Infrared Nitric Oxide Module Sensor Manual

JX-NO-101

Ver1.0

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Chapter 1 Product Introduction

1.1 Product overview

JX-NO-101 series is a kind of sensor that uses non-dispersive infrared technology (NDIR) to measure nitric oxide. It is a pump-suction sensor.

1.2 Product features

(1) Imported infrared light source and dual-channel pyroelectric sensor

(2) Multi-point calibration, good linear range within the measuring range

(3) Built-in temperature sensor and temperature compensation

(4) Good digital signal processing

(5) RS485, URAT, 0-5V/0-10V/4-20ma multiple signal output modes are optional

(6) The range and accuracy level can be customized according to requirements

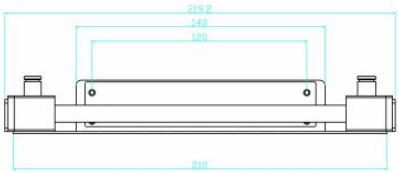
1.3Product Parameters

parameter	Technical index
Measuring range	0-10000ppm（default）
Measurement resolution	1ppm
Measurement accuracy	±3%F.S(25℃)
Zero drift	< 0.5%F.S(25℃)
Response time	< 60s (25℃)

Minimum warm-up	< 3min (25℃)
Reach accuracy	< 8min (25℃)
Communication method	RS485,URAT,0-5V or 0-10V
Operating Voltage	9-24V DC
Average power consumption	<60mA
Working humidity	0~95%RH(Non-condensing)
Operating temperature	-10~60 ℃， Maximum temperature resistance 85 ℃ ; temperature compensation range: 0~50 ℃ , factory default
storage temperature	-20~70℃
Infrared band of light source	0-5 μ m

1.2 Product Appearance

The following figure is the appearance and structure size of the product, as well as the installation hole position, as shown in thefigure:



Chapter2 Data Protocol

2.1 Letter of agreement

parameter	content
mailing address	0x01（default）
Baud rate	9600（default）
Data bit	8-bit
Parity bit	None
Stop bit	1-bit

2. 2 URAT communication commands and examples

（**1**）The module has two working modes, namely, active reporting and passive response. The default working mode is active reporting. In the active reporting mode, the device will send the current concentration value once every 1s. The device

can be modified to a question-and-answer type through instructions. In the question-and-answer state, only when an instruction is sent to the device, the device will restore the current concentration value.

（2）Active escalation mode

RX (receive) format is as follows：

		x	x	x		p	p	m	\r	\n

For example: The output format of 432ppm is as follows (hexadecimal)：

20	20	34	33	32	20	50	50	4d	0D	0A

（3）Where 0X20 is the hexadecimal code of the space, and the output ends with a newline character

（4）Note: If the serial port data display adopts ASCII code format, the current gas concentration value will be displayed directly.

(5) Set the communication mode

(6) TX(Send) The format is as follows：

Start bit	address	Command byte	Communication mode	--	--	--	--	Checksum
0xFF	0x01	0x03	0x**	0x00	0x00	0x00	0x00	0**

RX (receive) format is as follows：

Start bit	address	Command byte	state	--	--	--	--	Checksum
0xFF	0x01	0x03	0x**	0x00	0x00	0x00	0x00	0**

Send: FF 01 03 01 00 00 00 00 FC can be switched to active

reporting

Return: FF 01 03 01 01 00 00 00 FB means the setting is successful

Send: FF 01 03 02 00 00 00 00 FB is closed and actively report

Return: FF 01 03 02 01 00 00 00 FA means the setting is successful

Send: FF 01 03 03 01 00 00 00 F9 passive inquiry PPM mode

Return: xxxxx+ppm (ASCII code, value + unit PPM)

Communication mode: 0x01 stands for active reporting, 0x02 stands for close active reporting, and 0x03 stands for passive inquiry;

The status 0x00 in the return instruction indicates failure, and 0x01 indicates success.

Register address

Register address	PLC configuration address	content	operate
0005H	40006	Nitric oxide concentration (in ppm)	Read only
0100H	40101	Device address (0-252)	Read and write
0101H	40102	Baudrate (2400/4800/9600)	Read and write
0020H	40021	Manual calibration instructions	Write only

2.3Communication protocol example and explanation

Read the gas concentration value of module address 0x01, the format is as follows:

send:

Address code	functio n code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x03	0x00,0x05	0x00,0x01	0x94	0x0B

take over:

Address code	functio n code	Valid byte	Gas concentration value	Check code low bit	High bit of check code
0x01	0x03	0x02	0x01,0xD7	0xF9	0x8A

Gas concentration value: 01D7H (hexadecimal) = 471 (decimal) => gas concentration = 471ppm

Modify the module device address, the format is as follows:

send:

Address code	functio n code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x06	0x01,0x00	0x00,0x02	0x09	0xF7

take over:

Address code	functio n code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x06	0x01,0x00	0x00,0x02	0x09	0xF7

Send: 01 06 01 00 00 02 09 F7 Change the module address 01 to 02.

Modify the module baud rate, the format is as follows:

Send:

Address code	functio n code	initial	Data	Check	High bit

		address	length	code low bit	of check code
0x01	0x06	0x01,0x01	0x00,0x01	0x18	0x36

take over:

Address code	functio n code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x06	0x01,0x01	0x00,0x01	0x18	0x36

Send: 01 06 01 01 00 01 18 36. Change the baud rate of the module from 9600 to 4800.

The data length 0x00, 0x00 represents 2400, 0x00, 0x01 represents 4800, 0x00, 0x02 represents 9600.

Calibrate the device, the format is as follows:

Send：

Address code	functio n code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x06	0x00,0x20	0x00,0x01	0x49	0xC0

Take over：

Address code	functio n code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x06	0x00,0x20	0x00,0x01	0x49	0xC0

Note: Please warm up the device in a normal environment for about 10 minutes before calibration.

2.4DA output (analog voltage signal)

The voltage output range and corresponding range can be customized according to customer needs

For example: 0-5V corresponds to output 0-2K ppm

Voltage signal output range: 0-5V (default)

Chapter3 Appendix

3.1Precautions for use

(1) During the welding, installation, and use of the sensor, the alloy tube cavity of the sensor should be prevented from being subjected to pressure in any direction.

(2) The sensor should be far away from heat sources and avoid other heat radiation.

(3) The measured gas passing into the cavity must pass through a dust filter.

(4) In order to ensure that the sensor can work normally, the power supply voltage must be kept in the range of 9V-24V DC, and the power supply current must be no less than 150mA. If it is not within this range, the sensor may malfunction, the sensor output concentration is low, or the sensor cannot work normally.