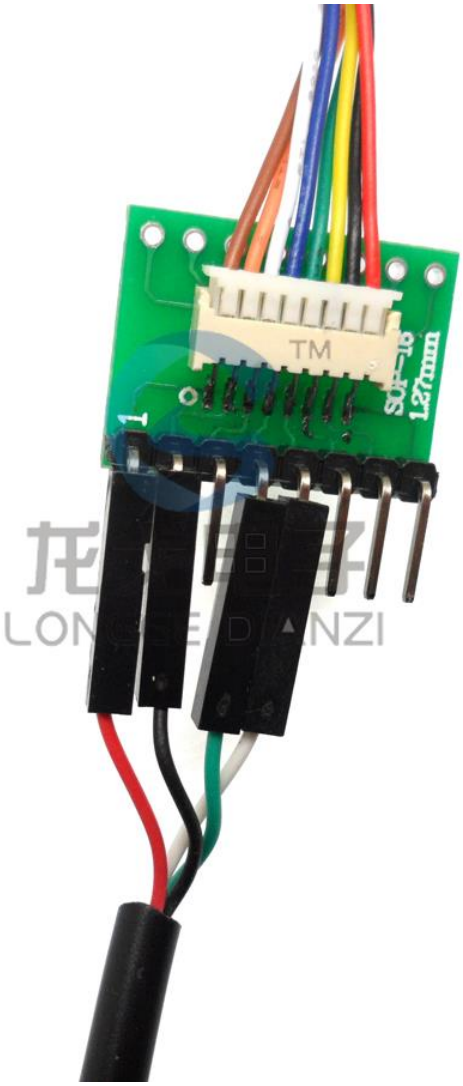
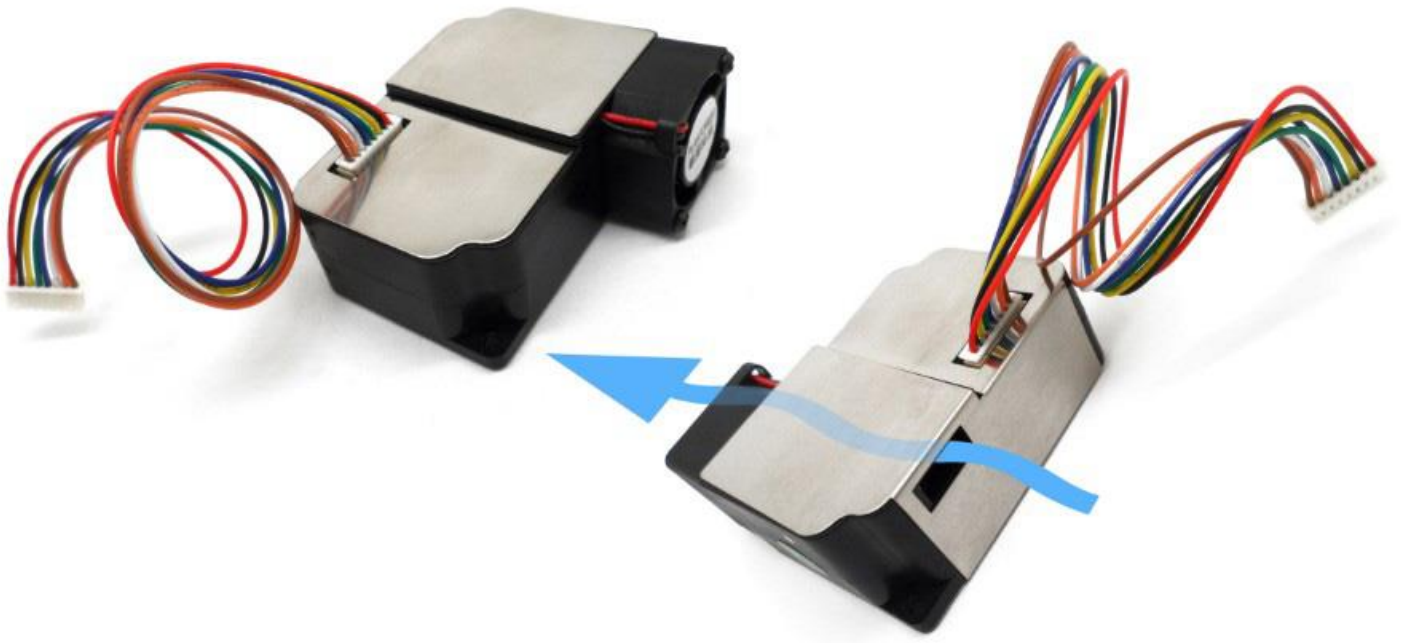
Laser dust sensor

(With adapter cable, connected directly to the computer USB port)


TM
SOP-16
1.27mm
1

Laser dust sensor

PM1.0 PM2.5 PM10



Product name: high accuracy laser type PM1.0 PM 2.5 PM10 Dust Sensor module

Description: PMS3003 Using laser light scattering principle to get air 0.3 ~ 10 Micron particulate concentration, stable and reliable data;
Built-in fan, digital output, high integration;

Features
Data is accurate: laser testing, stability, consistency;
Quick response: scene change response time is less than 10 Seconds;
Ease of integration: serial output (or IO Output port can be customized), comes with A fan;

High resolution: resolution smallest particle diameter 0.3 Micron;

Scope of application:
PM1.0 PM2.5 PM10 Detectors, cleaners;

Working principle

Using laser light scattering principle: when the laser light to detect the location of Particles will produce a faint light Scattering, the scattering of light in particular directions of wave and particle diameters,Through the different particle size of waveform classification system Taking into account the conversion formula you can get different sizes of particles in real time Concentration, in accordance with the calibration method Official unit of concentration;

Technical parameters:

1 Measurement diameters: 0.3-1.0um 1.0-2.5um 2.5-10um

2 Measurement units: ug/m3

3 Measurement accuracy: ug/m3

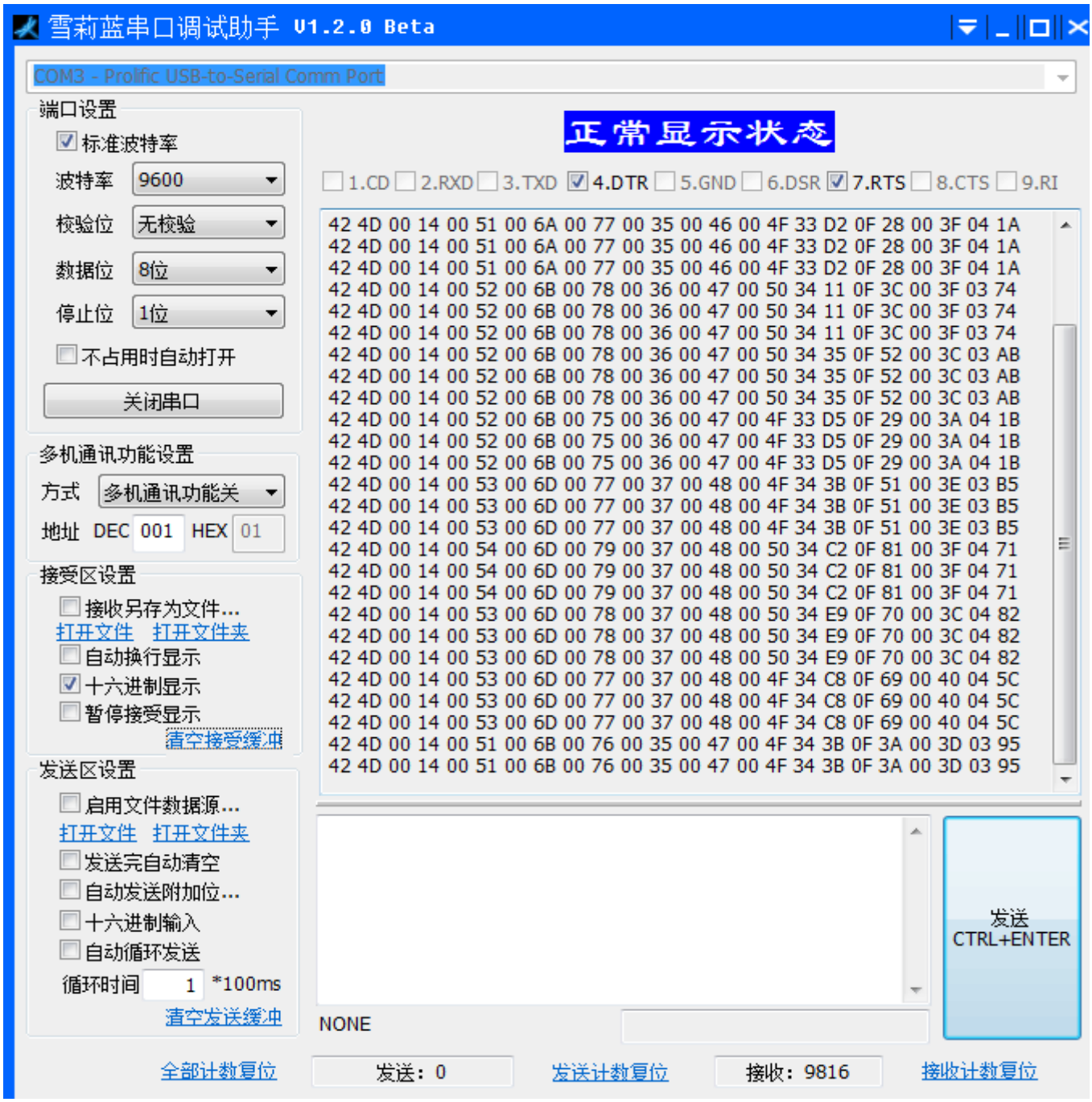
4 Response time: <10s

5 Work current: 5V200ma@ Work State 5V2ma@ Standby Fitness

6 Data interface: serial (3.3VTTL Level)

7 Module dimensions: 65x42x23mm

Laser dust serial data display:



Start character 1		0x42 (Fixed)
Start character 2		0x4d (Fixed)
Frame length upper eight bits	.....	Frame length = 2×9+2 (Data + check digit)
Frame length lower eight bits	.....	
Data 1 upper eight bits	.....	Data 1 represents PM1.0 concentration (CF=1, standard particulate matter) Units ug / m3
Data 1 lower eight bits	.....	
Data 2 upper eight bits	.....	Data 2 represents PM2.5 concentration (CF=1, standard particulate matter) Units ug / m3
Data 2 lower eight bits	.....	
Data 3 upper eight bits	.....	Data 3 represents PM10 concentration (CF=1, standard particulate matter) Units ug / m3
Data 3 lower eight bits	.....	
Data 4 upper eight bits	.....	Data 4 represents PM1.0 concentration (Atmospheric Environment) Units ug / m3
Data 4 lower eight bits	.....	
Data 5 upper eight bits	.....	Data 5 represents PM2.5 concentration (Atmospheric Environment) Units ug / m3
Data 5 lower eight bits	.....	
Data 6 upper eight bits	.....	Data 6 represents PM10 concentration (Atmospheric Environment) Units ug / m3
Data 6 lower eight bits	.....	
Data 7 upper eight bits	.....	Data 7 (Retention)
Data 7 lower eight bits	.....	
Data 8 upper eight bits	.....	Data 8 (Retention)
Data 8 lower eight bits	.....	
Data 9 upper eight bits	.....	Data 9 (Retention)
Data 9 lower eight bits	.....	
Data and check upper eight bits	.....	Checksum = Start character 1+ start character 2 + ... + data 9 lower eight bits
Data and check lower eight bits	.....	

Data 1.2.3 Read the to value is a TSI For standard data.

Data 4.5.6 Reading to the value of value is an atmosphere as the standard.

TSI Profile

TSI As a leader in the design and production of precision measuring instruments, TSI Collaborative researchinstitutes as well as customers around the world for many disciplines of measuring instruments Development of standards, including: atmospheric sciences, airflow, fluid dynamics, indoor air quality, and bio-hazardous. Located in United States territory's corporate headquarters And local offices throughout Europe and Asia makes TSI Every corner of the world. Every day, our dedicated staff in turning research into reality.

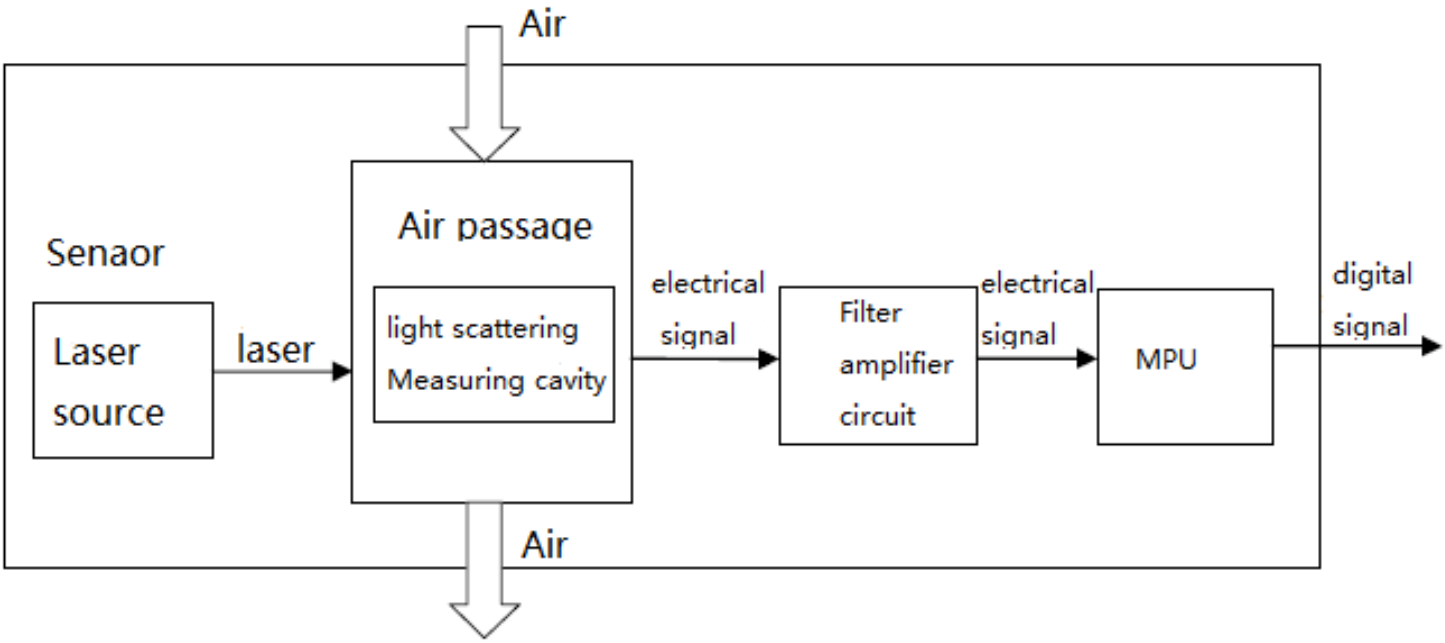
Sensor profile

PMS3003 is a digital universal particle concentration sensor, which can be used to obtain the number and mass of suspendedparticles in the air in the unit volume, that is, the particle concentration, and the output of the digital interface. The sensor can be embedded in a variety of airborne particulate matter concentration related instruments or environmental improvement equipment, to provide timely and accurate concentration of data.

Working principle

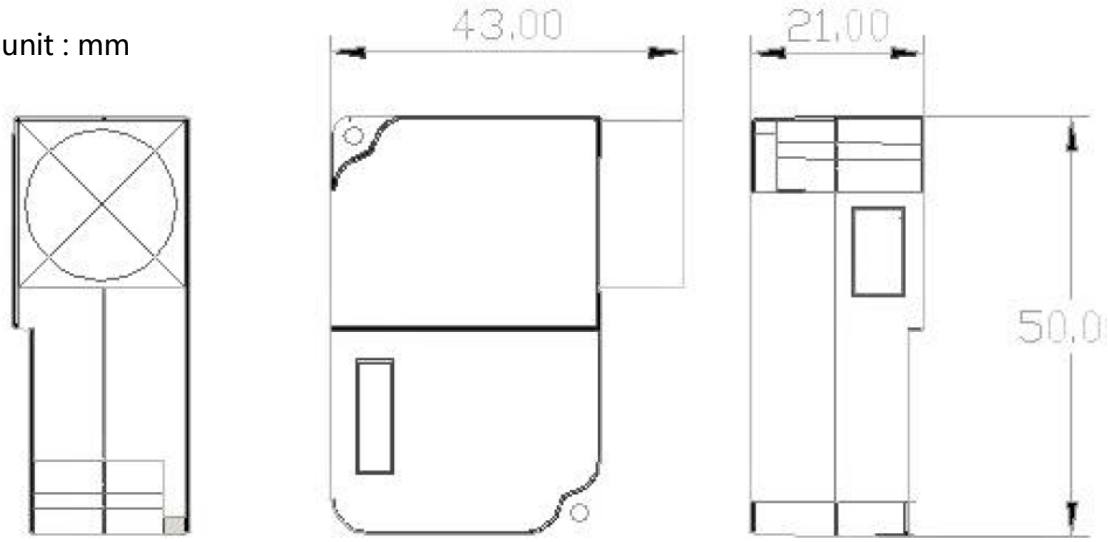
The sensor adopts the principle of laser scattering. Even if the laser irradiation in air suspended particles produce scattering, also in a certain angle to collect light scattering, the scattering intensity with time change curve.Then use the microprocessor based on Mie theory (MIE) algorithm,The equivalent particle size and the number of particles in the unit volume of the particle size were obtained.

The function diagram of sensor as shown below:



Size

unit : mm



Main characteristics

- Zero error alarm rate
- Real-time response
- Accurate data
- Minimum resolution 0.3μm

Technical index:

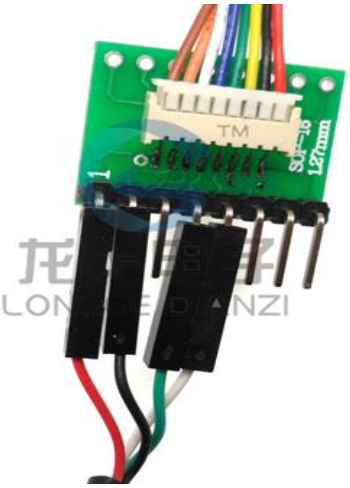
parameter	index	unit
measuring range	0.3~1.0 1.0~2.5 2.5~10	μm
Quasi volume	50%·0.3um 98%@>=0.5um	
response time	0.1	L
working voltage	≤10	S
Maximum operating current	DC 5	V
Standby current	120	mA
Data interface level	≤200	μA
Data interface level	L<0.8@3.3 H>2.7@3.3	V
Working temperature range	-20~50	℃
Working humidity range	10~85%(non-condensing)	RH
Storage temperature range	-20~65	℃
Storage humidity range	0~95%(non-condensing)	RH
Mean time to failure	≥3	Year
size	50*43*21	mm

Digital interface

1. digital interface

   Data interface: 2 pin for the serial data communication interface, the use of universal asynchronous receiver and receiver (UART); 1 pin for the control signal interface, the use of high and low level control, all the high average 3.3VTTL level.

2. Interface pin definition (See figure below)



Red = VCC Black = GND
Green = RXD White = TXD

3. Digital interface pin definition(See table below)

PIN1	VCC	DC5V
PIN2	GND	GND
PIN3	SET	Set pin /TTL level @3.3V
PIN4	RXD	Serial port receiving pin /TTL level @3.3V
PIN5	TXD	Serial port to send the pin /TTL level @3.3V
PIN6	RESET	Module reset signal /TTL level @3.3V
PIN7/8	NC	NC

Note:

SET = 1 (Gao Dianping) when the module works in a continuous sampling mode, the module at the end of each sampling after the sampling data, the sampling response time is less than 600ms, the data update time is less than 2S.

SET = 0 (low level) module to enter low power standby mode

The following table defines the data for the module(PMS3003): 24 bytes
The default serial baud rate: 9600Kbps
Check bit: no
Stop bit: 1

Start symbol 1	0x42(fixed)	
Start symbol 2	0x4d(fixed)	
Frame length high eight bit	.....	Frame length=2*9+2(Data+check bit)
Frame length low eight bit	.....	
Data 1 high eight bit	.....	Data 1 indicates PM1.0 concentration (CF = 1, standard particulate matter) Unit: μg/m³
Data 1 low eight bit	.....	
Data 2 high eight bit	.....	Data 2 indicates PM2.5 concentration (CF = 1, standard particulate matter) Unit: μg/m³
Data 2 low eight bit	.....	
Data 3 high eight bit	.....	Data 3 indicates PM10 concentration (CF = 1, standard particulate matter) Unit: μg/m³
Data 3 low eight bit	.....	
Data 4 high eight bit	.....	Data 4 indicates PM1.0 concentration (Atmospheric environment) Unit: μg/m³
Data 4 low eight bit	.....	
Data 5 high eight bit	.....	Data 5 indicates PM2.5 concentration (Atmospheric environment) Unit: μg/m³
Data 5 low eight bit	.....	
Data 6 high eight bit	.....	Data 6 indicates PM10 concentration (Atmospheric environment) Unit: μg/m³
Data 6 low eight bit	.....	
Data 7 high eight bit	.....	Data 7(Retain)
Data 7 low eight bit	.....	
Data 8 high eight bit	.....	Data 8(Retain)
Data 8 low eight bit	.....	
Data 9 high eight bit	.....	Data 9(Retain)
Data 9 low eight bit	.....	
Data and check high eight bit	.....	Check code= Start symbol 1+ Start symbol 2+.....+Date 9 low
Data and check low eight bit	.....	

Note:
Collecting data is data for atmospheric environment. Data 4=PM1.0 Data 5=PM2.5 Data 6=PM10.
This module can be directly connected to the computer, the data line driver for CH340, please download the corresponding drive file according to different system.