

# SDM220-Modbus

## *Single-Phase Two Module DIN rail Meters*



Measures kWh, Kvarh, KW, Kvar, KVA, PF, Hz, dmd, V, A, etc.

Bi-directional measurement IMP & EXP

Two pulse outputs

RS485 Modbus

Din rail mounting 35mm

80A direct connection

Better than Class 1 / B accuracy

## Application

The energy-meters “with a blue back-lighted LCD screen for perfect reading” are used to measure single-phase like residential, Utility and Industrial application. The unit measures and displays various important electrical parameters, and provide a communication port for remote reading and monitoring. Bi-directional energy measurement makes the unit a good choice for solar PV energy metering.

## PART 1 Specification

### General Specifications

Voltage AC (Un)	230V
Voltage Range	176~276V AC
Base Current (Ib)	10A
Max. Current (Imax)	80A
Mini Current (Imin)	0.5A
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	1000imp/kWh (default) 100/10/1 imp/kWh/kVarh (configurable)
Display	LCD with blue backlit
Max. Reading	99999.99kWh

**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 EN50470-3
Reactive energy	1% of range maximum

**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 2500m
Warm up time	10s
Installation category	CAT III
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 kVarh.

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

Pulse width: 200/100/60ms

Pulse output 2 is non-configurable. It is fixed up with total 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, 9600

Parity: NONE/EVEN/ODD

Stop bits: 1 or 2

Modbus Address: 1 to 247

## Mechanics

Din rail dimensions	36x92x65 (WxHxD) DIN 43880
Mounting	DIN rail 35mm
Sealing	IP51 (indoor)
Material	self-extinguishing UL94V-0

LCD display

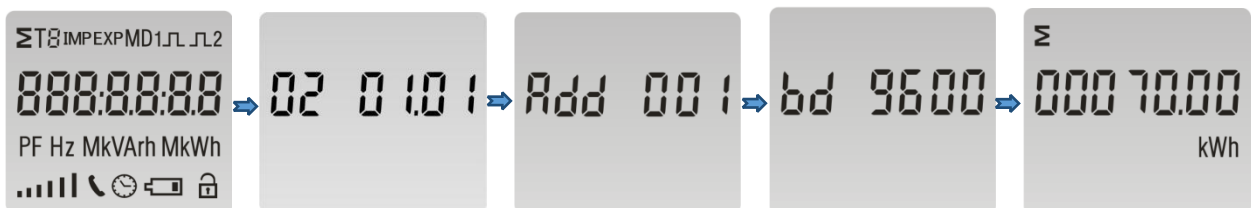
Item	Descriptions
1	7 digits used to display measured values or RTC
2	Total value
4	Import information, Export information
5	Max. Demand for Power or Current
6	Pulse output 1 and Pulse output 2
7	Measurement units
8	PF = power factor Hz = frequency
9	Bar display of Power
10	Communication indicator
11	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.



Full screen → software version → Modbus ID → Baud rate → total kWh

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.







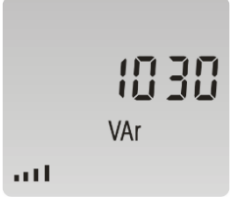
The display order by scroll button :


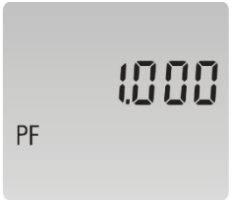
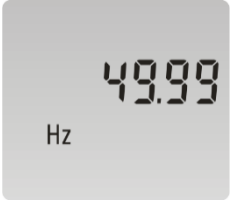

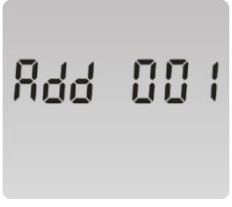
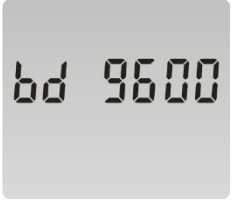
Total kWh → import kWh → export kWh → total kVarh → import kVarh → export kVarh →

Max. power demand → voltage → current → W → Var → VA → power factor →


frequency → pulse constant → Modbus ID → baudrate.

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		Total reactive energy Example: 10.00kVarh

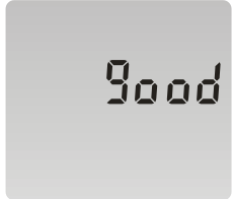


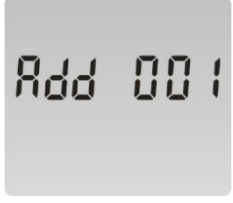

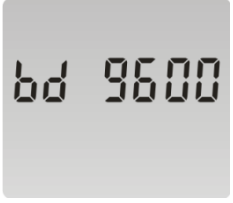
5		<p>Import reactive energy</p> <p>Example: 5.00kVarh</p>
6		<p>Export reactive energy</p> <p>Example: 5.00kVarh</p>
7		<p>Total max. demand</p> <p>Example: 6930W</p>
8		<p>Voltage</p> <p>Example: 229.8V</p>
9		<p>Current</p> <p>Example: 30.156A</p>
10		<p>Active Power</p> <p>Example: 4700W</p>
11		<p>Reactive Power</p> <p>Example: 1030Var</p>

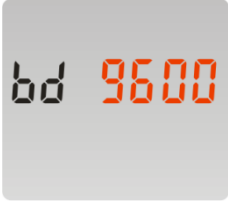
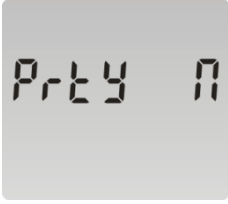

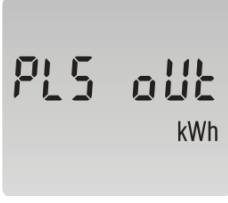

12		<p>Apparent power</p> <p>Example: 4811VA</p>
13		<p>Power factor</p> <p>Example: 1.000</p>
14		<p>Frequency</p> <p>Example: 49.99Hz</p>
15		<p>Pulse Constant</p> <p>Example: 1000</p>
16		<p>Modbus Address</p> <p>Example: 001</p>
17		<p>Baud rate</p> <p>Example: 9600</p>

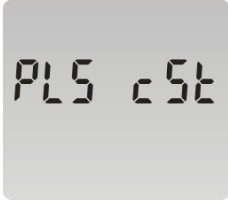



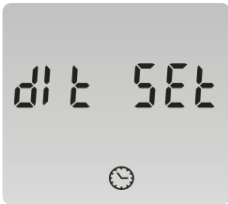
Set-up Mode

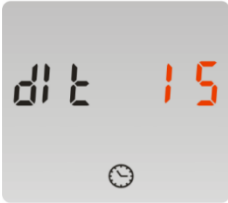
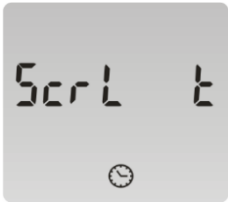
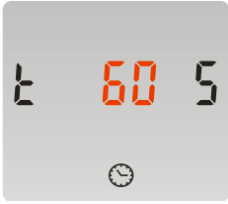


To get into Set-up Mode, the user need press the “Enter” button  for 3 second.



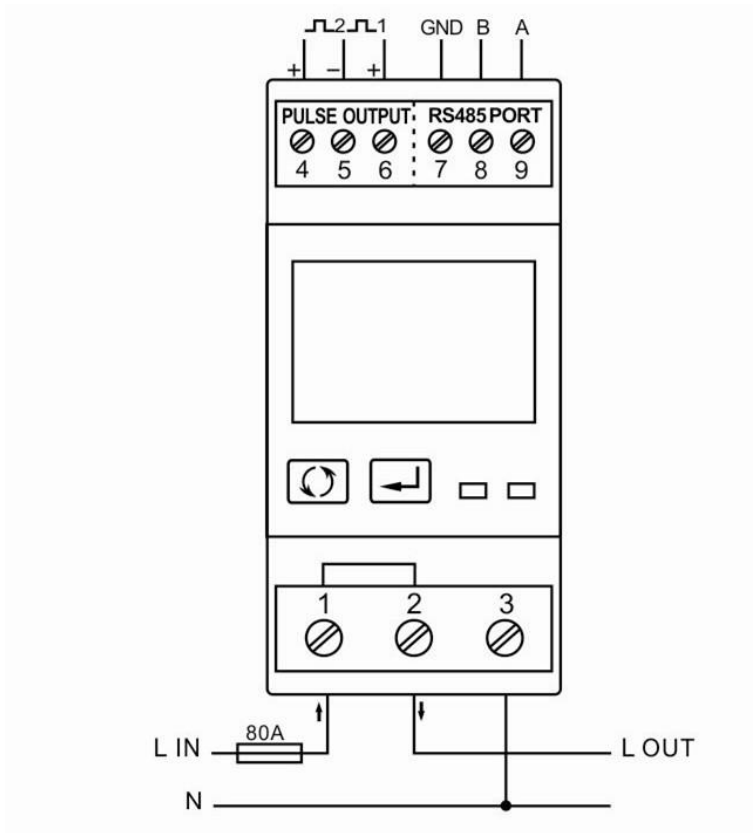
Page	Display	Descriptions
		<p>The setting is done correctly</p>
		<p>The entering information is wrong. The operation fails.</p>
1		<p>Password</p> <p>To get into Set-up mode, it asks a password confirmation.</p> <p>Default password: 1000</p>
2		<p>Address ID</p> <p>Default ID is 001</p> <p>Range: 001~247</p>
2-1		<p>Press the “Enter” button, the first digit flash.</p> <p>Press the “Scroll” button to change the value. After choose the new address value, the user need pressing the “Enter” button to confirm the setting.</p>
3		<p>Baud rate</p> <p>Default value: 9600bps</p> <p>Range: 1200, 2400, 4800, 9600bps.</p>

3-1		<p>Press the “Enter” button, the red digit flash.</p> <p>Press the “Scroll” button to change the value.</p> <p>After choose the new baud rate, the user need pressing the “Enter” button to confirm the setting.</p>
4		<p>Parity</p> <p>Default: None</p> <p>Option: None, Even, Odd</p>
4-1		<p>Press the “Enter” button, the red part flash.</p> <p>Press the “Scroll” button to change the option.</p> <p>After choose the new Parity, the user need pressing the “Enter” button to confirm the setting.</p>
5		<p>Pulse Output</p> <p>Default: kWh</p> <p>Option : kWh / KVarh / Imp. Kwh / Exp.kWh / Imp.kVarh / Exp.kVarh</p>
5-1		<p>Press the “Enter” button, the red part flash.</p> <p>Press the “Scroll” button to change the option.</p> <p>After choose the new Pulse output option, the user need pressing the “Enter” button to confirm the setting.</p>

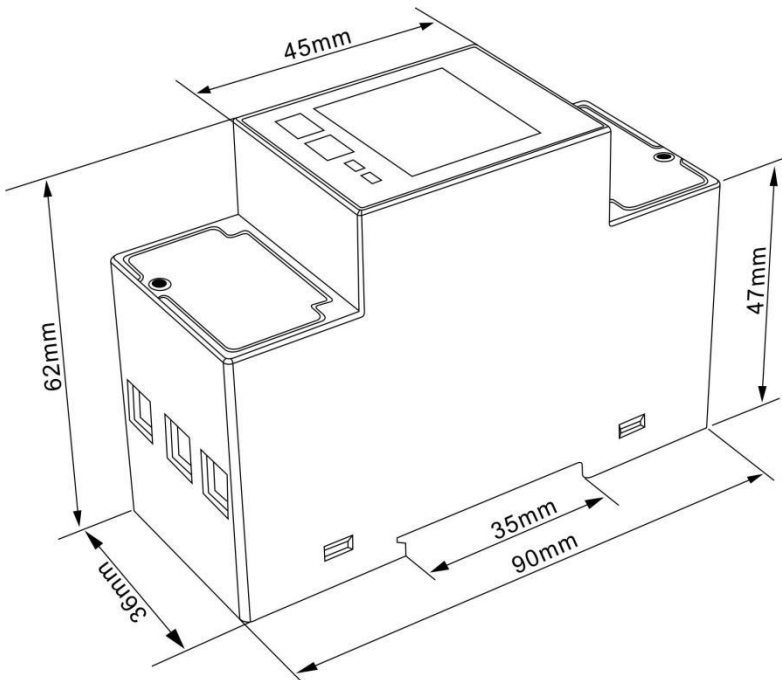
6		<p>Pulse Constant</p> <p>Default: 1000</p> <p>Option: 1000 / 100 / 10 / 1</p>
6-1		<p>Press the “Enter” button, the red part flash.</p> <p>Press the “Scroll” button to change the option.</p> <p>After choose the new Pulse constant option, the user need pressing the “Enter” button to confirm the setting.</p>
7		<p>Pulse duration</p> <p>Default: 100mS</p> <p>Option: 200 / 100 / 60ms</p>
7-1		<p>Press the “Enter” button, the red part flash.</p> <p>Press the “Scroll” button to change the option.</p> <p>After choose the new Pulse duration option, the user need pressing the “Enter” button to confirm the setting.</p>
8		<p>Demand Integration Time</p> <p>Default: 15 minutes</p> <p>Option: 0 / 5 / 10 / 15 / 20 / 30 / 60</p>

<p>8-1</p>		<p>Press the “Enter” button, the red part flash.</p> <p>Press the “Scroll” button to change the option.</p> <p>After choose the new DIT option, the user need pressing the “Enter” button to confirm the setting.</p>
<p>9</p>		<p>Automatic Scroll Time Interval</p> <p>Default: 0 S</p> <p>Option: 0 ~ 60S</p>
<p>9-1</p>		<p>Press the “Enter” button, the red part flash.</p> <p>Press the “Scroll” button to change the option.</p> <p>After choose the new “Scrl” option, the user need pressing the “Enter” button to confirm the setting.</p>
<p>10</p>		<p>Password</p> <p>Default: 1000</p>
<p>10-1</p>		<p>Press the “Enter” button, the red part flash.</p> <p>Press the “Scroll” button to change the value.</p> <p>After choose the new password, the user need pressing the “Enter” button to confirm the setting.</p>

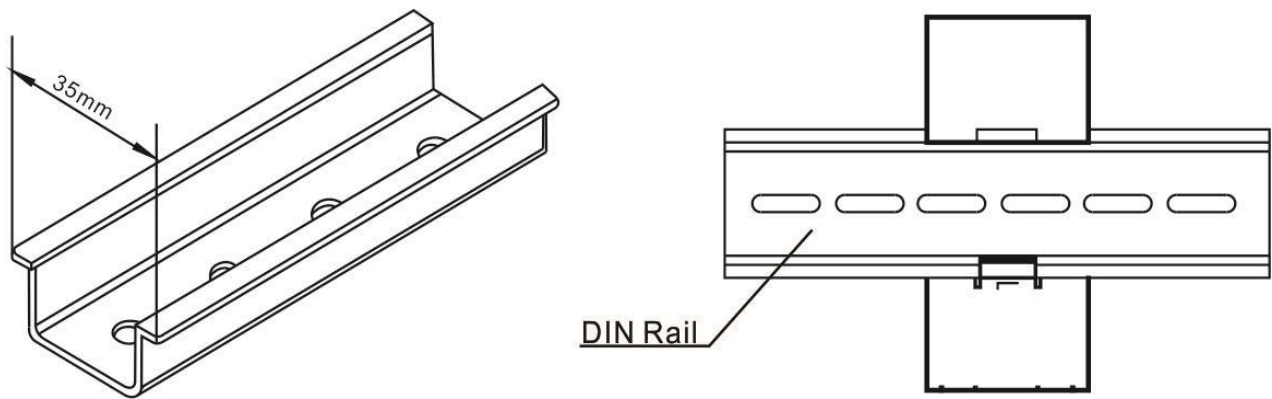
Wiring diagram



Dimensions



Installation



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