

Laser PM2.5 Sensor specification

Product model: SDS011

Version : V1.0

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Overview

SDS011 uses the principle of laser scattering in the air, can be obtained from 0.3 to 10 microns suspended particulate matter concentration, the data is stable and reliable; the built-in fan, digital output, high degree of integration.



Characteristics

- NO1.The accurate data: laser detection, stable, good consistency;
- NO2.Quick response: scene change response time of less than 10 seconds;
- NO3.Facilitate the integration: the serial output (or IO output can be customized), fan;
- NO4.The high resolution: the resolution up to 0.3 micron minimum diameter of particles;

Working principle

Using laser scattering principle:

when the laser beam through the detecting position particle will produce weak light scattering, light scattering wave and particle in a particular direction is related to the diameter of the particle number concentration, through different waveform classification size statistics and conversion formula can get different size particles in real-time, calibration method to get mass concentration of unified with the official unit;

Technical parameters

Number	Project	Parameter	Note
1	Measurement parameters	PM2.5,PM10	
2	Range	0.0-999.9 micro-grams / cubic meter	
3	Power supply voltage	5V	
4	Maximum working current	220mA	
5	Sleep current	2mA	
6	Working temperature range	-20-50°C	
7	Corresponding time	1 sec	
8	Serial data output frequency	1 times / sec	
9	Particle diameter resolution	< 0.3 micron	
10	Error	5%	

11	Product size	71x70x23mm	without inlet hose
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product size:

L*W*H=71*70*23mm

Interface specification:

connector pin-out	Name	comment
1	CTL	control pin, backup
2	1um	PM2.5 0-999ug/m ³ ,PWM Output
3	5V	5V Input
4	25um	PM10 0-999 ug/m ³ ,PWM Output
5	GND	ground
6	R	RX of UART (TTL)
7	T	TX of UART (TTL)

PS: The distance between each pin is 2.54mm.

The UART communication protocol:

bit rate : 9600

Data bit : 8

parity bit: NO

stop bit : 1

The number of bytes	Name	Backup
0	Message	AA

	header	
1	Commander No.	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	Check-sum	Check-sum
9	message tail	AB

Check-sum: Check-sum=DATA1+DATA2+...+DATA6 。

PM2.5 value: $PM2.5 (ug/m^3) = ((PM2.5 \text{ High byte} * 256) + PM2.5 \text{ low byte}) / 10$

PM10 value: $PM10 (ug/m^3) = ((PM10 \text{ high byte} * 256) + PM10 \text{ low byte}) / 10$

PWM Output description

Range of PM2.5 value	0-999ug/m ³
Range of PM10 value	0-999ug/m ³
Cycle:	1004ms ± 1%
high level output at the beginning of the whole cycle:	2ms
The middle of this cycle	1000ms ± 1%

low level output at the end of the whole cycle:

2ms

Schematic diagram of output:

