Product Overview

SPC-SN-PM-M is a compact, high-precision Particulate matter (PM1.0, PM2.5, and PM10) sensor designed for applications requiring low power consumption and small form factor. It ensures reliable measurements over a wide range. Its RS485 communication interface simplifies integration into small, embedded systems, making it ideal for IoT, HVAC, buildings, and for environmental quality monitoring. The sensor's long-term stability ensures consistent performance in harsh environments (SPCd/Birds), making it a cost-effective solution for long-term deployment.

• Particulate matter sensor with range of 0-1000ug/m3

• Superior sensor performance.

• Operating range -10°C to 60°C for temperature and 0% to 80% RH for humidity

• Fully calibrated and processed digital RS485 Output

• Excellent long-term stability.

Fig.1 - Product Image

Measuring Parameter	Measuring Range	Accuracy
PM 1. 0	0 ~ 1000 ug/m3	5 µg/m3 10 % m.v.
PM 2.5	0 ~ 1000 ug/m3	5 µg/m3 10 % m.v.
PM 10	0 ~ 1000 ug/m3	25 µg/m3 25 % m.v.

Sensor specification

2. Communication:

Start the Sensor: The first step is to power up the sensor with the selected supply voltage (range between 110- 240vAC). Wait for the startup time i.e.,8 seconds.

3. Precautions

1. Read all instructions before using the sensor board.
2. Keep the sensor board away from water and moisture to prevent damage.
3. Do not disassemble or modify the sensor board.
4. Use only the specified power sources and mentioned.

4. Power Supply Connection

- o **DC Connection**
    1. Use 12-24V@ 1A, Power supply.
    2. Don't make loose connection.

5. Configuration Settings

- ➢ Communication Speed   9600 – 115200 Kbps (Software setting)
- ➢ Data Bits   8
- ➢ Parity   None
- ➢ CRC   Yes
- ➢ Slave ID   Software setting(1-247)
- ➢ Function Code   0X03 (Read Holding Register)

Recommended Cable Electrical Characteristics: -

22 AWG Cable	Shielded and twisted pair should be used.
Tinned Copper	Recommended
Nominal Conductor DCR	14.7 ohm / 1000 ft
Nominal Capacitance	11 pf / feet (conductor to conductor)
High Frequency Non-Insertion Loss	0.5db / 100ft

ID	Function Description	Register Description	Modbus Function Code	Protocol	Data Type
1	**Display Baud Rate (Default: 960)**	**40010**	**0x03**	**RS485**	**16-bit int**
2	**Enter New Baud Rate**	**40011**	**0x03**	**RS485**	**16-bit int**
3	**Display Slave ID (Default: 1)**	**40012**	**0x03**	**RS485**	**16-bit int**
4	**Enter New Slave ID**	**40013**	**0x03**	**RS485**	**16-bit int**
5	**Display Parity (Default: None-3 And for Odd-1, Even-2)**	**40014**	**0x03**	**RS485**	**16-bit int**
6	**Enter New Parity**	**40015**	**0x03**	**RS485**	**16-bit int**
7	**Display Stop Bit (start-2/stop bit-1)**	**40016**	**0x03**	**RS485**	**16-bit int**
8	**Enter New Start/ Stop Bit**	**40017**	**0x03**	**RS485**	**16-bit int**

6. Modbus RS485 Data Storage register

| ID	Function Description	Register Description	Modbus Function Code	Protocol	Data Type
1	**PM1.0**	**40000**	**0x03**	**RS485**	**16-bit int**
2	**PM2.5**	**40001**	**0x03**	**RS485**	**16-bit int**
3	**PM10**	**40002**	**0x03**	**RS485**	**16-bit int**

Important Note:

1. If you want to enter the baud rate 9600/19200/38400/57600/115200etc, enter it like this 960/1920/3840/5760/11520etc.
2. After that press the reset button or reboot the system.
3. Then you will get the present value of 11520 at 40010 baud rate (115200) and 10 at 40012 slave id.
4. PM1.0, PM 2.5, PM 10 in ug/m3 Data are provided in the multiple of 10, for the sake of higher resolution, you need to divide it by 10 to obtain the actual reading. Example. PM 1.0 = 912/100 = 91.2 ug/m3.
5. Baudrate is provided in devised of 10. Example. Baudrate 960*10=9600.

7. Modbus Configuration

Here is an example of receiving data on Mb poll software.

- Open Mb-poll software connect using configuration setting (Default baud rate is 9600 and slave id is 1).

- After connecting you will get data as shown below
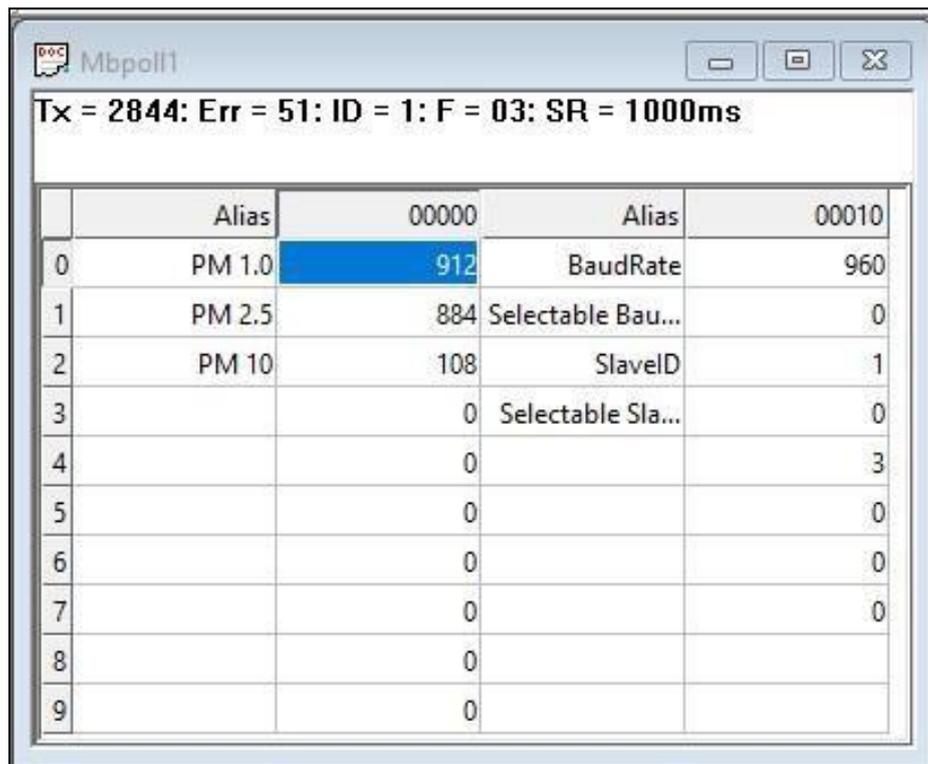
	Alias	00000	Alias	00010
0	PM 1.0	912	BaudRate	960
1	PM 2.5	884	Selectable Bau...	0
2	PM 10	108	SlaveID	1
3		0	Selectable Sla...	0
4		0		3
5		0		0
6		0		0
7		0		0
8		0		
9		0		

Tx = 2844: Err = 51: ID = 1: F = 03: SR = 1000ms

- As you can see in the image above, the resistor 40010 – 960 represents the present bund rate (9600) of the board and 40012 – 1 represents the present slave id of the board.
- To change the baud rate and slave id you must enter a value on the 40011 resistors for the baud rate and 40013 for the slave id as shown in the image below.
- Now you can see data. In below image set 115200 baud rate and slave ID 10.

Mbpoll1

Tx = 2877: Err = 51: ID = 1: F = 03: SR = 1000ms

	Alias	00000	Alias	00010
0	PM 1.0	912	BaudRate	960
1	PM 2.5	884	Selectable Bau...	0
2	PM 10	108	SlaveID	1
3		0	Selectable Sla...	0
4		0		3
5		0		0
6		0		0
7		0		0
8		0		
9		0		

Write Single Register

Slave ID: 1 — Send
Address: 11 — Cancel
Value: 11520

Result
N/A
☑ Close dialog on "Response ok"

Use Function
● 06: Write single register
○ 16: Write multiple registers

Mbpoll1

Tx = 2910: Err = 51: ID = 1: F = 03: SR = 1000ms

	Alias	00000	Alias	00010
0	PM 1.0	912	BaudRate	960
1	PM 2.5	884	Selectable Bau...	11520
2	PM 10	108	SlaveID	1
3		0	Selectable Sla...	0
4		0		3
5		0		0
6		0		0
7		0		0
8		0		
9		0		

Write Single Register

Slave ID: 1 — Send
Address: 13 — Cancel
Value: 10

Result
N/A
☑ Close dialog on "Response ok"

Use Function
● 06: Write single register
○ 16: Write multiple registers

Tx = 2944: Err = 55: ID = 1: F = 03: SR = 1000ms

	Alias	00000	Alias	00010
0	PM 1.0	912	BaudRate	11520
1	PM 2.5	884	Selectable Bau...	0
2	PM 10	108	SlaveID	10
3		0	Selectable Sla...	0
4		0		3
5		0		0
6		0		0
7		0		0
8		0		
9		0		

Hard reset Setting

Somehow you forgot the baud rate or slave id of the board then remove the jumper (as shown in the image) from the board reboot the system or press the reset button (given on the board). Then you will get the default baud rate of 9600 and slave id 1.

RS485 Default

RESET Switch
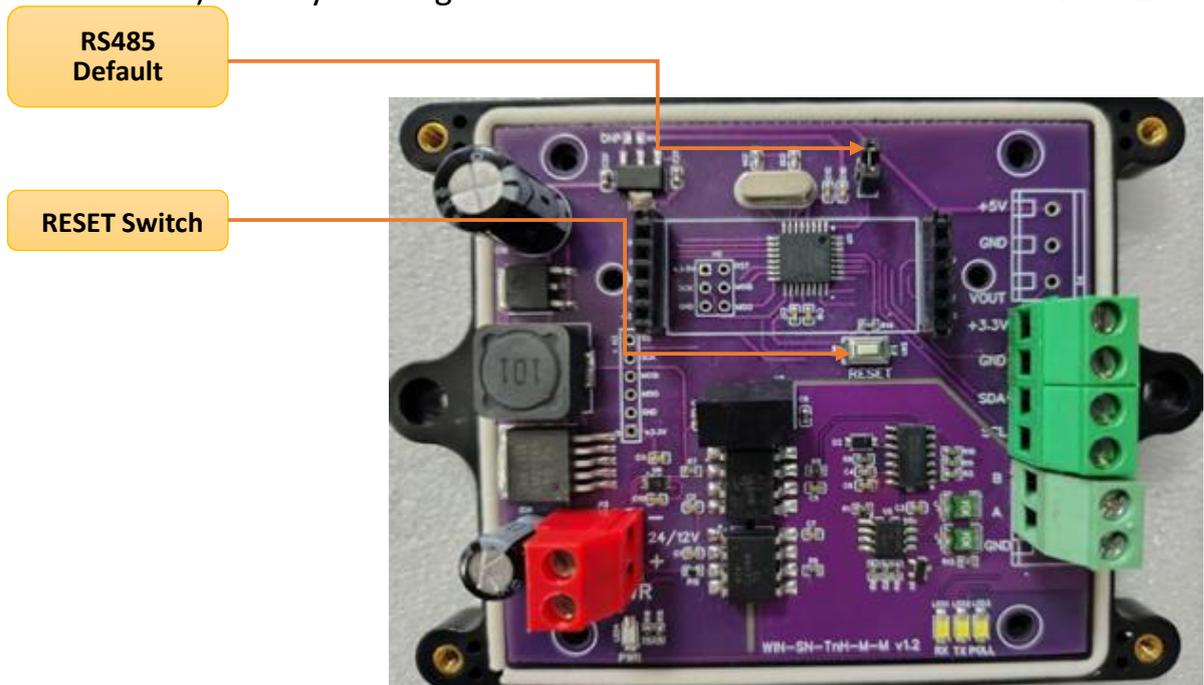
Contact Information:

SHREEM PETROCHEM
AHMEDABAD 380015 – INDIA.
shreempetrochem@gmail.com