

RS-PM-N01-2

Air quality

(PM2.5 / PM10)

Transmitter user's

Guide(485 type)



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1. Introduction

1.1 Product Overview

RS-PM-N01-2 Is an industrial transmitter universal particle concentration, measured using laser light scattering principle, the unique data acquisition technology dual sieved particles obtained number of particles per unit volume equivalent particle diameter, and a unique scientific the algorithm calculates the concentration of particulate matter per unit volume equivalent particle diameter, and is output via data interface 485 ModBus-RTU protocol. Can be used for monitoring the concentration of PM10 or PM2.5 need a place outdoor weather, dust monitoring, libraries, archives, and other industrial plants.

1.2 Features

Range: 0-1000ug/m³, resolution: 1ug/m³

PM2.5, PM10 simultaneous output

Unique dual automatic data acquisition and calibration techniques, consistency of up to $\pm 10\%$

The use of advanced laser anti-attenuation technology to ensure long-term stability of equipment

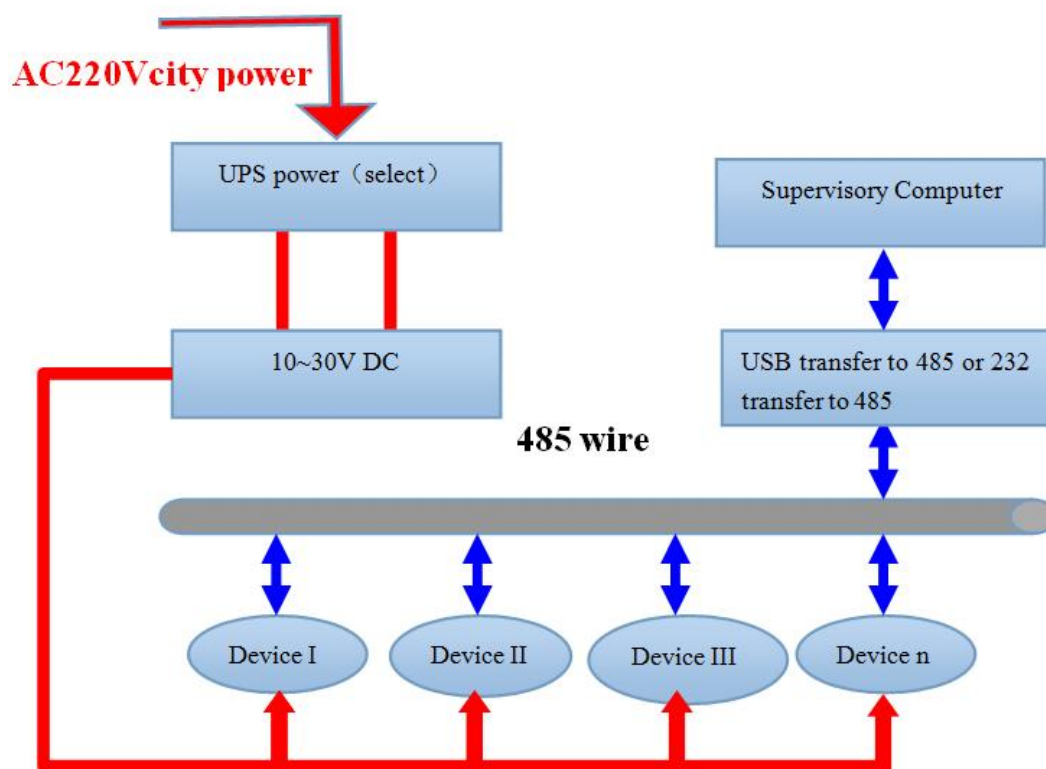
ModBus-RTU standard communication protocol, easy access,

1.3 Main Specifications

DC power supply (default)	10~30V DC
power waste	0.5W
Working temperature and humidity of transmitter circuit	-20℃~+60℃, 0%RH~95%RH Non dewing
communication interface	485 communication (modbus) protocol Baud rate: 2400, 4800 (default), 9600 Data bit length: 8 bits

	Parity check mode: None Stop bit length: 1 bit Default ModBus communication address: 1	
Parameter setting	Use the provided configuration software to configure through the 485 interface	
resolving power	PM2.5/PM10/P M1.0	1ug/m3
	temperature	0.1℃
	humidity	0.1%RH
accuracy	PM2.5	Particle counting efficiency: 50%@0.3um, 98%@≥0.5um。 ±10ug/m3@0~100ug/m3
	A Accuracy	humidity: ±2%RH(60%RH,25℃)
		temperature: ±0.4℃ (25℃)
	B Accuracy (Default)	humidity: ±3%RH(60%RH,25℃)
		temperature: ±0.5℃ (25℃)
measuring range	PM2.5	0~1000ug/m3
	PM10	0~1000ug/m3
	PM1.0	0~1000ug/m3
	temperature	-40~+80℃
	humidity	0%RH-100%RH
response speed	≤90S	
Warm up time	≤2min	
Installation method	Wall mounted	

1.4 FIG framework



System scheme block diagram

2. Installation instructions

2.1 Equipment installation check

Equipment List:

- transmitter equipment 1
- certificate, warranty card, service card, etc.
- 12V / 2A 1 water supply station (optional)
- USB to 485 (optional)
- 485 terminating resistor (optional)

2.2 Interface Description

Wide voltage power input 10 ~ 30 V can. Note that the signal line 485 when the terminal A \ B two lines can not be reversed, the address bus between multiple devices must not conflict.

2.3 electrical wiring

	Line color	Description
Electricity source	brown	A positive power supply (10 ~ 30 V DC)
	black	Negative power supply
through letter	yellow	485 -A
	blue	485 -B

2.4 Description field wiring

When a plurality of types of devices 485 connected to the same bus, the field wiring have certain requirements, refer to the specific data packet "485 field wiring device manual."

3. Configure the software installation and use

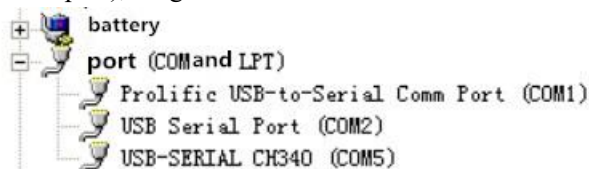
3.1 Software Selection

Opening the datagram, and choosing "test software" ---- "485 parameter setting software"

and finding out  and opening it.

3.2 parameter settings

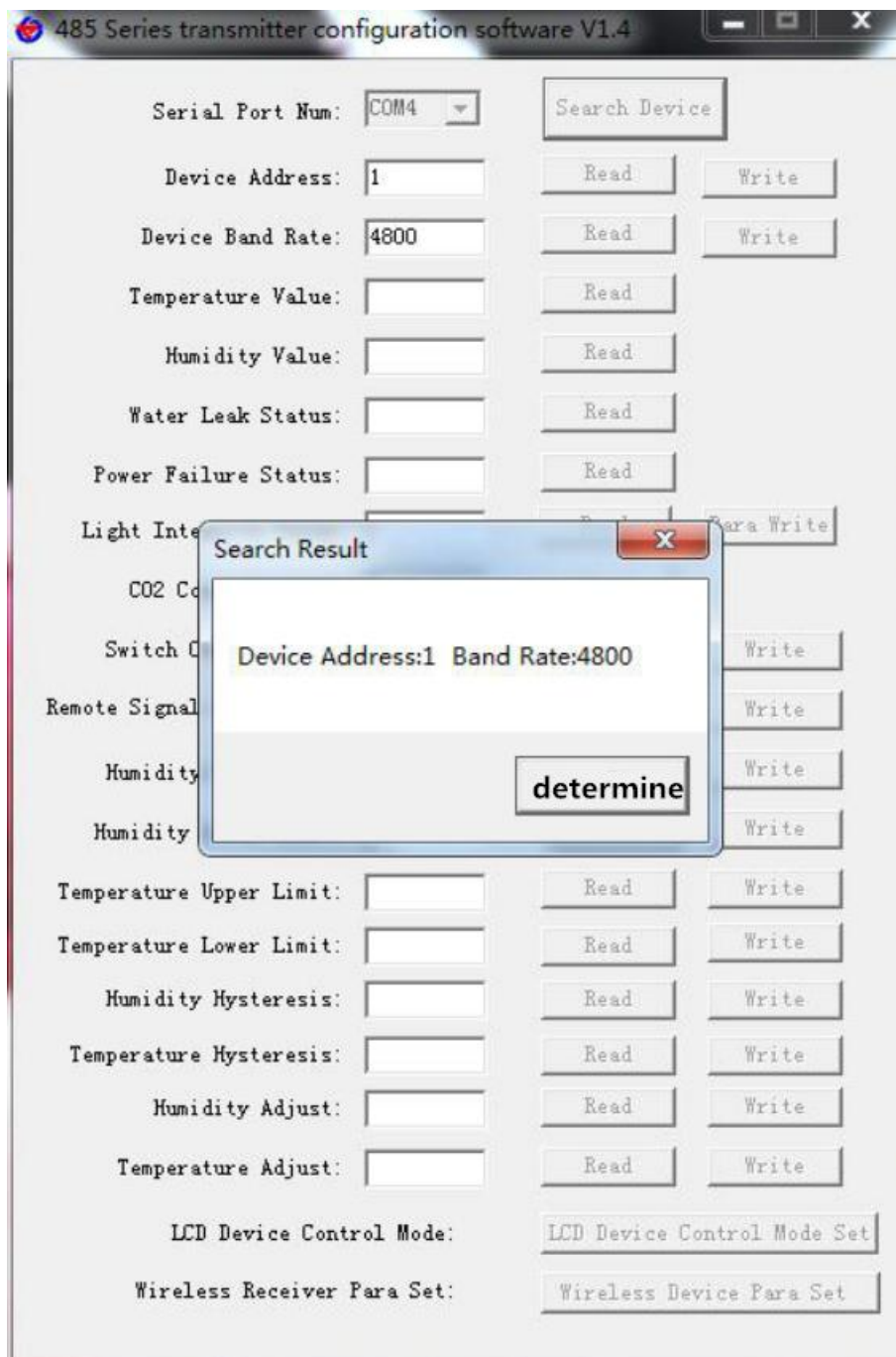
①, select the correct COM port ("My Computer - Properties - Device Manager - Port" inside view COM port), a figure below lists several different names drive 485 converter.



②, just take a single piece of equipment and power-up, click on the software testing baud rate, the software will test the current baud rate and device address, the default baud rate is 4800bit / s, the default address is 0x01.

③, the address needs to be modified according to the use and the baud rate, and can query the current state devices.

④, if the test is unsuccessful, recheck the wiring and equipment 485 driver installation.



4. Communication Protocol

4.1 The basic parameters of Communications

Ed code	8-bit binary
Data bits	8

Parity bit	no
Stop bit	1
Error checking	CRC (cyclic redundancy code)
Baud rate	2400bit / s, 4800bit / s, 9600 bit / s can be set, the default setting is 48 00bit / s

4.2 Frame format definition data

Using Modbus - RTU communication protocol, in the following format:

Initial structure ≥ 4 byte time

address code = 1 byte

function code = 1 byte

Data area = N bytes

Error checking = 16-bit CRC

End structure ≥ 4 byte time

Address code: for the address of the transmitter, the communication network is the only (factory default 0x01).

Function Code: The host command functions such as directions, the transmitter has used only the function code 0x03 (read data register).

Data area: data area is the specific communication data, note data of 16bits endian!

CRC code: two-byte checksum.

Host query frame structure:

address code	function code	Register start address	Register length	Check code low	Check code high
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Slave Answer Frame Structure:

address code	function code	Valid bytes	Data area	The second data area	The first data region N	Check code
1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes	2 bytes

4.3 Register Address

When the equipment is PM2.5/PM10 element

Register address	PLC or configuration address	content	operation
0000 H	40001	PM2.5 The uploaded data is the real value	read-only
0001 H	40002	PM10 The uploaded data is the	read-only

		real value	
0002H	40003	PM1.0 The uploaded data is the real value	read-only

When the equipment is multi element

Register address	PLC or configuration address	content	operation
0000 H	40001	Humidity (10 times the actual value)	read-only
0001 H	40002	Temperature (10 times the actual value)	read-only
0002H	40003	PM2.5 (true value)	read-only
0003H	40004	PM10 (true value)	read-only
0004H	40005	PM1.0 (true value)	read-only

4.4 protocol examples and explanation

Example: address reading device PM values of 0x01

Inquiry frame:

address code	function code	Start address	Data length	Check code low	Check code high
0x 01	0x0 3	0x00 0x00	0x00 0x0 2	0x C4	0x 0B

Answer frame: (E.g., read PM2.5 of 85 ug / m3, PM10 was 156 ug / m3)

address code	function code	Returns the number of valid bytes	PM2.5 values	PM10 value	Check code low	Check code high
0x 01	0x0 3	0x0 4 55	0x0 0 0x	0x 00 0x 9C	0x EA	0x 4A

Temperature calculation:

When the temperature is lower than 0 °C, the temperature data is uploaded in the form of complement.

Temperature: FF9B H (hex)=- 101=>Temperature=- 10.1 °C

Humidity calculation:

Humidity: 292 H (hex)=658=>Humidity=65.8% RH

(2) Example: Read the PM value of device address 0x01

Interrogation frame (hexadecimal):

Address code	Function code	Start Address	Data length	Check code low bit	Check code high
0x01	0x03	0x00 0x02	0x00 0x03	0xA4	0x0B

Answer frame (hexadecimal): (for example, the PM2.5 read is 101ug/m³, PM10 is 121ug/m³)

Address code	Function code	Return the number of valid bytes	PM2.5 value	PM10 value	PM1.0 value	Check code low bit	Check code high
0x01	0x03	0x04	0x00 0x065	0x00 0x79	0x00 0x52	0x2B	0xCE

PM2.5 calculation:

PM2.5:0065 H (hex)=101=>PM2.5=101ug/m³

PM10 calculation:

PM10: 0079H (hex)=121=>PM10=121ug/m³

PM1.0 calculation:

PM1.0:0052H (hex)=80=>PM1.0=80ug/m³

If the equipment is a PM element

Example: Read the PM value of device address 0x01

Interrogation frame:

Address code	Function code	Start Address	Data length	Check code low bit	Check code high
0x01	0x03	0x00 0x00	0x00 0x03	0x05	0xCB

Answer frame: (for example, read PM2.5 is 85ug/m³, PM10 is 156ug/m³)

Address code	Function code	Return the number of valid bytes	PM2.5 value	PM10 value	PM1.0 value	Check code low bit	Check code high
0x01	0x03	0x04	0x00 0x55	0x00 0x9C	0x00 0x4A	0xEA	0x4A

PM2.5 calculation:

PM2.5:0055 H (hex)=85=>PM2.5=85ug/m³

PM10 calculation:

PM10:009CH (hex)=156=>PM10=156ug/m³

PM1.0 calculation:

PM1.0:009CH (hex)=74=>PM1.0=74ug/m³

5. Common Problems and Solutions

5.1 device can not connect to a PLC or PC

possible reason:

- 1) computer has multiple COM ports, port selection is not correct.
- 2) device address error, or there is a duplicate device address (factory default all 1).
- 3) The baud rate, parity, data bits, stop bits error.
- 4) The master polling interval and response wait time is too short, it is required more than 200ms provided.
- 5) 485 has turned off, or A, B line reversed.
- 6) the number of devices or the wiring too long, to be near the power supply, plus booster 485, while increasing 120 Ω termination resistor.
- 7) USB drive switch 485 is not installed or damaged.
- 8) equipment damage.

6. Contact

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Web QR:



7.Document History

8. size housing

Overall dimensions: 110 × 85 × 44mm

