

SDM220-MT

Single-Phase Multi-tariff Energy Meter



- Measures 4 Tariff' kWh/time.
And kVArh, kW, kVA, PF, Hz, dmd, V, A, etc.
- Bi-directional measurement IMP & EXP
- Two pulse outputs
- RS485 Modbus
- Din rail mounting 35mm
- 100A direct connection
- Better than Class 1 / B accuracy

User Manual V1.9

Application

The energy-meters are used to measure single-phase applications like residential, utility and Industrial. The unit measures and displays various important electrical parameters. It equipped with a white back-lighted LCD screen for prefect reading. As well as a RS485 communication port for remote reading and monitoring. Bi-directional energy measurement makes it a good choice for solar PV energy metering. The compact design and din rail installation provides an easy and economical solution for your metering demand.

PART 1 Specification

General Specifications

Voltage AC (Un)	230V
Voltage Range	176~276V AC
Base Current (Ib)	5A
Max. Current (Imax)	100A
Mini Current (Imin)	0.25A
Starting current	0.4% of Ib
Power consumption	<2W/10VA
Frequency	50/60Hz(±10%)
AC voltage withstand	4KV for 1 minute
Impulse voltage withstand	6KV-1.2uS waveform
Overcurrent withstand	30Imax for 0.01s
Pulse output rate	
-Pulse Output 1	1000/100/10/1 imp/Exp/kWh/kVArh (configurable)
-Pulse Output 2	1000imp/kWh (default) for import kWh
Display	LCD with white backlit
Max. Reading	99999.99kWh

Tariff Specifications

Tariff number	4
Time segments	10
Clock accuracy	≤0.5S (every 24 hours)
Battery voltage	3.6V DC, ≥1.2Ah

Accuracy

Voltage	0.5% of range maximum
Current	0.5% of nominal
Frequency	0.2% of mid-frequency
Power factor	1% of Unity
Active power	1% of range maximum

Reactive power	1% of range maximum
Apparent power	1% of range maximum
Active energy	Class 1 IEC62053-21 Class B EN50470-1/3
Reactive energy	Class 2 IEC62053-23

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 2000m
Warm up time	5s
Installation category	CAT II
Mechanical Environment	M1
Electromagnetic environment	E2
Degree of pollution	2

Output

Pulse Output

The meter provides two pulse outputs. Both pulse outputs are passive type.

Pulse output 1 is configurable. The pulse output can be set to generate pulses to represent total / import/export kWh or kVAh.

The pulse constant can be set to generate 1 pulse per: 0.001(default) /0.01/0.1/kWh/kVAh.

Pulse width: 200/100/60ms

Pulse output 2 is non-configurable. It is fixed to import kWh. The constant is 1000imp/kWh.

RS485 output for Modbus RTU

The meter provides a RS485 port for remote communication. Modbus RTU is the protocol applied. For Modbus RTU, the following RS485 communication parameters can be configured from the set-up menu.

Baud rate: 1200, 2400, 4800, 9600bps. Default: 2400 bps.

Parity: NONE/EVEN/ODD

Stop bits: 1 or 2

Modbus Address: 1 to 247

Mechanics

Din rail dimensions	36x90x62 (WxHxD) DIN 43880
Mounting	DIN rail 35mm
Ingress Protection	IP51 (indoor)
Material	self-extinguishing UL94V-0

LCD Display

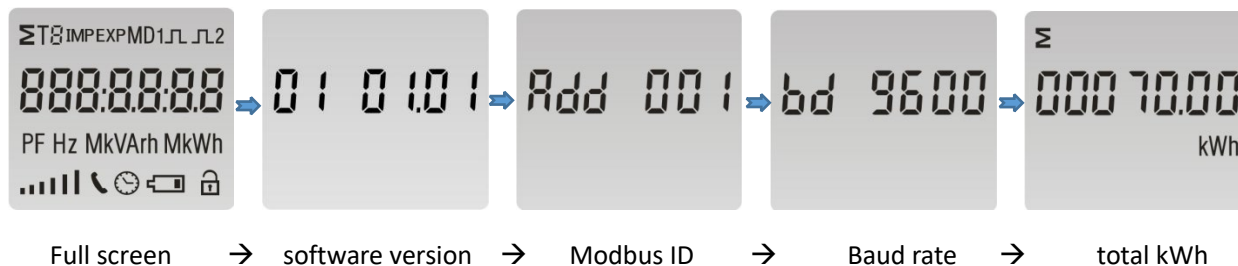
Item	Descriptions
1	7 digits used to display measured values or RTC
2	Total value
3	Tariff information
4	Import information, Export information
5	Max. demand for power or current
6	Pulse output 1 and Pulse output 2
7	Measurement units
8	PF = power factor Hz = frequency
9	Bar display of Power
10	Communication indicator
11	Time information
12	Low battery warning
13	Lock symbol



PART 2 Operation


Initialization Display

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














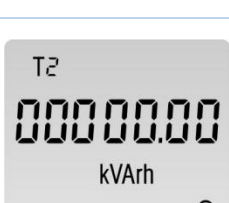
Scroll display by Button






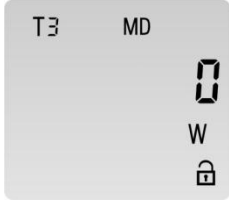

After initialization and self-checking program, the meter display the measured values. The default page is total kWh. If the user wants to check other information, he needs to press the scroll button on the front panel.



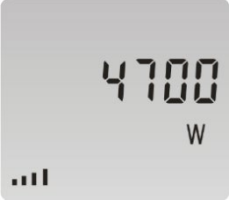
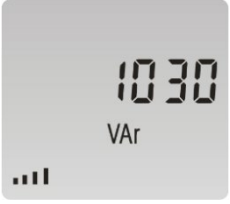
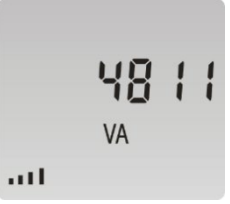
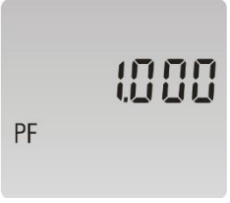
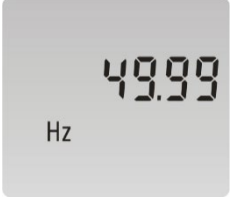
The display order by scroll button :



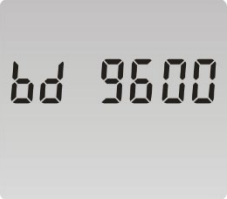

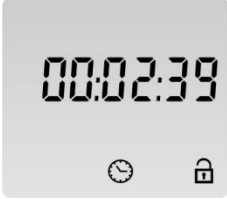


Total kWh→ import kWh→export kWh→ T1 kWh→T2 kWh→T3 kWh→T4 kWh→total kVArh→
 import kVArh→ export kVArh→T1 kVArh→T2 kVArh→ T3 kVArh→T4 kVArh→ Max. power demand→
 T1 Max. power demand→ T2 Max. power demand→ T3 Max. power demand→
 T4 Max. power demand→Voltage→Current→W→ VAr→ VA→ Power factor → Frequency →
 Pulse constant→ Modbus ID → Baud rate→Date→Time→Time segment 1→Time segment 2→
 Time segment 3→Time segment 4→Time segment 5→Time segment 6→Time segment 7→
 Time segment 8→Time segment 9→Time segment 10

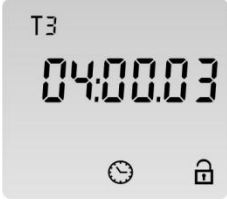

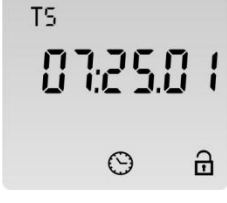
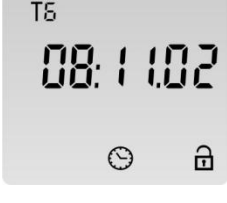
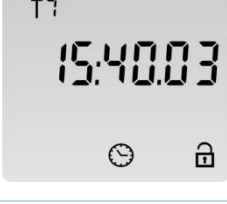
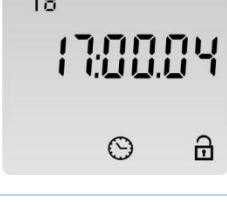
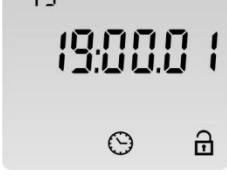
Page	Display	Descriptions
1		Total active energy Example:70.00kWh
2		Import active energy Example: 50.00kWh
3		Export active energy Example: 20.00kWh
4		T1 active energy Example: 0.00kwh
5		T2 active energy Example: 0.00kwh


6		T3 active energy Example: 0.00kwh
7		T4 active energy Example: 0.00kwh
8		Total reactive energy Example: 10.00kVArh
9		Import reactive energy Example: 5.00kVArh
10		Export reactive energy Example: 5.00kVArh
11		T1 reactive energy Example: 0.00kVArh
12		T2 reactive energy Example: 0.00kVArh

13		T3 reactive energy Example: 0.00kVArh
14		T4 reactive energy Example: 0.00kVArh
15		Max. power demand Example: 6930W
16		T1 Max. power demand Example:0 W
17		T2 Max. power demand Example:0 W
18		T3 Max. power demand Example:0 W
19		T4 Max. power demand Example:0 W

20		Voltage Example: 229.8V
21		Current Example: 30.156A
22		Active power Example: 4700W
23		Reactive power Example: 1030VAr
24		Apparent power Example: 4811VA
25		Power factor Example: 1.000
26		Frequency Example: 49.99Hz






27		Pulse constant Example: 1000
28		Modbus address Example: 001
29		Baud rate Example: 9600
30		Date Format: Day, Month, Year Example: 1st, Jan, 2014
31		Time Format: Hour, Minute, Second Example: 00:02:39
32		Time segment 1 Format: Hour, Minute, Tariff Example: 00:00, Tariff 1
33		Time segment 2 Format: Hour, Minute, Tariff Example: 02:00 Tariff 2


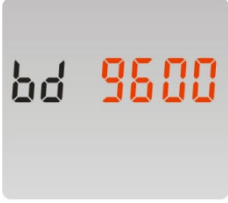
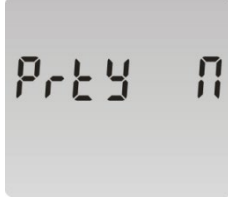

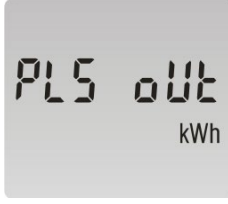

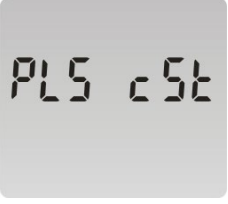
34		<p>Time segment 3</p> <p>Format: Hour, Minute, Tariff</p> <p>Example: 04:00 Tariff 3</p>
35		<p>Time segment 4</p> <p>Format: Hour, Minute, Tariff</p> <p>Example: 05:00 Tariff 4</p>
36		<p>Time segment 5</p> <p>Format: Hour, Minute, Tariff</p> <p>Example: 07:25 Tariff 1</p>
37		<p>Time segment 6</p> <p>Format: Hour, Minute, Tariff</p> <p>Example: 08:11 Tariff 2</p>
38		<p>Time segment 7</p> <p>Format: Hour, Minute, Tariff</p> <p>Example: 15:40 Tariff 3</p>
39		<p>Time segment 8</p> <p>Format: Hour, Minute, Tariff</p> <p>Example: 17:00 Tariff 4</p>
40		<p>Time segment 9</p> <p>Format: Hour, Minute, Tariff</p> <p>Example: 10:00 Tariff 1</p>



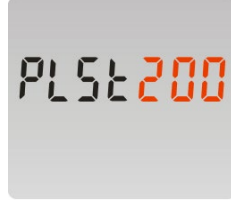
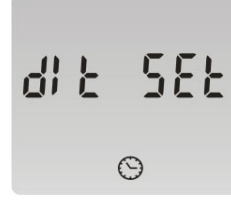
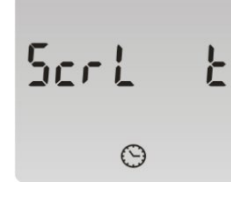
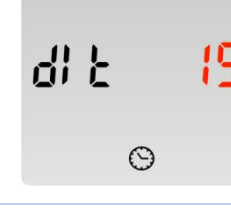
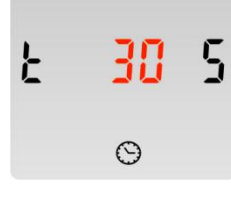
41		Time segment 10 Format: Hour, Minute Tariff Example: 23:00 Tariff 2
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Set-up Mode

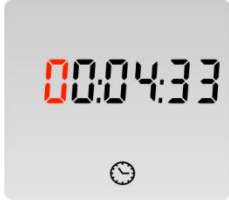
To get into Set-up Mode, the user need press the “Enter” button  for 3 second.

Page	Display	Descriptions
		The setting is done correctly
		The entering information is wrong. The operation fails.
1		Password To get into Set-up mode, it asks a password confirmation. Default password: 1000
2		Address ID Default ID is 001 Range: 001~247
2-1		Press the “Enter” button, the first digit flash. Press the “Scroll” button to change the value. After choosing the new address value, the user need long press the “Enter” button to confirm the setting.

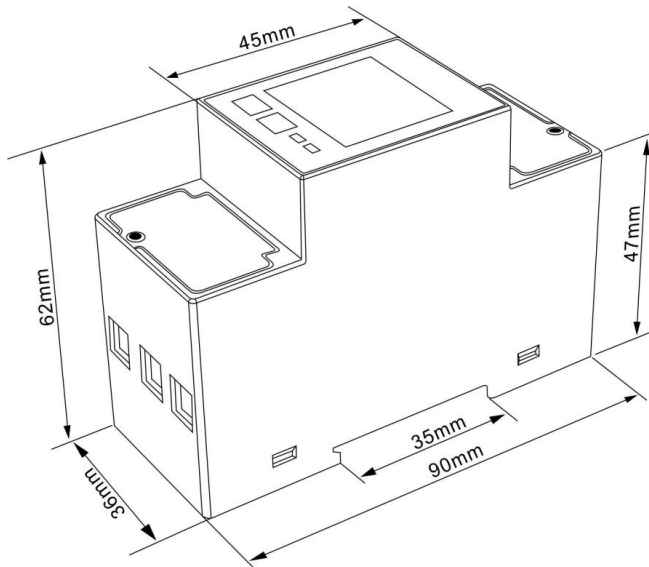
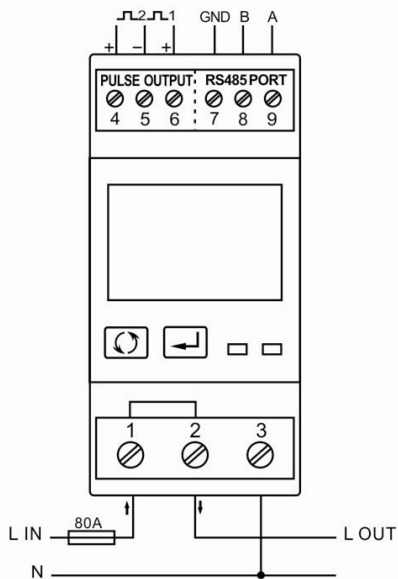
3		Baud rate Default value: 2400bps Range: 1200, 2400, 4800, 9600bps.
3-1		Press the "Enter" button, the red digit flash. Press the "Scroll" button to change the value. After choosing the new baud rate, the user need long press the "Enter" button to confirm the setting.
4		Parity Default: None Option: None, Even, Odd
4-1		Press the "Enter" button, the red part flash. Press the "Scroll" button to change the option. After choosing the new Parity, the user need long press the "Enter" button to confirm the setting.
5		Pulse output Default: Exp. kWh Option : kWh / KVArh / Imp. Kwh / Exp.kWh / Imp.kVArh / Exp.kVArh
5-1		Press the "Enter" button, the red part flash. Press the "Scroll" button to change the option. After choosing the new Pulse output option, the user need long press the "Enter" button to confirm the setting.
6		Pulse constant Default: 1000 Option: 1000 / 100 / 10 / 1

6-1		Press the “Enter” button, the red part flash. Press the “Scroll” button to change the option. After choosing the new Pulse constant option, the user need long press the “Enter” button to confirm the setting.
7		Pulse duration Default: 100mS Option: 200 / 100 / 60ms
7-1		Press the “Enter” button, the red part flash. Press the “Scroll” button to change the option. After choosing the new Pulse duration option, the user need long press the “Enter” button to confirm the setting.
8		Demand Integration Time Default: 15 minutes Option: 5 / 10 / 15 / 30 / 60/ OFF
8-1		Press the “Enter” button, the red part flash. Press the “Scroll” button to change the option. After choosing the new DIT option, the user need long press the “Enter” button to confirm the setting.
9		Automatic Scroll Time Interval Default: 0 S Option: 0 ~ 30S
9-1		Press the “Enter” button, the red part flash. Press the “Scroll” button to change the option. After choosing the new “Scrl” option, the user need long press the “Enter” button to confirm the setting.

10		Reset the demand information
10-1		Press the “Enter” button, the red part flash. Press the “Scroll” button to confirm the resetting of demand information.
11		Password set-up Default: 1000
11-1		Press the “Enter” button, the red part flash. Press the “Scroll” button to change the value. After choosing the new password, the user need long press the “Enter” button to confirm the setting.
12		Date set-up Press the “Enter” button to enter the date set-up page
12-1		Press the “Scroll” button to change the value. After choosing the new value, the user need long press the “Enter” button to confirm the setting. Date format: Day ,Month, Year
13		Time set-up Press the “Enter” button to enter the time set-up page

13-1		<p>Press the “Scroll” button to change the value. After choosing the new value, the user need long press the “Enter” button to confirm the setting.</p> <p>Time format: Hour, Minute, Second</p>
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Wiring and Dimension



Installation

