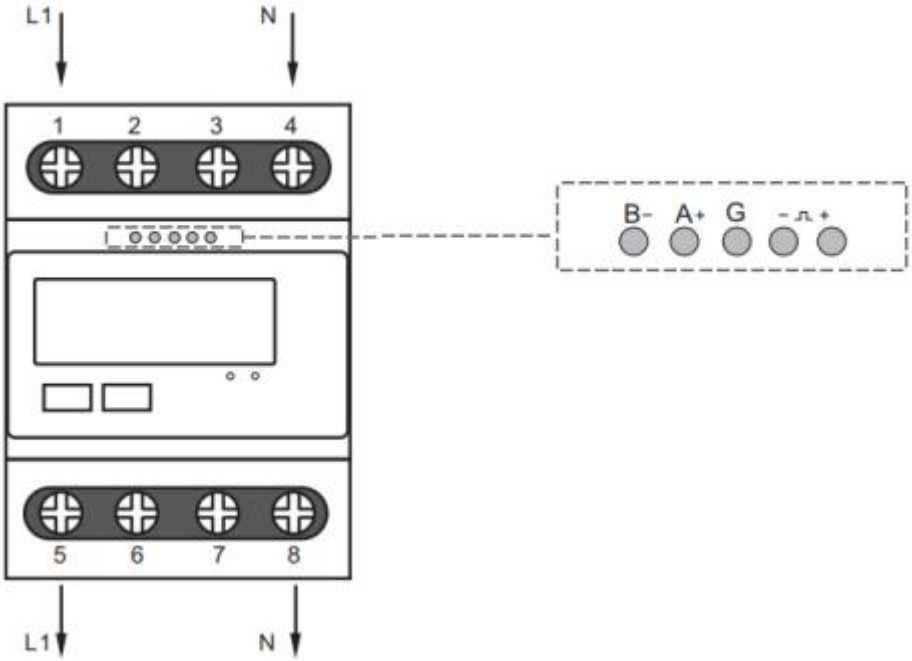
Keep pressing button to exit the set-up mold.

Wiring diagram

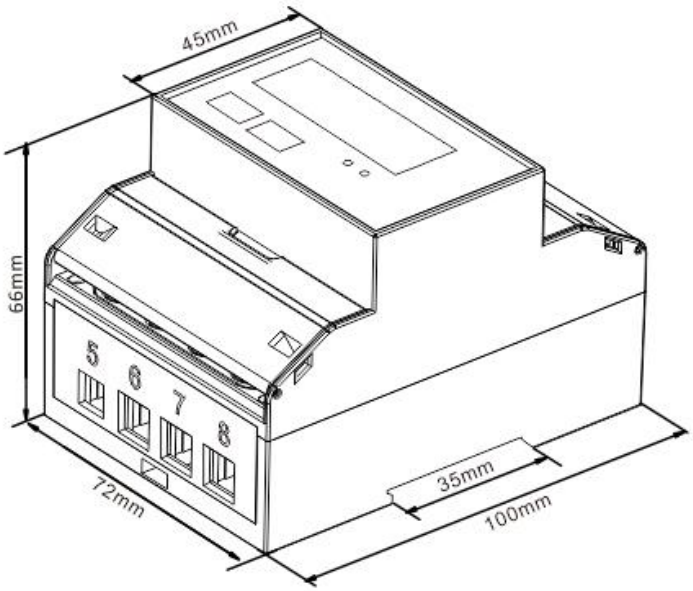
3 phase 4 wire



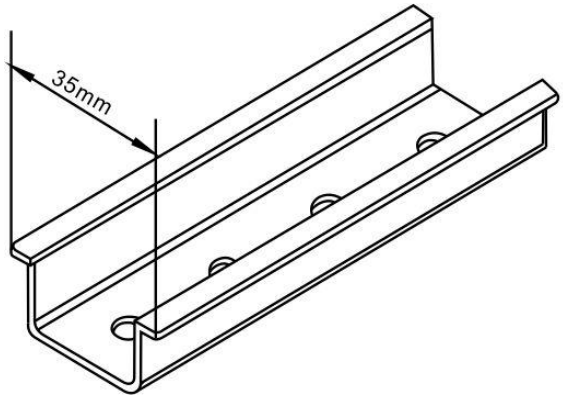
1 phase 2 wire

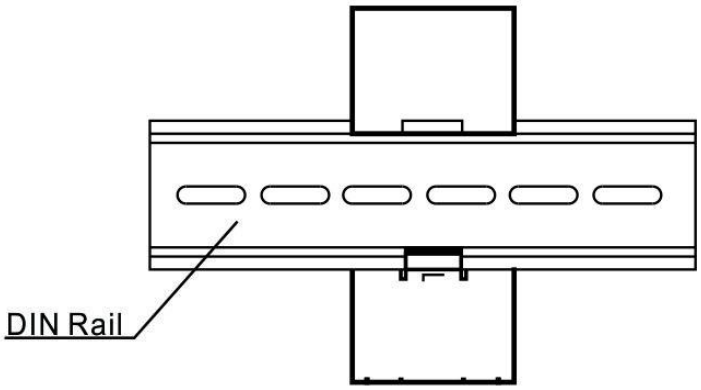


Dimensions



Installation





PART 3 Modbus Protocol

Input Registers

Input registers are used to indicate the present values of the measured and calculated electrical quantities. Each parameter is held in two consecutive 16 big register. The following table details the 3X register address, and the values of the the address bytes within the message. A (*) in the column indicated the parameter is valid for the particular wiring system, Any parameter with a cross (X) will return the value zero. Each parameter is held in the 3X registers. Modbus Protocol function code 04 is used to access all parameters.

For example, to request: Amps 1 Start address = 0006
No.of registers = 0002
Amps 2 Start address = 0008
No. Of register = 0002

Each request for data must be restricted to 30 parameters or less. Exceeding the 30 parameter limit will cause a Modbus Protocol exception code to be returned.

Address (Register)	Input Register Parameter				Modbus Protocol Start Address Hex	
	Description	Length (bytes)	Data Format	Units	Hi Byte	Lo Byte
30053	Total system power.	4	Float	W	00	34
30073	Total Import kWh	4	Float	kWh	00	48
30075	Total Export kWh.	4	Float	kWh	00	4A
30343	Total kWh (1)	4	Float	kWh	01	56
30385	resettable total active energy (1)	4	Float	kWh	01	80
30389	resettable import active energy	4	Float	kWh	01	84
30391	resettable export active energy	4	Float	kWh	01	86
31281	Total import active power	4	Float	W	05	00
31283	Total export active power	4	Float	W	05	02
30013	Phase 1 active power.	4	Float	W	00	0C
30015	Phase 2 active power.	4	Float	W	00	0E
30017	Phase 3 active power.	4	Float	W	00	10

Notes:

1. Total kWh equals to Import + export.

Holding Registers

Holding register are used to store and display instrument configuration settings. All holding registers not listed in the table below should be considered as reserved for manufacturer use and no attempt should be made to modify their values.

The holding register parameters may be viewed or changed using the Modbus Protocol. Each parameter is held in two consecutive 4X registers. Modbus Protocol Function Code 03 is used to read the parameter and Function code 10 is used to write. Write only to one parameter per massage.

Address Register	Parameter Number	Parameter	Modbus Protocol Start Address Hex		Valid range	Mode
			High Byte	Low Byte		
40019	10	Parity / Stop	00	12	Write the network port parity/stop bits for MODBUS Protocol, where:	r/w

					0 = One stop bit and no parity, default. 1 = One stop bit and even parity. 2 = One stop bit and odd parity. 3 = Two stop bits and no parity. **Length : 4 byte** **Data Format : Float**	
40021	11	Modbus Address	00	14	Write the network port node address: 1 to 247 for MODBUS Protocol, default 1. **Length : 4 byte** **Data Format : Float**	r/w
40025	13	Password	00	18	Read：get password Write：change password **Length : 4 byte** **Data Format : Float**	r/w
40029	15	Network Baud Rate	00	1C	Write the network port baud rate for MODBUS Protocol, where: 0 = 2400 baud. 1 = 4800 baud. 2 = 9600 baud (default). 5 = 1200 band **Length : 4 byte** **Data Format : Float**	r/w
40059	30	Time for scrolling display	00	3A	Default: 05, Unit: s **Range: 0~30, (** 0 means close scrolling) **Length : 4 byte** **Data Format : Float**	r/w
40061	31	Time of back light	00	3C	Default: 60. Unit: min Rang :0~120. (0 means the back light will work all the time) **Length : 4byte** **Data Format : Float**	r/w
461457		Reset	F0	10	00 03：reset the resettable energy **Length : 2 byte** **Data Format:Hex**	wo
464513		Serial number	FC	00	Serial number **Length : 4 byte** **Data Format : unsigned int32** **Note: Only read**	ro
464515		Meter code	FC	02	Meter code SDM72D-M-1= 00 84 **Length : 2 byte** **Data Format : Hex** **Note: Only read**	ro

464645		Software version	FC	84	The software showed on display XX.YY Format: XX= first byte; YY= second byte **Length: 2 byte** **Data Format: Hex** **Note: Read only**	ro

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

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