

# Gas sensors Instruction manual



**Changsha Zoko Link Technology Co., Ltd.**

## 1.Product Description

The gas sensor produced by our company is a high-precision sensor specially used for environmental gas detection, the sensor adopts the common electrochemical detection principle in the industry, which can accurately and efficiently detect the content of TVOC, H2S and gas in the air, with good stability and anti-interference ability, high measurement accuracy, stable performance, long service life, no need to repeat the calibration, and a wide range of applications.

## 2.Functional features

- ◆High sensitivity, high resolution, low power consumption.
- ◆Elaborate circuit design, fast response time, signal output diversity

### Various installation methods

- ◆Strong stability, low error rate
- ◆ Strong anti-interference, long service life
- ◆ Simple structure design, comfortable, make the maintenance more simple

## 3.Scope of application

Widely used in the monitoring of urban atmospheric environment, monitoring of disorganised emission of pollutant gases in factories, environmental control systems, greenhouses, artificial climate chambers, indoor air purification systems, mechanical automation workshops, warehouses, machine rooms, large and medium-sized public places, intelligent buildings, homes, building automation and other places and indoor environmental gas detection.

#### 4. Technical indicators

Detection principle:	Electrochemical
Supply voltage:	12-24VDC
Signal output:	RS 485
RS485 type:	MODBUS-RTU (conventional)
TVOC range:	0-40ppm
H2S range:	0-10ppm
Flammable Gas range:	0-10000ppm
Measurement accuracy:	$\leq \pm 3\%$
Equipment power consumption:	$\leq 50\text{mA}$
Response time:	$\leq 30\text{S}$ (T90)
Operating Temperature:	$-20^{\circ}\text{C} \sim +50$
Working humidity:	$\leq 95\% \text{RH}$ without condensation
Protection grade:	IP65
Probe line length:	10 metres, can be customised

##### 1. Line connection (485 signal)

- a) Red line - power line (12-24VDC)
- b) Black wire - ground (GND)
- c) Yellow wire-485A
- d) Blue wire-485B

After completing the wiring, it should be carefully checked to avoid incorrect connection before power on.

##### 2. Communication Protocol

###### Serial Port Format

Data bit 8 bits

Stop bit 1 or 2 bits

Check digit None

Baud rate 9600 At least 1000ms between communications

Communication format

[1] Write device address

Send: 00 10 Adress CRC (5 bytes)

Return: 00 10 CRC (4 bytes)

Explanation: 1. The address bit of the read/write address command must be 00. 2.

2. Adress is 1 byte, the range is 0-255.

Example: Send 00 10 01 BD C0

Return 00 10 00 7C

[2] Read device address

Send: 00 20 CRC (4 bytes)

Return: 00 20 Adress CRC (5 bytes)

Explanation: Adress is 1 byte, the range is 0-255.

Example: Send 00 20 00 68

Return: 00 20 01 A9 C0

[3] Read real-time data

Send: Address 03 00 00 00 00 04 XX XX

For example: address is 01, then read data command is 01 03 00 00 00 00 04 44 09

Send: 01 03 00 00 00 00 03 44 09

Description: as shown in the figure below

Coding	Function Definition	Remarks
Adress	Station number (address)	
03	Function Code	
00 00	Starting address	
00 01	Read Points	
XX XX	CRC check code, front low and back high	

Return: Address 03 08 RR RR RR RR RR RR RR RR XX XX

For example, if the address is 01, the possible return data is

Return: 01 03 08 00 19 1F 40 00 0A 00 01 FF 74

The register sequence is: TVOC. H2S. gasable.

Description: as shown below

Coding	Function Definition	Remarks
Adress	Station number (address)	
03	Function code	
02	Read unit byte	
RR RR	Data (front high, back low)	hexadecimal
XX XX	CRC check code	

Then 00 02 is the returned ammonia data, convert hexadecimal to decimal and multiply by 1 for the final data 2ppm

Steps to calculate the CRC code:

1, preset the 16-bit register to hex FFFF (i.e., all 1s). Call this register the CRC register;

2, put the first 8-bit data with the low bit of the 16-bit CRC register is different or, put the result in the CRC register;

3, shift the contents of the register one bit to the right (towards the low bit), fill the highest bit with 0, and check the lowest bit;

4, if the lowest bit is 0: repeat step 3 (shift again)

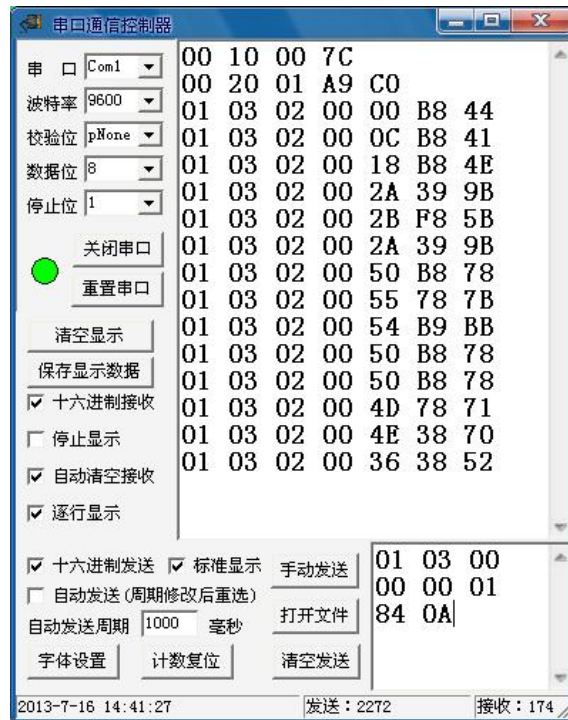
If the lowest bit is 1: the CRC register is iso-orthogonal to the polynomial A001 (1010 0000 0000 0001);

5. Repeat steps 3 and 4 until it is shifted right 8 times so that the entire 8-bit data is all processed;

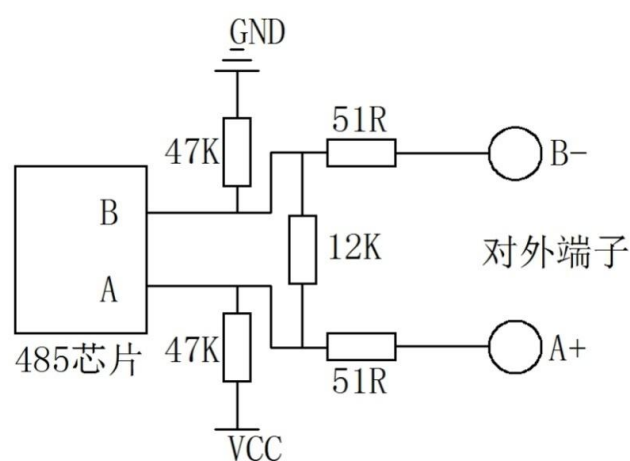
6, repeating steps 2 to 5 for the next 8-bit data processing;

7, the final CRC register obtained is the CRC code;

8、 When putting the CRC result into the information frame, the high and low bits will be exchanged, with the low bit coming first.



## RS485



## 1. Sensor detection and maintenance

(1) When the sensor is found to be abnormal, check whether the line is normal, whether the wiring is correct, whether the power supply is powered.

(2) If the sensor is connected to the host above, check the wiring, the value if the display 32767 (host shows the bar), it shows that the sensor is not connected, then the sensor can be unplugged from the computer serial port alone, in accordance with the instructions in the wiring and communication protocols to read the value of a separate, if the value of the readings for the 7F FF, indicating that the sensor is faulty, if the value of the normal, then the host failure.

(3) In the event that you can not deal with the situation, please contact the manufacturer after-sales service, return to the factory for maintenance, do not disassemble the equipment.

### Contact Us

Pre-sales consultation: +8618073152920

After-sales service: +8615367865107

Postcode: 421000

Email: [sales@niubol.com](mailto:sales@niubol.com)

Website: <http://www.niubol.com>

Address: Room 103, Zone D, Houhu Industrial Park, Yuelu District, Changsha City, Hunan Province, China