

# **RS-TVOC-N01**

# **Wall-mounted TVOC**

# **Transmitter User**

# **Manual**

# **(Type 485)**

Document version: V1.1



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# 1. product description

## 1.1 product description

With the development of the home construction industry, indoor environmental pollution caused by interior decoration has also received more and more attention. TVOC is the most serious impact of three organic pollutants (poly cyclic aromatic hydrocarbons, volatile organic compounds and aldehydes) in the air. One. VOC refers to an organic substance with a saturated vapor pressure exceeding 133.32pa at room temperature. Its boiling point is from 50 ° C to 250 ° C. It can be evaporated in the form of air at normal temperature. It is toxic, irritating, carcinogenic and special odor. It will affect the skin and mucous membranes and cause great damage to the human body. The RS-TVOC-N01 transmitter introduced by our company can effectively monitor the TVOC content in the environment. The product adopts 485 communication interface and marks the ModBus-RTU communication protocol, which can communicate directly with PLC, user host and configuration software. Convenient for secondary development.

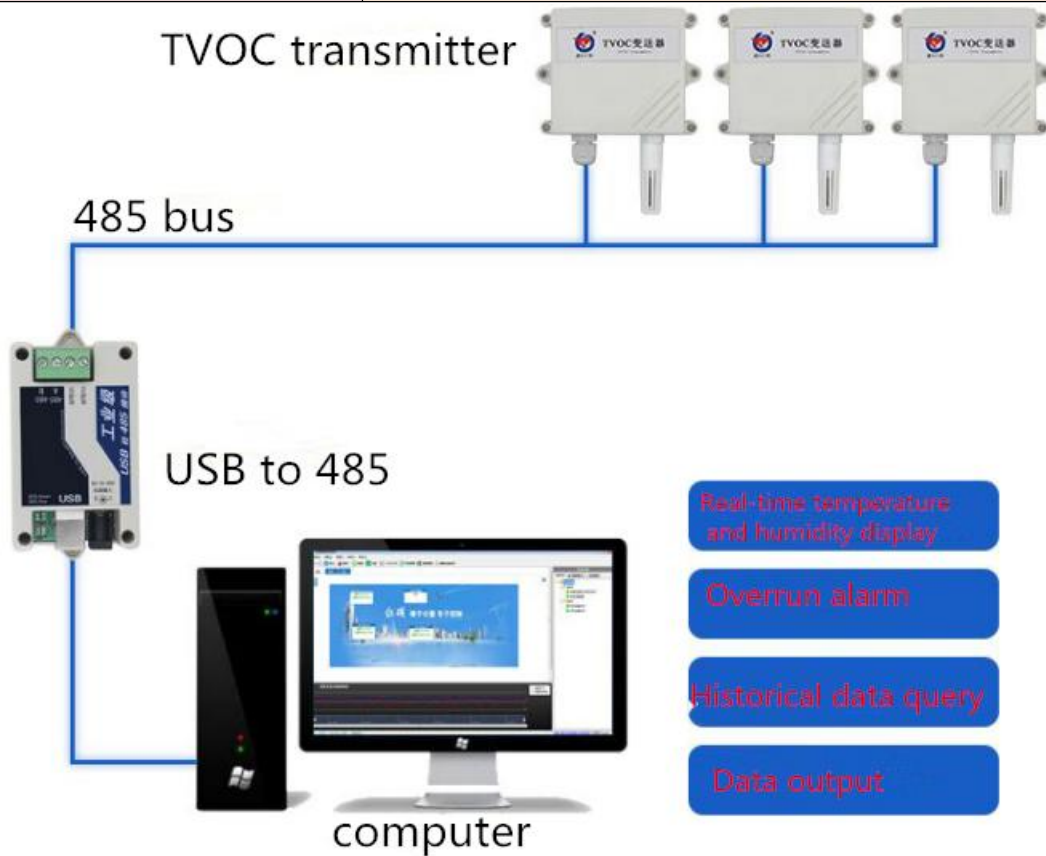
## 1.2 Features

- The imported high-sensitivity gas detection probe is mature in technology and uses high-performance signal acquisition circuit for stable signal and high accuracy.
- TVOC measurement range 0~60000ppb。
- 485 communication, standard ModBus-RTU communication protocol, communication address and baud rate can be set, the farthest communication distance can reach 2000 meters.
- The product adopts a wall-mounted waterproof shell, which is easy to install and has a high degree of protection.

### 1.3 The main technical parameters

#### 1.4 application solution

DC power supply (default)	DC 10-30V
Maximum power consumption	0.5W
working environment	-40℃~+85℃, 0%RH~95%RH
TVOC measurement range	0~60000ppb
Measuring object	Volatile organic compounds
TVOC display resolution	1ppb
Data refresh time	1s
TVOC measurement accuracy	Typical accuracy $\pm 8\%FS(@C_2H_6O, 0.5ppm, 25^\circ C, 50\%RH)$ , used for measure variation trend of TVOC, measurement value as a reference )
output signal	RS485(Modbusprotocol)
Installation method	Wall mounting



System solution block diagram

## 1.5 product model

RS-				Company code	
	TVOC-			TVOC transmission sensor	
		N01		485 communication (Modbus-RTU protocol)	
			-2	Wall-mounted king shell	
				-4	Built-in hardcover probe

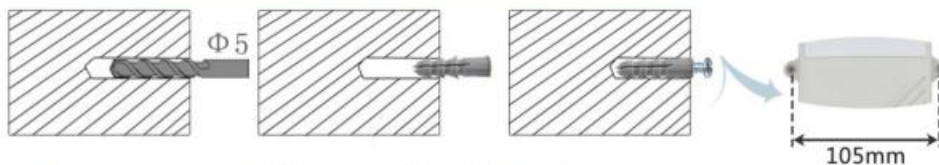
## 2. Equipment installation instructions

### 2.1 Equipment inspection before installation

#### Equipment List:

- TVOC transmitter equipment 1
- 12V/1A waterproof power supply 1 (optional)
- Certificate, warranty card, calibration report, etc.
- 2 expansion plugs, 2 self-tapping screws
- USB to 485 (optional)
- 485 terminal resistance (given by multiple devices)

## 2.2 Installation method



▲ drilling

▲ The expansion plug is placed in the hole

Self-tapping screw



Special Note:

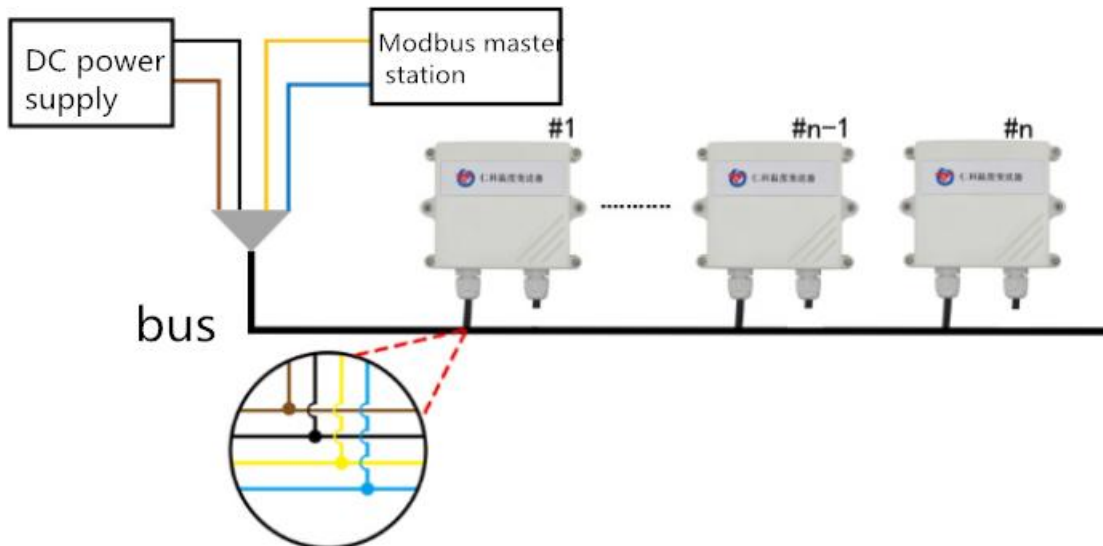
- 1) There are certain specifications for 485 line field wiring. For details, please refer to the data package "485 Equipment Field Wiring Manual".
- 2) When the device is connected to the 485 bus, ensure that the addresses of multiple devices are not duplicated.

## 2.3 wiring instructions

### Power supply and 485 signal

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.

## 2.4 Specific wiring



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

## 3. Configuration software installation and use

### 3.1 Software selection

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



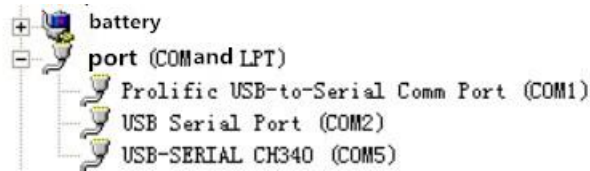
find... Open it.

**Note: Only one device can be connected when changing the address and baud rate using this configuration software.**

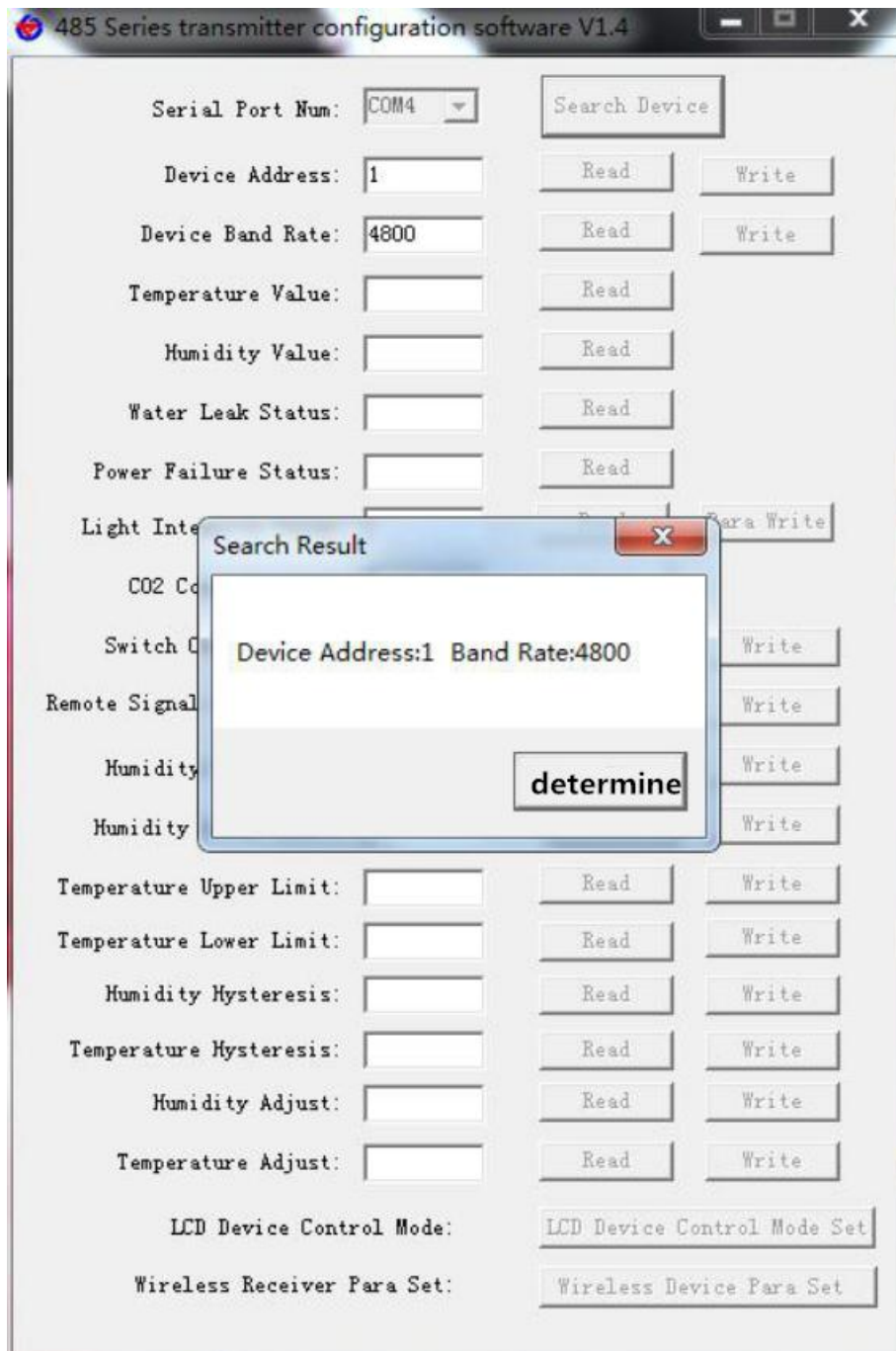
### 3.2 parameter settings

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  $\geq$  4 bytes of time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

End structure  $\geq$  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 bytes	2 bytes	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 bytes	2 bytes	2 bytes	2 bytes

### 4.3 Register address

Register address	PLC or configuration	content	operating
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	address		
0000 H	40001	TVOC value (ppb)	Read only

#### 4.4 Communication protocol example and explanation

**Example: Read the TVOC value of device address 0x01**

**Inquiry frame (hexadecimal):**

address code	function code	starting address	Data length	Check code low	Check code high
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

Response frame (hexadecimal): (for example, read TVOC value is 658ppb)

address code	function code	Returns the number of valid bytes	TVOC value	Check code low	Check code high
0x01	0x03	0x02	0x02 0x92	0x38	0x89

**TVOC value calculation:**

**TVOC value:** 292 H (hex) = 658 => TVOC = 658ppb

### 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 duplicate addresses (factory default is 1)
- 3) Baud rate, check mode, data bit, stop bit error
- 4) The 485 bus is disconnected, or the A and B lines are reversed.
- 5) 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 120  $\Omega$  terminal.
- 6) USB to 485 driver is not installed or damaged
- 7) 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](http://www.renkeer.com)

Cloud platform address: [en.0531yun.cn](http://en.0531yun.cn) Or: [eniot.0531yun.cn](http://eniot.0531yun.cn)

Web QR:



APP QR:



Android

## 7. Document history

V1.0 document creation

V1.1 Modify product selection

