NH4 Sensor

Model: NH4485

Operation Manual

V1.03



JNC technology

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Catalogue

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PART 1. PRODUCT DESCRIPTION

1-1 SPECIFICATION

NH4 Specification		Temperature Specification	
Measuring range	0～1000mg/L(ppm) Slope reading 70~130% Zero point potential -50~50mv	Temperature principle	NTC30K
		Measuring range	-10~120°C(ATC)
		Accuracy	±0.2°C
Accuracy	±5% reading±0.5mg/L	Resolution	0.1°C
Resolution	0.01 mg/L	Reproducibility	0.1°C
Reproducibility	±3% reading±0.5 mg/L	Other Specificatio	
Electrode withstand voltage	Max. 50 Psig	Link above	3/4" NPT
Operating temp	0~40°C	Link below	M42
Response time	T90 ≤ 120 seconds	Housing Material	PP, acid and alkali resistance/food grade/ zero dissolution
		Dimension	ø45*L214mm
Communication	RS-485Modbus RTU Web Browser direct reading (192.168.1.80)	Weight	≤340g
		Power	Automatic cleaning:12 or 24 VDC(optional) No automatic cleaning:9～36VDC
Certificate	CE,FCC	Power consumption	Automatic cleaning:1.6w No automatic cleaning:0.8w
		Ingress Protection	IP68

Part 2. Wiring method

Line Color	Function	Line Color	Function
Red	DC 12~24V	Black	GND
White	RS485 : D+(A)	Green	RS485 : D-(B)
Yellow	Auto Cleaning pump (V+)	Blue	Auto Cleaning pump (V-)

PART 3. EQUIPMENT OPERATING INSTRUCTIONS

3-1 CONNECTION METHOD

Search for the Wifi signal on your mobile phone, find the Wifi name WQS_NH4_XXXXX, and connect to the device, where XXXXX is the device serial number. After connecting, open the "Chrome browser" and enter "192.168.1.80" to enter the device screen, as shown in Figure 1 .



(Figure 1 .Sensor Home Page)

3-2 CALIBRATION METHOD

Click on the value on the screen to enter the calibration mode, as shown in Figure 2. At this time, the Modbus communication value will keep the concentration value when you click on the calibration. Therefore, it is recommended to click on the calibration before taking out the sensor, and then it is in the calibration mode. Select "Standard Solution Calibration" or "Gain and Offset" according to your needs as shown in Figure 3.



(Figure 2 calibration mode)



(Figure 3『Standard Solution Calibration』or『Gain and Offset』)

3-3 AUTO CLEANING SETTINGS

Click Settings at the bottom of the homepage to enter the automatic cleaning setting page, as shown in Figure 4. You can set the required self-cleaning cycle according to the usage mode.



(Figure 4. Auto cleaning settings)

3-4 SYSTEM SETTINGS

Click the menu in the upper left corner to enter "System Settings", where you can directly perform RS485 related settings, as shown in Figure 5.



(Figure 5.System Settings)

PART 4.MAINTENANCE AND CLEANING

4-1 REMOVE THE NOZZLE

Hold the blue mechanism and take out the air tube



Rotate the nozzle and remove it



4-2 INSTALL THE CLEANING BOTTLE

The cleaning solution is recommended to be 1:1 diluted bleach (bleach for laundry))



Soak for 10 minutes (or increase the time if appropriate)



4-3 RINSE WITH WATER



Clean the sensor with a soft brush



4-4 REPLACE THE NOZZLE



Confirm whether the nozzle is aligned with the electrode surface



Complete after reinstalling the air pipe



Part 5.CALIBRATION INSTRUCTION

5-1 CONNECT YOUR PHONE TO WI-FI (PRODUCT SERIAL NUMBER)

The product serial number is marked on the sensor sticker





5-2 OPEN THE GOOGLE BROWSER, THE URL IS (192.168.1.80)



5-3 ENTER THE CALIBRATION SCREEN (STANDARD SOLUTION CALIBRATION)

Click on the NH4 value to enter the calibration page



Click on standard solution calibration





5-4 REMOVE THE NOZZLE

Hold the blue mechanism and take out the air tube



Rotate the nozzle and remove it



5-5 INSTALL THE NH4 10 CALIBRATION BOTTLE TO PERFORM CALIBRATION



Wait for the value to stabilize around 10

Press the START button of high point 10





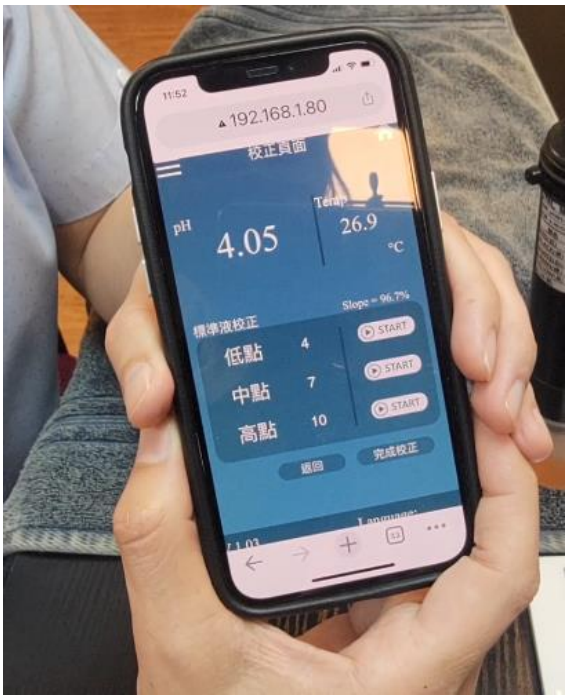
After waiting for the calibration seconds to expire, the calibration of NH4 10 is completed.

5-6 INSTALL THE NH4 1 CALIBRATION BOTTLE TO PERFORM CALIBRATION

If you want to continue calibrating NH4 1, please rinse it with clean water first.



Wait for the value to stabilize around 1

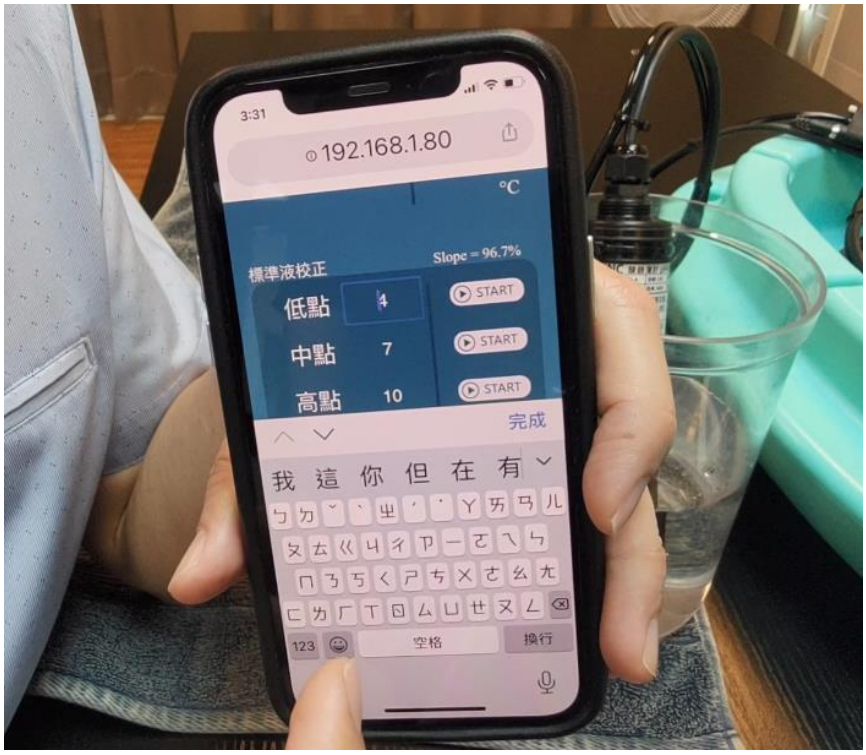


Press the START button of low point 1



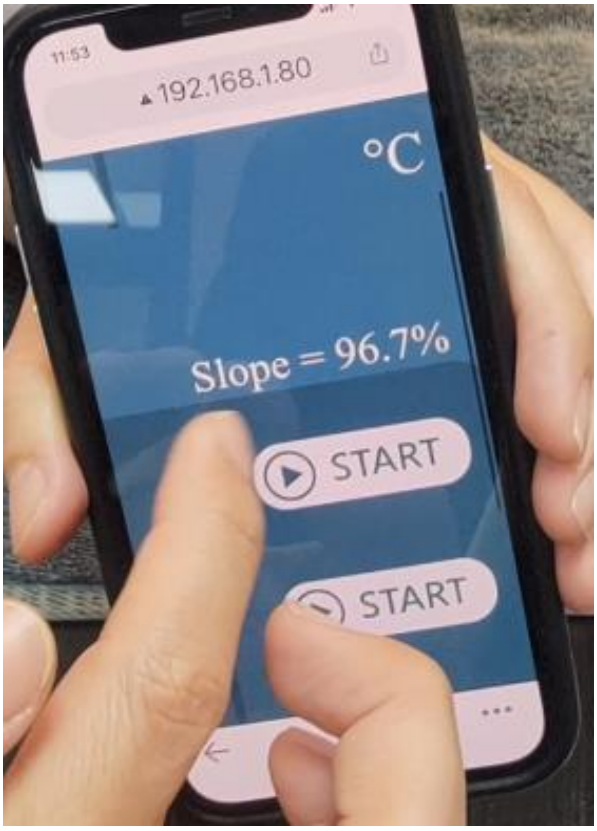
After waiting for the calibration seconds to expire, the calibration of NH4 1 is completed.

5-7 SAMPLE CONCENTRATION CAN BE ENTERED TO PERFORM CALIBRATION



5-8 VIEW SLOPE





5-9 REPLACE THE NOZZLE



Confirm whether the nozzle is aligned with the electrode surface



Complete after reinstalling the air pipe



PART 6.MODBUS TABLE

Function 3 to Read/Function 6 to write					
Address	Setting Value	Item	Type	R/W	Remarks
0x0000	400001	NH4 instant value	INT16	R	Value/100
0x0001	400002	Temp. instant value	INT16	R	Value/10
0x000A	400011	Temp. instant value	INT16	R	Value/10
0x000C	400013	Current electrode potential (Float low bit)	FLOAT	R	Unit：mV
0x000D	400014	Current electrode potential (Float high bit)	FLOAT	R	Unit：mV
0x0015	400022	RS485 station number	INT16	R/W	Can be set: 1～254
0x0016	400023	RS485 transmission rate	INT16	R/W	B2400=0,B4800=1,B9600=2, B19200=3,B38400=4, B57600=5,B115200=6
0x001E	400031	NH4 instant value (Float low bit)	FLOAT	R	
0x001F	400032	NH4 instant value (Float high bit)	FLOAT	R	
0x0020	400033	Temp.instant value (Float low bit)	FLOAT	R	
0x0021	400034	Temp.instant value (Float high bit)	FLOAT	R	
0x0030	400049	Sensor status	INT16	R	0: Value reading/1: Automatic cleaning 2: Numerical value keeping/3: Calibrating
0x0031	400050	Electrode Slope	INT16	R	Value/10
0x0032	400051	Temp. Slope	INT16	R	Value/10

Function (04H)					
Address	**Setting Value**	**Item**	**Type**	**R/W**	**Remarks**
0x0000	300001	Instant value	INT16	R	Value/100
0x0001	300002	Temp. instant value	INT16	R	Value/10
0x000A	300011	Temp. instant value	INT16	R	Value/10
0x000C	300014	Current electrode potential (Float low bit)	FLOAT	R	Uint：mV
0x000D	300015	Current electrode potential (Float high bit)	FLOAT	R	Uint：mV
0x001E	300031	NH4 instant value (Float low bit)	FLOAT	R	
0x001F	300032	NH4 instant value (Float high bit)	FLOAT	R	
0x0020	300033	Temp. instant value (Float low bit)	FLOAT	R	
0x0021	300034	Temp. instant value (Float high bit)	FLOAT	R	

Function 1 to Read/Function 5 to write					
Address	**Setting Value**	**Item**	**Type**	**R/W**	**Remarks**
0x0000	000001	Automatic cleaning switch	On / off	R/W	

※The firmware version is v1.04 or above, which complies with the above Modbus table.

PART 7.MODBUS BYTE FORMAT DESCRIPTION

7.1 INT16 READS INSTANT VALUE (FUNCTION03)

Protocol format description								
	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	Address	0x03	0x00	0x00	0x00	0x01	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x03	Number of data*2		ByteH	ByteL	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	0x32	0x03	0x00	0x00	0x00	0x01	0x81	0xC9
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	0x32	0x03	0x02		0x02	0xC6	0x3D	0x72

Convert the sensor data bit 0x02C6 (hexadecimal) to decimal format to 710. According to the two decimal places, it is 710/100=7.1, and the NH4 is 7.1.

7.2 FLOAT READS INSTANT VALUE (FUNCTION03)

Protocol format description								
	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	Address	0x03	0x00	0x00	0x00	0x02	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x03	Number of data*2		WordL	WordH	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	0x32	0x03	0x00	0x1E	0x00	0x02	0xA1	0xCE
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	0x32	0x03	0x04		0x38	0xAC	0x40	0xE3	0x46	0x94

Rearrange the sensor data bit 0x38AC40E3 value so that the data bytes are exchanged so that the value is high byte first and low byte second 0x40E338AC. Then directly convert it to Float to 7.10, and the NH4 is 7.10.

Please refer to the online conversion tool:https://gregstoll.com/~gregstoll/floattohex/

7.3 INT16 READS INSTANT VALUE (FUNCTION04)

Protocol format description								
	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	Address	0x04	0x00	0x00	0x00	0x01	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x04	Number of data*2		ByteH	ByteL	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	0x32	0x04	0x00	0x00	0x00	0x01	0x34	0x09
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	0x32	0x04	0x02		0x02	0xC6	0x3C	0x06

Convert the sensor data bit 0x02C6 (hexadecimal) to decimal format to 710. According to the two decimal places, it is 710/100=7.1, and the NH4 is 7.1.

7.4 FLOAT READS INSTANT VALUE (FUNCTION04)

Protocol format description								
	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	Address	0x04	0x00	0x00	0x00	0x02	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x04	Number of data*2		WordL	WordH	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	0x32	0x04	0x00	0x1E	0x00	0x02	0x14	0x0E
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	0x32	0x04	0x04		0x38	0x62	0x40	0xE3	0x24	0x70

Rearrange the sensor data bit 0x386240E3 value so that the data bytes are exchanged so that the value is high byte first and low byte last 0x40E33862. Then directly convert it to Float to 7.10, and the NH4 is 7.10.

Please refer to the online conversion tool:https://gregstoll.com/~gregstoll/floattohex/

7.5 PERFORM AUTO CLEANING (Function05)

Protocol format description								
	Equipment station number	Function	Starting address		Control bit	Complement	16 CRC code	
Host command	Address	0x05	0x00	0x00	0xFF	0x00	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x05	Number of data*2		ByteH	ByteL	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Address		Control bit	Complement	16 CRC code	
Host command	0x32	0x05	0x00	0x00	0xFF	0x00	0x89	0xF9
	Equipment station number	Function	Address		Control bit	Complement	16 CRC code	
Reply from machine	0x32	0x05	0x00	0x00	0xFF	0x00	0x89	0xF9

Writing 0xFF to the control bit starts automatic cleaning.

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