SO2 transmitter
SO2 temperature and humidity integration Transmitter instruction manual (Type 485)

Document version：V1.0


二氧化硫变送器
Sulfur dioxide(SO_2) Transmitter
建大仁科


二氧化硫温湿度变送器
SO_2 Temperature & Humidity Transmitter
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1. product description

1.1 product description

With the development of China's economy, energy consumption is increasing, and SO2 pollution is becoming more and more serious. SO2 is an important cause of acid rain in the atmosphere. It is extremely harmful to the environment and the human body. SO2 is inhaled into the human body and forms acidic substances to stimulate the human body. Related organizations.

The transmitter uses electrochemical technology to measure SO2 concentration, and the reaction is rapid and sensitive. The transmitter is widely used in air quality testing and other occasions where SO2 and temperature and humidity testing are required. Using 485 communication, standard ModBus-RTU communication protocol, communication address and baud rate can be set, the farthest communication distance is 2000 meters. The equipment is 10-30V wide-voltage power supply, and the enclosure has a high degree of protection, which can adapt to various harsh conditions on site.

1.2 Features

■ It adopts high-sensitivity gas detection probe imported from the United States, has mature technology, and uses high-performance signal acquisition circuit to accurately measure SO2 concentration, with stable signal and high accuracy.

■The measurement range is 0-20.00ppm (default).

■485 communication, standard ModBus-RTU communication protocol, communication address and baud rate can be set, the farthest communication distance is 2000 meters.

■ The product adopts a wall-mounted waterproof shell, which is easy to install and has a high degree of protection.

1.3 Main Specifications

Power supply：10~30V DC　　Average power consumption：0.18W

Temperature measurement range：-40℃~80℃　　Temperature accuracy：±0.5℃

Humidity measurement range：0~100%RH　　Humidity accuracy：±5%RH

SO2 measurement range：0~20.00ppm（default）　　SO2 Resolution：0.01ppm

SO2 Accuracy: ±5%FS or 10%

Operating temperature：-20℃~+50℃　　Working humidity：15%RH~90%RH

Data update time：2s　　stability：<10%

Response time：90% step change is generally less than 50S　Output signal: 485

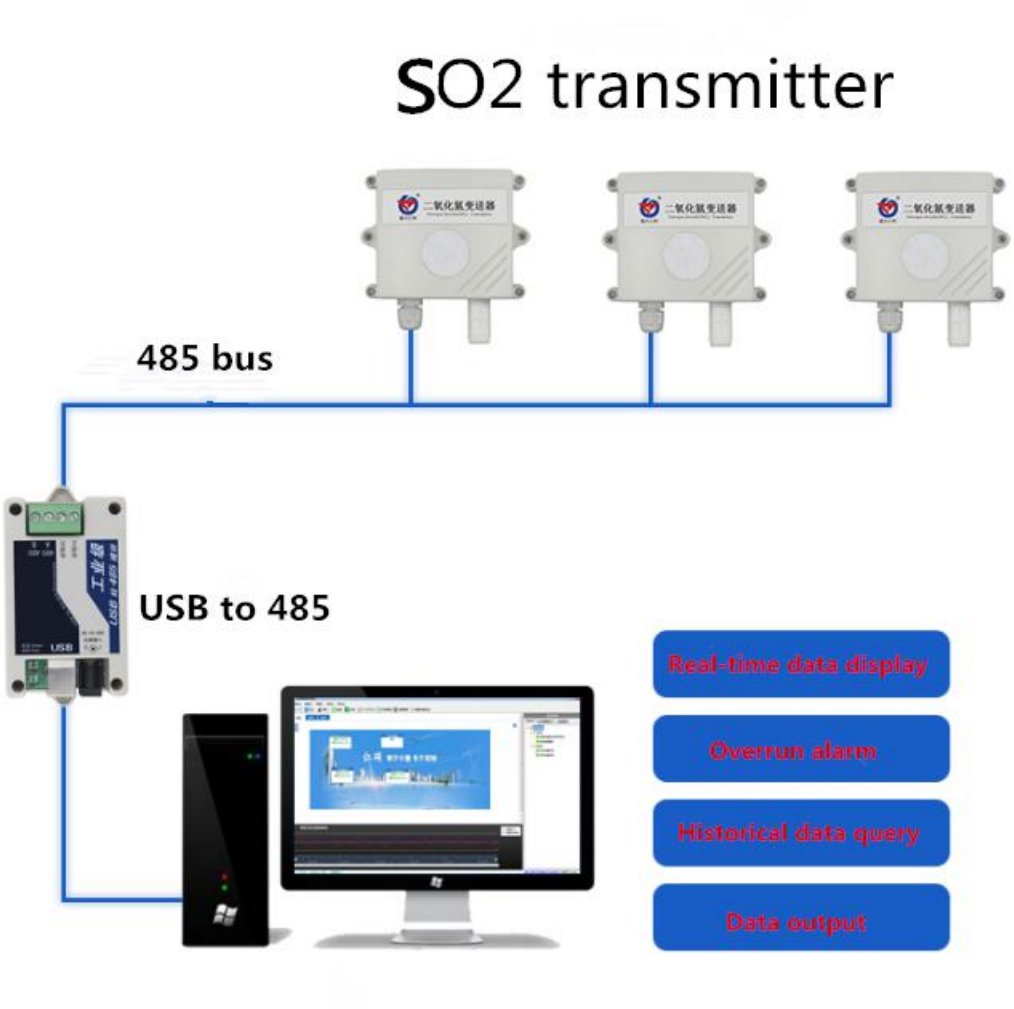
Detection accuracy：<20ppb

1.4product model

RS-			Company code
	SO2-		SO2 concentration

					transmission sensor
	SO2WS-				SO2 concentration temperature and humidity three-in-one transmission sensor
		N01-			RS485 (M0dbus protocol)
			2-		Wall-mounted king shell
				4	External waterproof probe

1.5System framework



System solution block diagram

2. Equipment installation instructions

2.1 Equipment inspection before installation

Equipment List：

■1 set of SO2 transmitter equipment

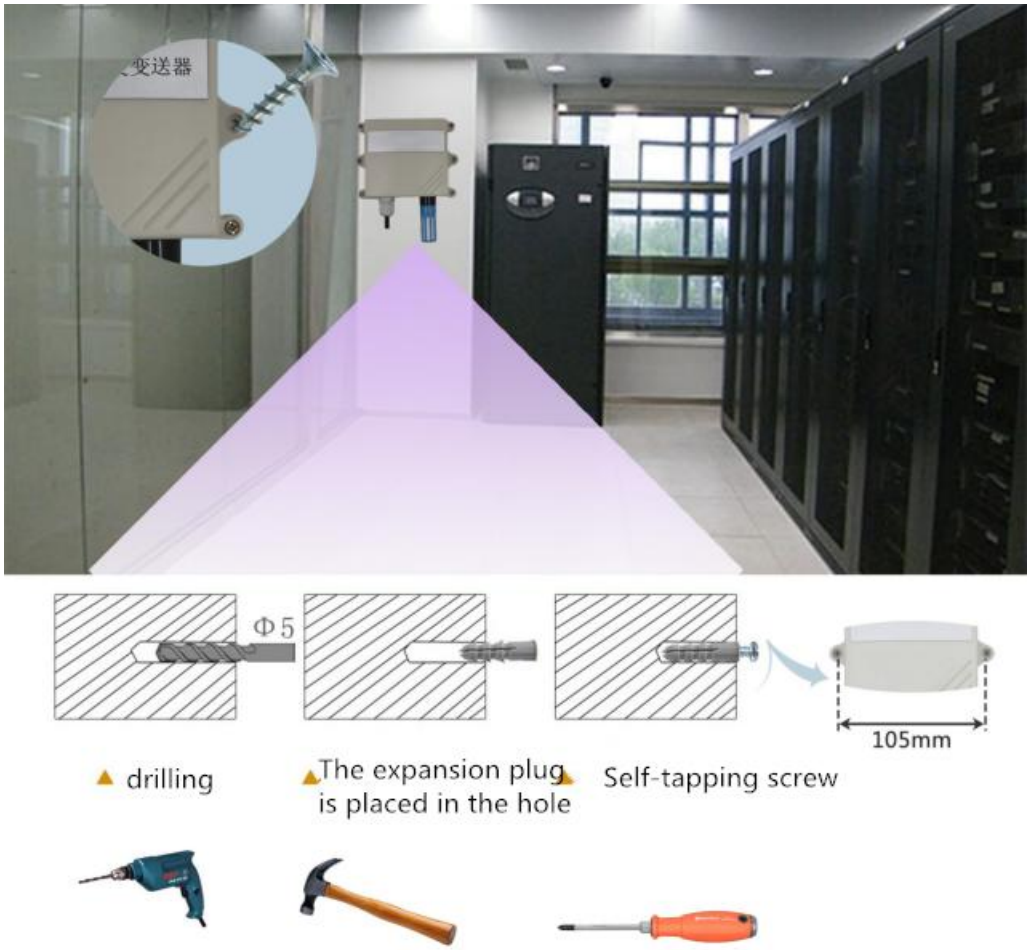
■Self-tapping screws (2), expansion plugs (2)

■Product certificate, warranty card, wiring instructions, etc.

■12V/1A waterproof power supply 1 (optional)

■USB to 485 (optional)

2.2 Installation step description



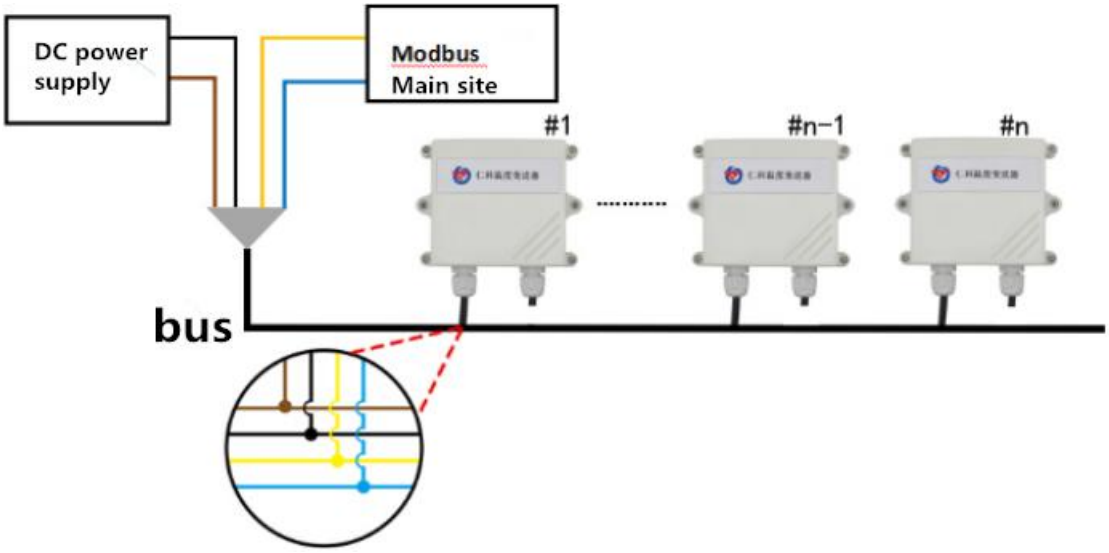
2.3 Interface Description

Wide voltage power input can be 10~30V. When wiring the 485 signal line, note that the A\B lines cannot be connected in reverse, and the addresses between multiple devices on the bus cannot conflict.。

	Line color	Description
power supply	brown	Power supply (10~30V DC)
	black	Negative power supply
Communication	yellow	485-A
	blue	485-B

2.4 485 field wiring instructions

When multiple 485 models are connected to the same bus, there are certain requirements for field wiring. For details, please refer to the 485 Equipment Field Wiring Manual in the data package.。

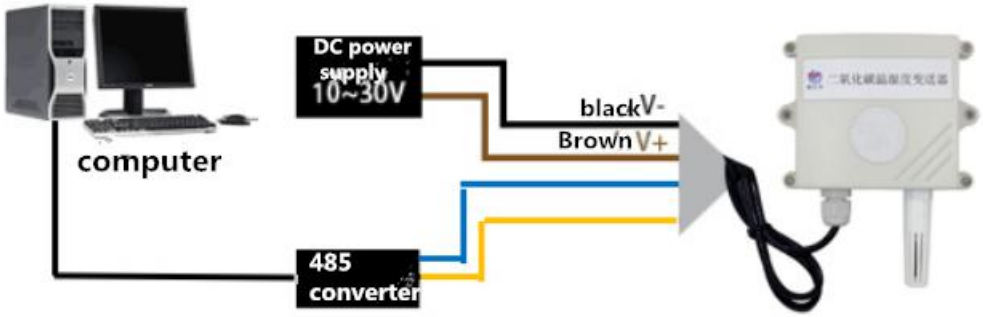


3. Configuration software installation and use

3.1 Software selection

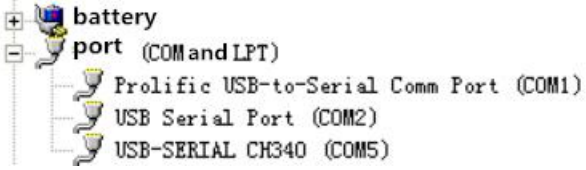
Open the package and select "Debug Software"---"485 Parameter Configuration Software" to find

Open it。



3.2parameter settings

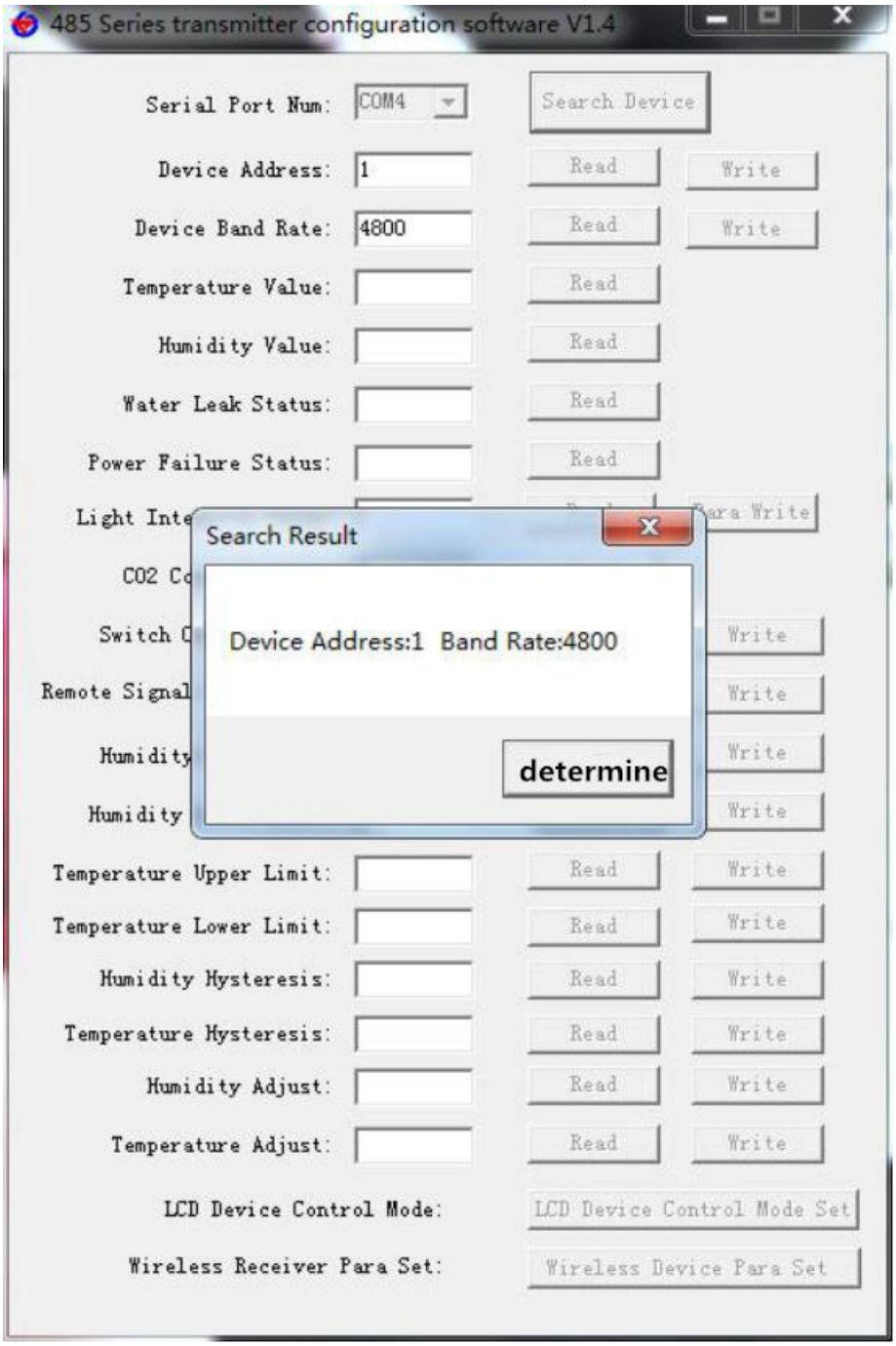
1. Select the correct COM port ("My Computer - Properties - Device Manager - Port" to view the COM port). The following figure lists the drive names of several different 485 converters.



2. Connect only one device and power on separately. Click the test baud rate of the software. The software will test the baud rate and address of the current device. The default baud rate is 4800 bit/s and the default address is 0x01.

3. Modify the address and baud rate according to the needs of use, and query the current functional status of the device.

4. If the test is not successful, please re-check the equipment wiring and 485 driver installation.



4. letter of agreement

4.1 Basic communication parameters

Code	8-bit binary
Data bit	8 digits
Parity bit	no
Stop bit	1 person
Error check	CRC (redundant cyclic code)

Baud rate	2400bit/s, 4800bit/s, 9600 bit/s can be set, the factory default is 4800bit/s

4.2 Data frame format definition

Adopt Modbus-RTU communication protocol, the format is as follows:

Initial structure ≥ 4 bytes of time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

End structure ≥ 4 bytes of time

Address code: is the address of the transmitter, which is unique in the communication network (factory default 0x01).

Function code: The instruction function of the command sent by the host. This transmitter only uses function code 0x03 (read register data).

Data area: The data area is the specific communication data. Note that the 16-bit data high byte is in front!

CRC code: Two-byte check code.

Host inquiry frame structure:

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

Slave response frame structure:

address code	function code	Effective number of bytes	Data area	Second data area	Nth data area	Check code
1 byte	1 byte	1 byte	2 byte	2 byte	2 byte	2 byte

4.3 Register address

Register address	PLC or configuration address	content	operating	Scope and definition	Actual value
0000 H	40001	Humidity value	Read only	0~1000	0~100.0
0001 H	40002	Temperature value	Read only	-400~800	-40.0~80.0

0002 H	40003	SO2 concentration value	Read only	0~2000	0~20.00

4.4 Communication protocol example and explanation

4.4.1 Read the SO2 value of device address 0x01

Inquiry frame

address code	function code	initial address	Data length	Check code low	Check code high
0x01	0x03	0x00 0x02	0x00 0x01	0x25	0xCA

Response frame (for example, reading 5.0ppm to SO2)

address code	function code	Returns the number of valid bytes	SO2 value	Check code low	Check code high
0x01	0x03	0x02	0x01 0xF4	0xB8	0x53

SO2：

1F4 H (hexadecimal) =500 => SO2=5.00 ppm

4.4.2 Read the temperature and humidity and SO2 value of device address 0x01

Inquiry frame

address code	function code	initial address	Data length	Check code low	Check code high
0x01	0x03	0x00 0x00	0x00 0x03	0x05	0xCB

Response frame (for example, reading temperature value -7.5 ° C humidity value 35.9% SO2 value 5.0 ppm)

address code	function code	Number of bytes	Humidity value	Temperature value	SO2 value	Check code low	Check code high
0x01	0x03	0x06	0x01 0x67	0xFF 0xB5	0x01 0xF4	0x34	0x89

Temperature: When the temperature is below 0 ° C, the temperature is uploaded in complement form.

FFB5 H (hex) = -75 => temperature = -7.5° C

humidity:

167 H (hexadecimal) = 359 => humidity = 35.9% RH

SO2:

1F4 H (hexadecimal) =500 => SO2=5.00 ppm

4.5 SO2 measurement unit ppm and ug/m3 conversion relationship

At standard atmospheric pressure, the conversion is based on the following conversion formula,

which is only applicable to the calculation of SO2:

1ppm =64/22.4=2.85mg/m3=2850ug/m3

1ppb =64/22.4=2.85ug/m3

5.Common problems and solutions

Device cannot connect to PLC or computer

possible reason：

1) The computer has multiple COM ports, and the selected port is incorrect.

2) The device address is incorrect, or there is a device with a duplicate address (all the factory defaults to 1).

3) Baud rate, check mode, data bit, stop bit error.

4) The host polling interval and the waiting response time are too short and need to be set to more than 200ms.

5) The 485 bus is disconnected, or the A and B lines are reversed.

6) If the number of devices is too large or the wiring is too long, the power should be supplied nearby, add 485 enhancer, and increase the resistance of 120Ω terminal.

7) The USB to 485 driver is not installed or damaged.

8) Equipment damage.

6. Contact information

Shandong Renke Control Technology Co., Ltd.

Address: 2 / F, East Block, Building 8, Shun Tai Plaza, High-tech Zone, Jinan City, Shandong Province

Post code: 250101

Phone: 400-085-5807

Website: www.renkeer.com

Cloud platform address: en.0531yun.cn Or: eniot.0531yun.cn

Web QR:

7. Document history

The V1.0 documentation was created.

8. Appendix: Housing dimensions

Overall size: 110 × 85 × 44mm


44mm
85mm
110mm