

Nova PM sensor SDS011 High Precision Laser pm2.5 Air Quality Detection Sensor



Product Description

This product uses the laser scattering principle to obtain the concentration of suspended particles in the air from 0.3 to 10 microns.

Note: This product supports 5V power supply voltage, output signal TTL. The output signal TTL is 5V, higher than this voltage, the product will burn out. Please keep in mind!

Pin Definition Parameters

CTL: control pin, spare

1um: >0.3 micron particle concentration, PWM output

5V: 5V power input

25um: >2.5µm-particle concentration, PWM output

GND: Ground

R: Serial port receive RX

T: Serial port transmit TX

Note: The interface pitch is 2.54 pitch, and the 90-degree pin connector is used without special instructions.

Specification Parameters

Measurement output: PM2.5, PM10

Range: 0.0-999.9 ug/m3

Supply voltage: DC 5V

Large working current: 100mA

Sleeping current: 2mA

Operating temperature range: -20~50°C

Response time: 1sec

Serial data output frequency: 1 time/sec

Particle diameter resolution: 0.3 micron

Relative error: 10%

Product Size: 71x70x23mm

Communication Protocol

Serial communication protocol: 96008N1 (rate 9600, data bit 8, parity bit none, stop bit 1)

Serial communication cycle: 1+0.5 sec.

Data frame (10 bytes): header + command number + data (6 bytes) + checksum + end of message

Byte number	Name	Remarks
0	Header	AA
1	Command number	C0
2	Data 1	PM2.5 low byte
3	Data 2	PM2.5 high byte
4	Data 3	PM10 low byte
5	Data 4	PM10 high byte
6	Data 5	0 (Reserved)
7	Data 6	0 (Reserved)
8	Checksum	Checksum
9	End of message	AB

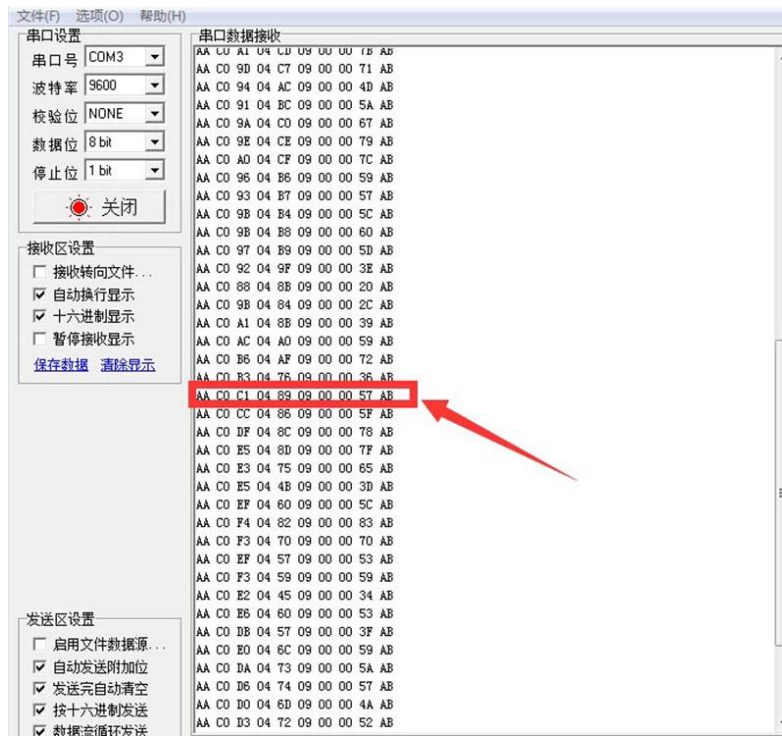
Checksum: Sum of bytes from data 1 to data 6.

PM2.5 data content: $PM2.5(ug/m3) = ((PM2.5 \text{ high byte} * 256) + PM2.5 \text{ low byte}) / 10 \text{ byte} / 10$

PM10 data content: $PM10(ug/m3) = ((PM10 \text{ high byte} * 256) + PM10 \text{ low byte}) / 10$

Usage

1. Install the USB to TTL driver software first.
2. Connect the USB to TTL serial cable to the PM2.5 sensor and plug it into the computer.
3. After power on, open the serial port debugging assistant software, select the serial port used by the USB to TTL serial line, and use 9600 baud rate. (Download the serial port debugging assistant from <http://www.gu-wen.com/Product/260.html>)
4. Receive the data as follows



5. Here is a randomly selected set of data for calculation, such as the red box in the above figure: AA C0 C1 04 89 09 00 00 57 AB

Specific meaning:

AA---- message header

C0---- command number, the customer develops the product, see the reception of a CO, that is Indicates that it is a signal output by the PM2.5 sensor

C1----PM2.5 low byte

04----PM2.5 high byte

89----PM10 low byte

09----PM10 high byte

00---- reserved bit, not used for the moment, can be used as the ID of the sensor (when multiple sensors are used at the same time, in order to facilitate the use of the sensor).

can be used as sensor ID (when multiple sensors are used at the same time, so as to facilitate the distinction)

00---- reserved bit, not yet used, can be used as the ID of the sensor (when multiple sensors are used at the same time, in order to distinguish).

The 00 reserved bit, not yet used, can be used as the ID of the sensor (when multiple sensors are used at the same time, in order to distinguish)

57---- checksum, i.e. $C1+04+89+09+00+00=157$ (i.e. 0X0157)

Omit the high byte, keep the low byte.

AB---- end of message

Because the output is hexadecimal data, please convert it to a decimal number for

Please convert it to decimal number for calculation.

Calculation of PM2.5 value:C1 04

Low byte C1: $12*16+1=193$

High byte 04: $0 \times 16 + 4 = 4$

$((\text{PM2.5 high byte} \times 256) + \text{PM2.5 low byte}) / 10$

$(4 \times 256 + 193) / 10 = 121.7 \mu\text{g}/\text{m}^3$

Calculation of PM10 value: 89 09

Low byte 89: $8 \times 16 + 9 = 137$

High Byte 09: $0 \times 16 + 9 = 9$

$((\text{PM10 high byte} \times 256) + \text{PM10 low byte}) / 10$

$(9 \times 256 + 137) / 10 = 244.1 \mu\text{g}/\text{m}^3$

Checksum: 57 C1+04+89+09+00+00