NiuBoL

connect the sensor to the corresponding interface on the collector.

2. If the transmitter is purchased separately, the matching line sequence of the transmitter is:

Line color	Output signals		
			communication
Red			+
Black（Green）			-
Yellow			A
Blue			B

Product introduction

PM2.5, PM10, and integrated sensors use the principle of laser scattering, which can sensitively detect PM2.5 and PM10 concentrations in the environment. Imported lasers and photosensitive components are used, and the data is stable and reliable; built-in fan, high integration; The sensor can be changed as needed power supply voltage and output signal type.

Technical Parameters

Measuring range: PM2.5:0-1000 μg/m3
                PM10 : 0-2000 μg/m3
Relative error:
PM2.5, PM10: ±15% and ±10 μg/m3 maximum
Large error (25℃,50%RH)
Minimum detection particle: 0.3 μm diameter
Power supply mode: ☐ DC 12V-24V
                   ☐ Other
Output form: ☐ RS485
             ☐ Other
Instrument cable length: ☐ Standard: 2.5 meters
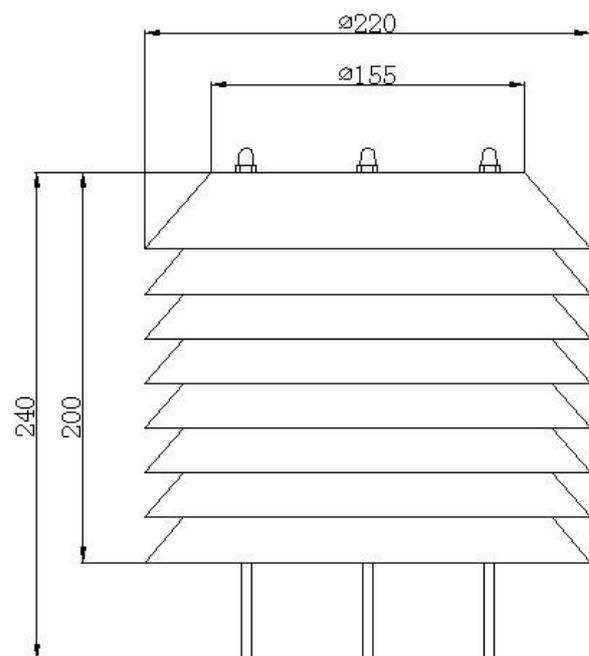   ☐Other
Ambient temperature: -20℃～+60℃
Operating environment humidity: 0～99%RH
Product power consumption: 350 mW

Connection method

1. If equipped with the collector produced by our company, directly use the sensor cable to

Dimensions

MODBUS-RTU Communication protocol

1. Agreement description:
Only when the customer purchases a separate sensor and uses RS485 signal output, the sensor will follow this protocol
2. Serial port format
Data bits 8 bits
stop bit 1 bit
Check Digit None

Baud rate 9600 The interval between two communications is at least 1000ms

3. Communication format

【1】Write the device address

Send: 00 10 Address CRC (5 bytes)

Returns: 00 10 CRC (4 bytes)

Instructions: 1. The address bit of the read/write address command must be 00.

2. Address is 1 byte and the range is 1-255.

For example: send 00 10 01 BD C0

return 00 10 00 7C

【2】 Read the device address

Send: 00 20 CRC (4 bytes)

Returns: 00 20 Address CRC (5 bytes)

Description: Address is 1 byte, the range is 1-255

For example: send 00 20 00 68

Return 00 20 01 A9 C0

【3】Read real-time data

Send: Address 03 00 00 00 02 CRC

Description: As shown in the figure below

Code	Functional Definition	Remark
Address	Station number (address)	
03	Function Code	
00　00	Start address	
00　02	Read points	
CRC	CRC Check code	low front and high back

Return：Address 03 04 XX XX YY YY CRC

Description: As shown in the figure below

| Code	Functional Definition	Remark
Address	Station number (address)	
03	Function Code	
04	Read unit bytes	
XX　XX	PM2.5 date	front high back low, hexadecimal
YY　YY	PM10 date	front high back low, hexadecimal
CRC	CRC check code	low front and high back

For example: send 01 03 00 00 00 02 C4 0B

Return: 01 03 04 00 B4 01 10 BA 49

Note: 00 B4 converted to hexadecimal is 180, after data analysis, the actual PM2.5 is 180 μg/m3, 01 10 converted to hexadecimal is 272, after data analysis, the actual PM2.5 is 272 μg/m3

Steps to calculate CRC code:

1. The preset 16-bit register is hexadecimal FFFF (that is, all 1s). Call this register the CRC register;

2. XOR the first 8-bit data with the lower bits of the 16-bit CRC register, and place the result in the CRC register;

3. Shift the contents of the register one bit to the right (toward the lower bit), fill the highest bit with 0, and check the shifted out bit after the right shift;

4. If the shift out bit is 0: repeat step 3 (shift right one bit again)

   If the shift-out bit is 1: XOR the CRC register with the polynomial A001 (1010 0000 0000 0001);

5. Repeat steps 3 and 4 until the right shift is performed 8 times, so that the entire 8-bit data is processed;

6. Repeat steps 2 to 5 to process the next 8-bit data;

7. The final CRC register is the CRC code;

8. When the CRC result is put into the information frame, the high and low bits are exchanged, and the low bits are first.

RS485 Circuit diagram
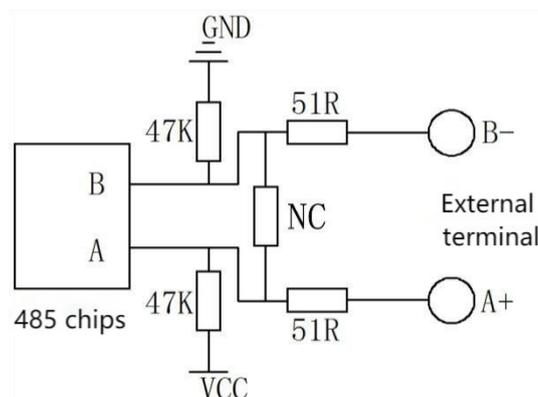
Instructions

Wire the sensor according to the instructions in the wiring method, then place the sensor probe at the position to be measured, turn on the power supply and the switch of the collector, and the dust at the measurement point can be obtained.

Installation method

1. It must be installed vertically;
2. Keep away from artificial airflow such as fans. For example, when it is used for air purifiers, the front and rear of the fan cannot be installed. It can be installed on one side of the casing, but the air vents should be reserved on the casing to ensure that the external airflow can flow in;
3. Pay attention to avoid sticky particles such as oil or catkins from entering the module during installation. When such particles stick to the optical components, failure will occur;
4. When the module is wet, its normal function will be affected, so it should be avoided.

Notice

1. Please check whether the packaging is in good condition, and check whether the product model is consistent with the selection;
2. Do not connect with live power. After the wiring is completed and checked, the power can be turned on;
3. The length of the sensor line will affect the output signal of the product. Do not arbitrarily change the components or wires that have been soldered when the product leaves the factory. If you need to change it, please contact the manufacturer;
4. The sensor is a precision device, please do not disassemble it by yourself, or touch the surface of the sensor with sharp objects or corrosive liquid, so as not to damage the product;
5. Please keep the verification certificate and qualification certificate, and return it together with the product during maintenance.

Trouble clearing

1. During analog output, the indicator indicates that the value is 0 or not within the range. The collector may not be able to obtain information correctly due to wiring problems. Please check whether the wiring is correct and firm, and whether the power supply voltage is normal;
2. If it is not for the above reasons, please contact the manufacturer.

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