



## SDM72CT-M

### Three Phase Four Wire Energy Meter



- Measures kWh, W etc.
- Bi-directional measurement IMP & EXP
- Two pulse outputs
- RS485 Modbus
- Din rail mounting 35mm
- 1/5A CT connection
- Better than Class 1/ B accuracy

**User Manual V1.4**

**2017**

## Introduction

The SDM72CT-M is digital three phase 4 wire energy meter with a white back-lighted LCD screen for perfect reading. The unit measures and displays the characteristics of three phase four wires(3p4w) supply, including power, active energy, imported or exported. Energy is measured in terms of kWh. 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. 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)	5A CT input
Max. Current (Imax)	120% of Ib AC
Mini Current (Imin)	5% of Ib AC
Starting current	0.4% of Ib
Power consumption	<2W/10VA
Frequency	50/60Hz
AC voltage withstand	4KV for 1 minute
Impulse voltage withstand	6KV-1.2uS waveform
Overcurrent withstand	20max 0I for 0.5s
Pulse output rate	Configurable ( Pulse 1) 1000imp/kWh (Pulse 2)
Display	LCD with backlit
Max. Reading	999999kWh
Active energy	Class 1 IEC62053-21 Class B EN50470-3

## Unit Characteristics

The Unit can measure and display:

- Power
- Active energy imported and exported

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

### Current Transformer Primary Current

The unit can be configured to operate with CT ratio between primary current and secondary current. The secondary CT has two options: 1A/5A

### 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 two pulse outputs. Both pulse outputs are passive type.

Pulse output 1 is configurable. The pulse output can be set with Modbus protocol:

0.01 kWh / imp

0.1 kWh / imp

1 kWh /imp

10 kWh / imp

100 kWh /imp

Pulse width: 200/100(default)/60ms can set with Modbus protocol.

Pulse output 2 is non-configurable. It 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

**Parity** none (default)/odd/even

**Stop bits** 1 or 2

**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°C to +55°C
Storage and transportation temperature	-40°C to +70°C
Reference temperature	23°C ± 2°C
Relative humidity	0 to 95%, non-condensing
Altitude	up to 3000m
Warm up time	10s
Installation category	CAT III
Mechanical Environment	M1
Electromagnetic environment	E2
Degree of pollution	2

**Mechanics**

Din rail dimensions	72x100x66 (WxHxD) DIN 43880
Mounting	DIN rail 35mm
Sealing	IP51 (indoor)
Material	self-extinguishing UL94V-0

## PART 2 Operation

**Initialization Display**

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


	Full Screen
	Software Version
	Total active energy(kWh) Total=Import+ Export Max read: 9999999 kWh




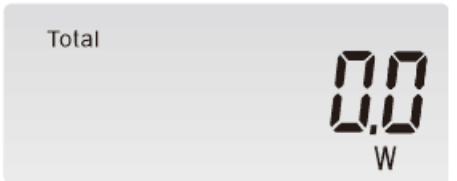
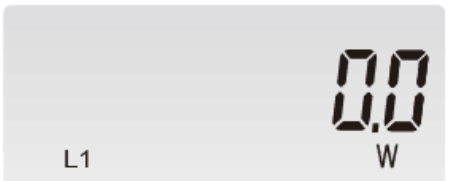
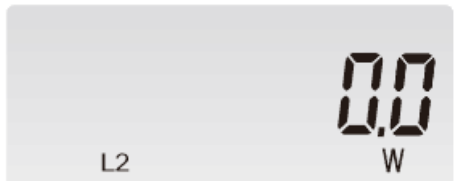

**Buttons function**

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(kWh) Total=Import+ Export
	import energy
	export energy
	Total active power (W)
	Active power L1
	Active power L2
	Active power L3

	CT ratio
	Pulse 1
	Modbus Address
	Baud Rate
	Parity

Set-up Mode

To get into Set-up Mode, the user need press the “Enter” button  for 3 second.

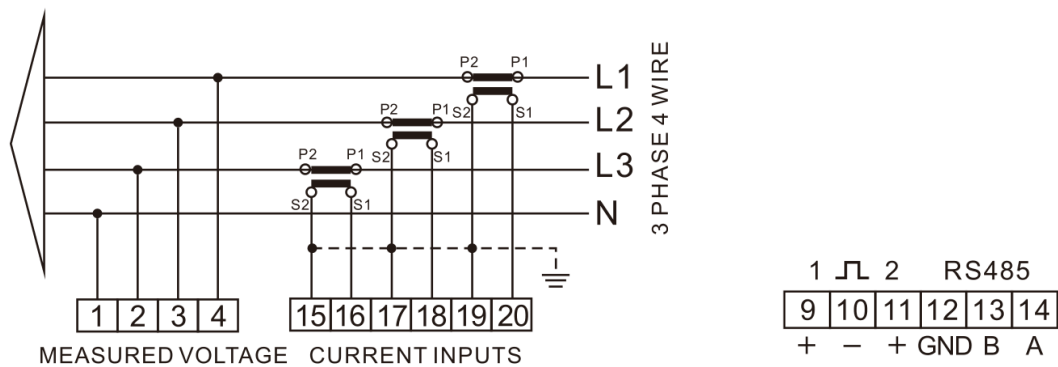
Page	Display	Descriptions
1		<p><b>Password</b></p> <p>To get into Set-up mode, it asks a password confirmation. Default password: 1000</p> <p>Use  and  to enter correct password.</p>
		The entering information is wrong. The operation fails.
2		<p>Keep pressing  for 3 second, the current selection will flash, use  and  to change the Modbus address. Options: 1~247</p> <p>Keep press  for 3s to confirm the selection.</p>
3		<p>Keep pressing  for 3 second, the current selection will flash, use  and  to change the Baud rate. Options: 1.2k, 2.4k,4.8k,9.6k ( default )</p> <p>Keep press  for 3s to confirm the selection.</p>
4		<p>Keep pressing  for 3 second, the current selection will flash, use  and  to change the Parity. Options: EVEN,ODD,NONE ( default )</p> <p>Keep press  for 3s to confirm the selection.</p>
5		<p>Use  to select the CT ratio option. Keep pressing  for 3 second, the current selection will flash, use  and  to enter the CT Ratio. The range is from</p>

5-1		<p>0001 to 2000. For example, if using a 100A/5A current transformer, you shall enter 0020.</p> <p>Keep press  for 3s to confirm the selection.</p>
6		<p>Use  to select the Password option. Keep pressing  for 3 second, the current selection will flash, use  and  to enter the new password. The range is from 0001 to 9999.</p>
6-1		<p>Keep press  for 3s to confirm the selection.</p>

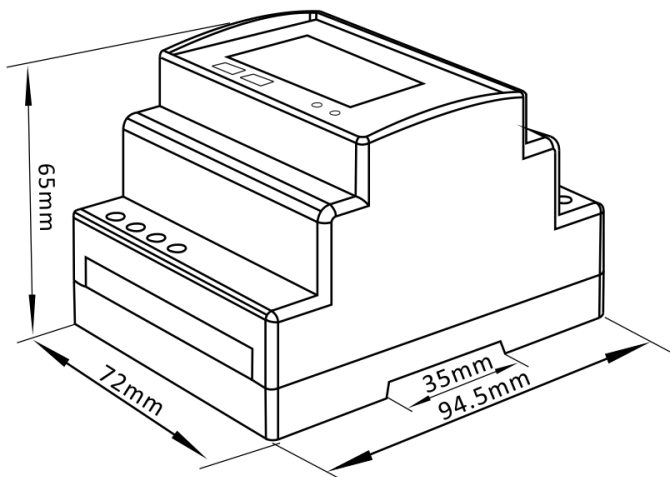
Keep pressing button  to exit the set-up mold.



**Wiring diagram**



**Dimensions**





**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 message.

Address Register	Parameter Number	Parameter	Modbus Protocol Start Address Hex		Valid range	Mode
			High Byte	Low Byte		
40013	7	Pulse 1 Width	00	0C	Write pulse on period in milliseconds: 60, 100 or 200, default 200. <b>Length : 4 byte</b> <b>Data Format : Float</b>	r/w
40015	8	Access authority (write password to get the access and read the status of the access) (KPPA)	00	0E	Read: to get status of the current access. 0: failed to get the access 1 : already got the access Write: write correct password to get the access <b>Length : 4 byte</b> <b>Data Format : Float</b>	r/w
40019	10	Parity / Stop	00	12	Write the network port parity/stop bits for MODBUS Protocol, where: 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. <b>Length : 4 byte</b> <b>Data Format : Float</b>	r/w
40021	11	Modbus Address	00	14	Write the network port node address: 1 to 247 for MODBUS Protocol, default 1. <b>Length : 4 byte</b> <b>Data Format : Float</b>	r/w
40023	12	Pulse 1 Rate	00	16	Write pulse rate index: n = 1 to 5 1--0.01kwh/imp 2--0.1kwh/imp 3--1kwh/imp 4-10kwh/imp	r/w

					5-100kwh/imp <b>Length : 4 byte</b> <b>Data Format : Float</b>	
40025	13	Password	00	18	Read: get password Write: change password <b>Length : 4 byte</b> <b>Data Format : Float</b>	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 <b>Length : 4 byte</b> <b>Data Format : Float</b>	r/w
40033	17	CT ratio	00	20	CT ratio ( Range: 0001—2000) <b>Default: 1</b> <b>Length : 4 byte</b> <b>Data Format : Float</b> (KPPA is asked)	r/w
40059	30	Time for scrolling display	00	3A	Default: 0, Unit: s <b>Range: 0~30, ( 0 means close scrolling)</b> <b>Length : 4 byte</b> <b>Data Format : Float</b>	r/w
40061	31	Time of back light	00	3C	Default: 0. Unit: min Rang :0~120. ( 0 means the back light will work all the time ) <b>Length : 4byte</b> <b>Data Format : Float</b>	r/w
40087	44	Pulse 1 Energy Type	00	56	Write MODBUS Protocol input parameter for pulse output 1: 1: import active energy 2: total active energy 4: export active energy, default 5: import reactive energy 6: total reactive energy 8: export reactive energy <b>Length : 4 byte</b> <b>Data Format : Float</b>	r/w

Accessory CTs



Split Core CTs ESCT-T Series

Model	Primary (A)	Second Output (A)	Accuracy
ESCT-T24	100	5A or 1A	0.5 or 1
ESCT-T24	150	5A or 1A	0.5 or 1
ESCT-T24	200	5A or 1A	0.5 or 1
ESCT-T24	250	5A or 1A	0.5 or 1
ESCT-T24	300	5A or 1A	0.5 or 1
ESCT-T24	400	5A or 1A	0.5 or 1
ESCT-T36	100	5A or 1A	0.5 or 1
ESCT-T36	150	5A or 1A	0.5 or 1
ESCT-T36	200	5A or 1A	0.5 or 1
ESCT-T36	300	5A or 1A	0.5 or 1
ESCT-T36	400	5A or 1A	0.5 or 1
ESCT-T36	500	5A or 1A	0.5 or 1
ESCT-T36	600	5A or 1A	0.5 or 1