

HK-A5 Laser PM2.5/10 Sensor

Main characteristics

- ◆ The data is accurate
- ◆ The quick response
- ◆ The standard serial digital output
- ◆ The two-stage multipoint calibration curve
- ◆ The smallest particle size of 0.3 microns



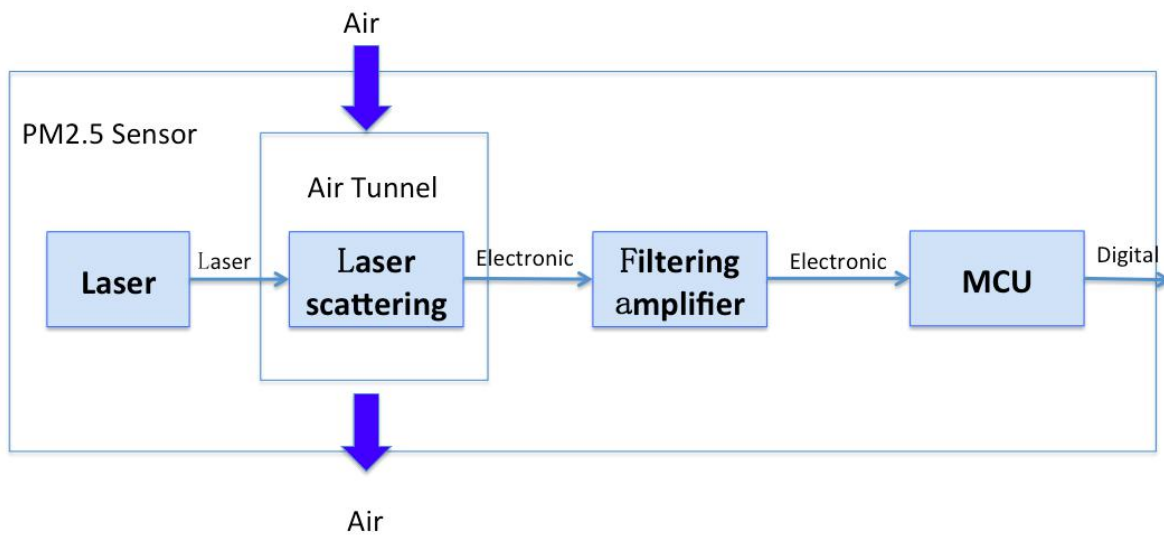
Overview

HK-A5 is a universal digital particle density sensor, can be used to obtain in unit volume of air in 0.3 ~ 10 microns suspended particulate matter number, i.e., particle concentration and output in the form of digital interface and output of each of the particles in the quality of data. The sensor can be embedded in a variety of airborne particulate matter concentration related instruments or air purifier 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. Microprocessor data collection, through the Fourier transform get the relationship between time domain and frequency domain, followed by a series of complicated algorithms that particles of equivalent grain size and per unit volume of different particle size of particle number. The functional block diagram of the sensor is shown in the following figure:



Technical specifications

Sensor Technical specifications		
Parameter	Index	Unit
measuring range	0.3~10	Micron (um)
range	0~999	ug/m3
Count accuracy	50%@0.3um、98%@≥0.5 um	%
Quasi volume	0.1	L (L)
Response time	≤10	Second (s)
DC power voltage	5.0	Volts (V)

Maximum operating current	120	mA (mA)
Standby current	≤200	uA (uA)
Operating temperature range	-20~+50	Degrees Celsius (c)
Working humidity range	0~80%	RH
Mean time to failure	≥5	Year (Y)
Maximum size	46×35×20	mm (mm)

Output result

The main output is the number of particles in the unit volume, the unit volume is 0.1 litres.

Interface



description

Digital interface pin definition

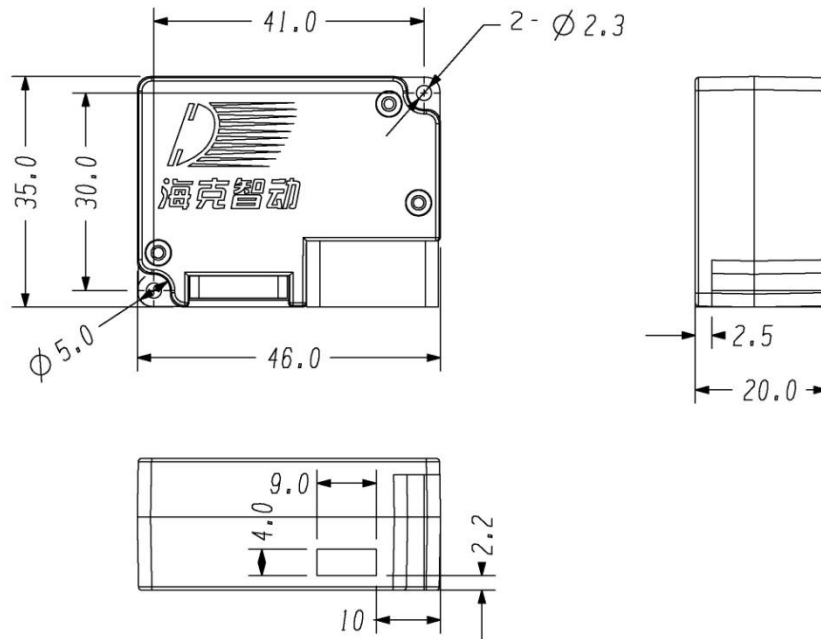
Pin serial number electrical name function description	Pin serial number electrical name function description	Pin serial number electrical name function description
VCC PIN1 power supply (5V, voltage more stable data is more stable)	VCC PIN1 power supply (5V, voltage more stable data is more stable)	VCC PIN1 power supply (5V, voltage more stable data is more stable)
GND PIN2 power supply	GND PIN2 power supply	GND PIN2 power supply
SET PIN3 sleep set pin (3.3V level)	SET PIN3 sleep set pin (3.3V level)	SET PIN3 sleep set pin (3.3V level)
RXD PIN4 serial port receiving pin (3.3V level)	RXD PIN4 serial port receiving pin (3.3V level)	RXD PIN4 serial port receiving pin (3.3V level)
TXD PIN5 serial port to send pin (3.3V level)	TXD PIN5 serial port to send pin (3.3V level)	TXD PIN5 serial port to send pin (3.3V level)
RESET PIN6 module reset signal (low reset, no use when hanging or pulled high)	RESET PIN6 module reset signal (low reset, no use when hanging or pulled high)	RESET PIN6 module reset signal (low reset, no use when hanging or pulled high)
NC PIN7\8 hanging	NC PIN7\8 hanging	NC PIN7\8 hanging

Note: SET=1 module works in the continuous sampling mode, the module at the end of each sample after the initiative to upload the sample data, the sampling response time is 1S.

SET=0 module to enter low power standby mode.

RESET module reset signal, this pin users can not have to operate.

Dimension unit: mm (mm)



Communication protocol

Serial baud rate: 9600; parity: none; stop: 1; fixed packet length is 32 bytes.

Start symbol 1	0x42	(fixed)
Start symbol 2	0x4d	(fixed)
Frame length high eight	.....	The frame length = 2x13+2 (data and parity)
Frame length low eight bit	.....
Data 1 high eight	.....	The data of the 1 said the concentration of PM1.0, ug/m3
Data 1 low eight	.....
Data 2 high eight	.....	The data of the 2 said the concentration of PM2.5, ug/m3
Data 2 low eight	.....
Data 3 high eight	.....	The data of the 3 said the concentration of PM10, ug/m3
Data 3 low eight	.....
Data 4 high eight	.....	Internal test data 1, user retention.
Data 4 low eight	.....
Data 5 high eight	.....	Internal test data 2, user retention.
Data 5 low eight	.....
Data 6 high eight	.....	Internal test data 3, user retention.
Data 6 low eight	.....
Data 7 high eight	.....	Data 7 indicates that the number of particles in the air of 0.1 litres is more than 0.3um
Data 7 low eight	.....



Data 8 high eight	.....	Data 8 indicates that the number of particles in the air of 0.1 litres is more than 0.5um
Data 8 low eight	.....
Data 9 high eight	.....	Data 9 indicates that the number of particles in the air of 0.1 litres is more than 1.0um
Data 9 low eight	.....
Data 10 high eight	.....	Data 10 indicates that the number of particles in the air of 0.1 litres is more than 2.5um
Data 10 low eight	.....
Data 11 high eight	.....	The data of the 11 said 0.1 litres of air in more than 5.0um in diameter of particle number
Data 11 low eight	.....
Data 12 high eight	.....	The data of the 12 said 0.1 litres of air in more than 10um in diameter of particle number
Data 12 low eight	.....
Data 13 high eight	.....	The internal test data 4, user retention.
Data 13 low eight	.....
Data and calibration high eight	.....	Check code = (start symbol 2+ start symbol 1+..... 13 low eight)
Data and check low eight bit	.....

Power quality requirements

- 1, the ripple is less than 100mV.
- 2, power supply voltage stability: 4.95 ~ 5.05V.
- 3, power supply: greater than 1W (current greater than 200mA).
- 4, upper and lower voltage power supply voltage of the system is less than the impact of 50%.