JNC technology
銘祥科技實業股份有限公司

JNC

pH Sensor

pH485



For firmware v1.21i or later

V2.04

Contents

Symbols Used in This Manual 5

Product Overview and Features 6

[Before Use]

PART 1.SAFETY INFORMATION 7

1-1 Before You Read: Terms 8

1-2 Safety Message Levels 9

1-3 Safety Precautions 9

1-4 Pre-Operation Labels 10

PART 2.PRODUCT INTRODUCTION 11

2-1 What This Product Solves 11

2-2 What It Can Do 12

2-3 Specifications 13

PART 3.PART NAMES 16

3-1 Exterior Parts 16

3-2 Nameplate and Wire Colors 18

PART 4.INSTALLATION 19

4-1 Installation Requirements 19

4-2 Installation Methods 19

4-3 Wiring 19

4-4 First Power-Up 20

[Basic Operation]

PART 5.BASIC OPERATION 22

5-1 Connecting to the Device Web Page 22

5-2 Home Page Overview 24

5-3 Menu 26

5-4 Reading Hold Status 27

[Settings]

PART 6.SETTINGS 29

6-1 System Settings (RS-485) 30

6-2 Auto-Cleaning Settings 31

6-3 Language Selection 32

6-4 Firmware Update 33

[Troubleshooting]

PART 7.MAINTENANCE AND TROUBLESHOOTING 35

7-1 Cleaning and Maintenance 36

7-2 Calibration 38

7-2-1 pH Standard Solution Calibration 40

7-2-2 pH Gain and Offset 47

7-2-3 Water Temperature Calibration (Gain and Offset) 48

7-3 Calibration Record 50

7-4 Symptoms and Checks 51

7-5 Not a Malfunction 52

APPENDIX A.MODBUS REGISTER TABLE 53

A-1 Direction of Communication 53

A-2 Default Communication Settings 53

A-3 Register Tables 53

Symbols Used in This Manual

What you see	Meaning
WARNING (gray box)	Failure to comply may result in personal injury or equipment damage
CAUTION (gray box)	Failure to comply will result in recoverable problems such as incorrect settings or abnormal readings
Power off first	Disconnect power to this unit before proceeding (see 1-4 Pre-Operation Labels (p. 10))
Factory setting – do not change	Set up by JNC at the factory; changing it may prevent the host system from reading this unit
No label	You can complete the task yourself by following the steps in this manual
Red text	Key point
1 2	Corresponds to the same number in the screenshot or photo above
A gray-shaded line “Path: A → B”	Where to tap to open this screen
Blue underlined text (page N)	Another section of this manual. Click it in the electronic file; in the printed manual, turn to that page

Product Overview and Features

The product name is pH Sensor (pH485).

An IoT pH analyzer with dual interfaces, RS-485 and a Wi-Fi web page. It can be monitored remotely or on site directly with a mobile phone, with no meter and no app required, and provides accurate, stable pH values to any meter or software. Its IP68 integrated design allows it to be placed directly in rivers, reservoirs, tap water, wastewater, seawater, and other application environments.

Product Features:

- **Integrated design with built-in IoT communication and sensors; works on power-up with all functions built in.**
- **IP68 submersible, corrosion-resistant construction; can be immersed directly without a protective sleeve.**
- **High-strength, isolated cable can be deployed directly; both power and RS-485 communication are isolated and protected by surge isolation.**
- **With temperature compensation.**
- **Ultra-low power consumption, suitable for large-scale green-energy IoT deployment.**
- **Standard Modbus RTU protocol for connection to any host system.**
- **Scan the QR code with a mobile phone to join the device Wi-Fi; the device web page opens automatically, with no address to enter.**
- **Firmware can be updated directly from the device web page, with no disassembly and no external programming tool.**
- **Auto-cleaning (optional): includes a micro air pump with an adjustable cleaning schedule; the last reading is held during auto-cleaning, and the stabilization time is adjustable, extending the maintenance interval.**
- **Intelligent design that stores calibration parameters; after calibration, the unit can be installed directly on site.**
- **Guided calibration on the mobile web page: change calibration bottles with standard solution on site, with three-point calibration at low, middle, and high points (pH 4, 7, 10).**
- **During calibration and auto-cleaning, the last reading is held to prevent false operation, and the status can be read at the same time (calibrating / auto-cleaning / stabilizing / maintenance / slope error).**
- **The latest 10 calibration records (time, calibration point, value, slope) can be viewed on the device web page and via RS-485.**
- **Applications: wastewater, seawater, groundwater, aquaculture, and river and lake monitoring systems.**

PART 1.SAFETY INFORMATION

Questions Answered in This Chapter

- **Which terms should I understand before use?**
- **How many levels of warning boxes does this manual use?**
- **Which operations require powering off first, and which settings must not be changed?**

Not Covered in This Chapter

- **Installation location requirements → 4-1 Installation Requirements (p. 19)**
- **Cleaning and storage → PART 7 Maintenance and Troubleshooting (p. 35)**

1-1 Before You Read: Terms

Term	Meaning	On-site example
pH	How acidic or alkaline the water is, from 0 to 14; 7 is neutral, below 7 is acidic, and above 7 is alkaline. Shown as pH on the screen	7.12
Host system	The device or system that reads values from this unit via RS-485	PLC, control PC, JNC Cloud Box
Slave ID, baud rate	RS-485 communication parameters; this unit and the host system must use the same settings to communicate	Slave ID 50, 9600 bps
Device web page	The screen opened in a browser after a mobile phone connects to this unit's Wi-Fi	View real-time values, calibrate, change the slave ID
Auto-cleaning	Optional function: an air pump blows air through the air tube and nozzle to clean the probe at set intervals	Cleans once every 60 minutes
Reading hold (Keep)	During auto-cleaning, calibration, and maintenance, the output reading is held at the last value and does not follow changes in water quality	The reading stays fixed during auto-cleaning
Standard solution	A calibration solution with a known pH value, filled in a calibration bottle	pH 4, pH 7, pH 10
Slope	The sensitivity of the electrode after calibration, expressed as a percentage; 100 % before calibration	98.6 %
Protective guard	The black protective cover over the probe; remove it before cleaning and calibration	—
Firmware	The program in the device. The version number is shown in the lower-left corner of the device web page	V 1.21i

1-2 Safety Message Levels

This manual uses two types of boxes to indicate risk. The level is identified by "WARNING/CAUTION" on the first line of the box:

WARNING

Failure to comply may result in personal injury or equipment damage.

CAUTION

Failure to comply will result in recoverable problems such as incorrect settings or abnormal readings.

1-3 Safety Precautions

Dear customer, thank you for choosing a JNC product. To maintain the service life of the product and ensure a good experience, read the following before operation.

1. The sensor is only for operation and monitoring in water; do not place it in a non-water location, to avoid abnormal damage to the sensor.
2. When the sensor is not in use, prepare a container and soak the sensor in ordinary water; do not expose it to sunlight, to avoid damage to the electrode or membrane that causes abnormal readings.
3. The sensor is fitted with a protective guard that prevents damage to the electrode probe from slight impacts; under a severe impact, the protective guard loses its protection, so handle the sensor with care.
4. Connect the wires according to the wiring functions and wire colors marked on the sensor housing; if the wires are connected incorrectly, the device will not operate properly (for wire colors, see 4-3 Wiring (p. 19)).
5. Clean the sensor regularly to maintain good monitoring quality; once a month is recommended (see 7-1 Cleaning and Maintenance (p. 36)).
6. For cleaning, soak the probe in citric acid solution for 5–10 minutes before cleaning locally, and avoid scratching the electrode tip.

For installation location requirements, see 4-1 Installation Requirements (p. 19).

1-4 Pre-Operation Labels

Operations without a label can be completed by following the steps in this manual. Operations requiring attention are marked with one of the following labels:

Label	Meaning	Example
Power off first	Disconnect power to this unit (at the host system or power supply) before proceeding	Wiring
Factory setting – do not change	Set up by JNC at the factory; changing it may prevent the host system from reading this unit	Slave ID, baud rate

PART 2.PRODUCT INTRODUCTION

Questions Answered in This Chapter

- **What problem does this device solve? What can it do?**
- **What do the specification values mean?**

Not Covered in This Chapter

- **Names of each part → PART 3 Part Names (p. 16)**

2-1 What This Product Solves

This unit is a pH sensor that is placed directly in water: it measures the pH and temperature of the water and provides real-time values to the host system via RS-485 (Modbus RTU).

- **Values for the host system: A PLC, control PC, or JNC Cloud Box reads the values via RS-485 for logging, cloud upload, or control of chemical dosing equipment.**
- **On-site operation: Connect a mobile phone to this unit's Wi-Fi to view real-time values, calibrate, set the communication parameters and auto-cleaning, and update the firmware.**

Applications: Wastewater, seawater, groundwater, aquaculture, and river and lake monitoring systems.

2-2 What It Can Do

Function	Description	See
Real-time values	The device web page shows pH and water temperature (°C)	5-2 Home Page Overview (p. 24)
Auto-cleaning (optional)	Blows air to clean the probe at the set interval; the reading is held during cleaning	6-2 Auto-Cleaning Settings (p. 31)
Reading hold	During auto-cleaning, calibration, and maintenance, the output reading is held at the last value, and a status code is provided	5-4 Reading Hold Status (p. 27)
Calibration	pH is calibrated with pH 4, 7, and 10 standard solutions (two points selected according to water quality), or by entering the gain and offset directly; water temperature is corrected with gain and offset	7-2 Calibration (p. 38)
Calibration record	The device web page keeps the latest 10 calibration records	7-3 Calibration Record (p. 50)
Firmware update	Upload a firmware file provided by JNC from the device web page	6-4 Firmware Update (p. 33)
Read by the host system	RS-485 (Modbus RTU)	Appendix A Modbus Register Table (p. 53)

2-3 Specifications

Description:

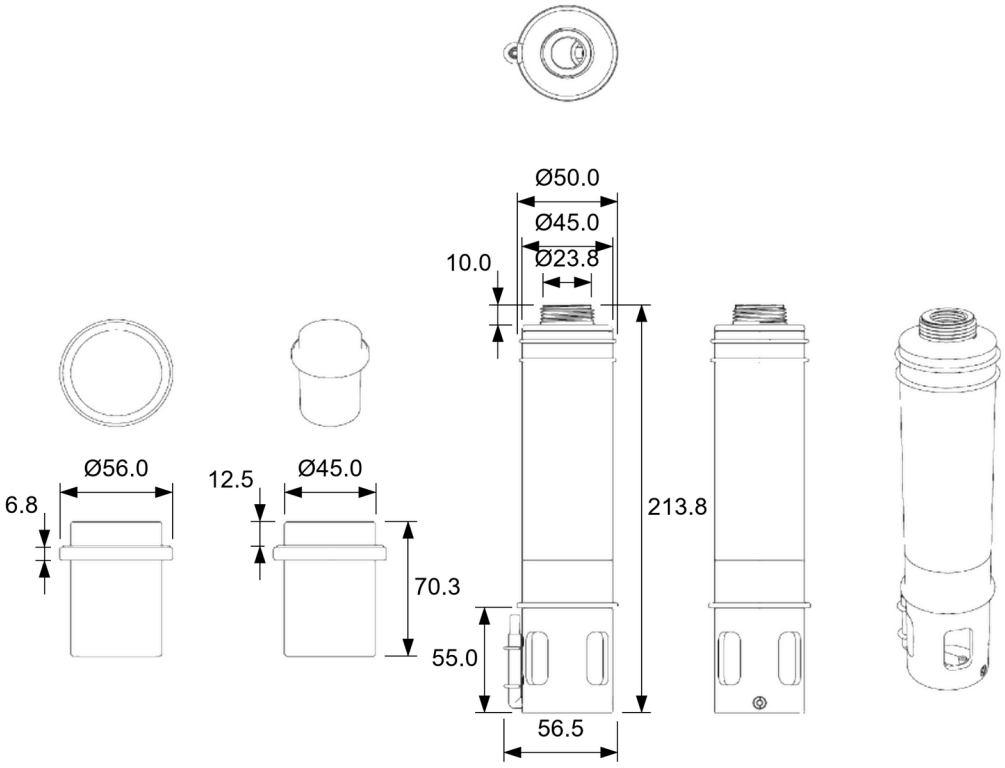
Item	Specification	Description
pH measuring range	0–14.00 pH	
Slope reading	70–130 %	
Zero potential	–50–50 mV	
pH accuracy	±0.02 pH	
pH resolution	0.01 pH	
Electrode pressure tolerance	Max. 100 psi	
Junction	Annular double junction	
Operating temperature	0–100 °C	
Response time	T90 < 5 seconds	The time for the reading to reach 90 % of the final change after the pH of the water changes
Measurement principle	Glass and reference electrodes measure the sample potential to determine hydrogen-ion activity	
Temperature sensing element	NTC30K	
Temperature measuring range	–10–120 °C	Automatic temperature compensation
Temperature accuracy	±0.2 °C	
Temperature resolution	0.1 °C	
Temperature repeatability	0.1 °C	

Item	Specification	Description
Power	Auto-cleaning type: 24 VDC (optional) Non-auto-cleaning type: 9–36 VDC	
Power consumption	Auto-cleaning type: 6.8 W Non-auto-cleaning type: 0.8 W	
Power isolation	1500 VDC	
Communication method	RS-485 Modbus RTU Wi-Fi device web page (no app needed; scan the QR code to open it automatically)	For the device web page, see 5-1 Connecting to the Device Web Page (p. 22)
Communication isolation	RS-485 2500 Vrms	
Device web page IP	192.168.1.80	
Data resolution	16-bit (0.001 % F.S.)	
Surge protection	8000 VDC	
Protection	Polarity, overload, short circuit	
RS-485 factory slave ID	50	
RS-485 factory baud rate	9600 bps	
Upper link thread	3/4” NPT thread	
Lower link thread	M42 thread	
Quick connector	M16 threaded Host system side: male connector, female pins, 6-pin Sensor side: male connector, male pins, 4-pin	

Item	Specification	Description
Housing material	Polypropylene (PP)	Acid and alkali resistant, food grade, zero dissolution
Electrode material	Glass	
Dimensions	ø50 × L213.9 mm	
Weight	≤ 340 g	
Waterproof rating	IP68 (CNS 14165)	Long-term underwater operation
Installation methods	Submersible, tee-mounted, insertion type	See 4-2 Installation Methods (p. 19)
Safety certification	CE (EU), FCC (US)	
Origin	Taiwan	

Specifications are based on the official catalog v1.27.

Product Dimensions (mm):



PART 3.PART NAMES

Questions Answered in This Chapter

- What are the protective guard, air tube, and probe on the exterior?
- What information is on the nameplate?

Not Covered in This Chapter

- How to install and wire the unit → PART 4 Installation (p. 19)

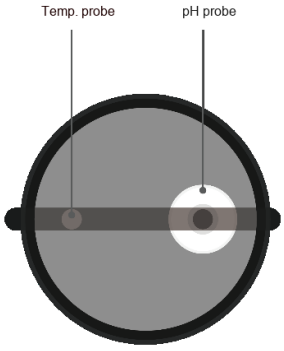
3-1 Exterior Parts



Description:

Code	Name	Function
1	Cable and quick connector	The cable connects to the host system and power supply; the quick connector is M16 threaded (for specifications, see 2-3 Specifications (p. 13))
2	Upper link thread	3/4" NPT thread for connecting pipe fittings during installation
3	Air tube and blue release collar	Air tube of the auto-cleaning type; the blue release collar is the blue ring on the air tube connector. Press it to remove the air tube
4	Protective guard	The black cover below the green ring; protects the probe; rotate it to remove before cleaning and calibration. On the auto-cleaning type, the nozzle is inside the protective guard
5	pH probe	Glass electrode; avoid knocks and scratches when cleaning
—	Nameplate	On the side of the housing; model, serial number, slave ID, baud rate, and wire colors (see 3-2 Nameplate and Wire Colors (p. 18))
—	Lower link thread	M42 thread inside the protective guard; the protective guard and calibration bottle are screwed on here

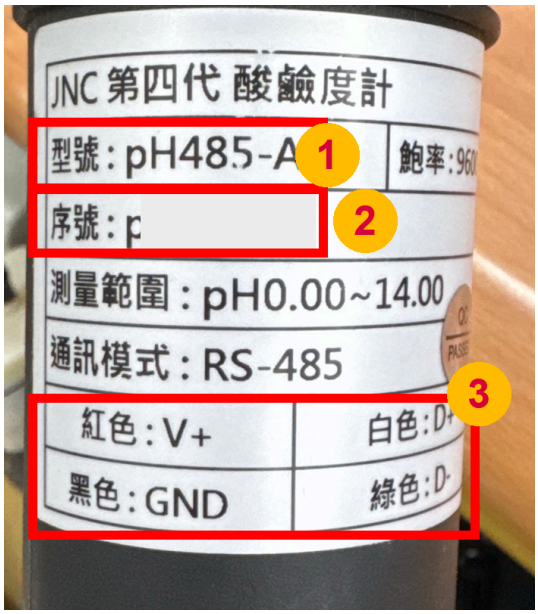
With the protective guard removed, the pH probe and temperature probe are visible; on the auto-cleaning type, the nozzle must point at the pH probe.



pH sensor top view

3-2 Nameplate and Wire Colors

The nameplate is attached to the housing of this unit. The serial number differs for each unit; check it on the nameplate or the device web page (see 6-1 System Settings (RS-485) (p. 30)).



Model, serial number, wire colors



Slave ID, baud rate, QR codes, auto-cleaning wire colors

Description:

Code	Name	Function
1	Model	Order model number of this unit
2	Serial number	Serial number of this unit; differs for each unit
3	Wire colors	Red V+, black GND, white D+, green D-
4	Baud rate, slave ID	RS-485 factory default baud rate 9600, slave ID 50
5	Device web page QR code (設備網頁)	Scan with a mobile phone to connect to this unit's Wi-Fi and open the device web page (see 5-1 Connecting to the Device Web Page (p. 22)); the 產品資訊 QR code on the left links to product information
6	Auto-cleaning wire colors	Yellow: auto-cleaning V+ Blue: auto-cleaning V- (auto-cleaning type)

For how to connect each wire of the cable, see 4-3 Wiring (p. 19).

PART 4.INSTALLATION

Questions Answered in This Chapter

- Where should the unit be installed, and what should be avoided?
- What installation methods are available?
- How is the cable connected? What should be checked after the first power-up?

Not Covered in This Chapter

- Names of each part → PART 3 Part Names (p. 16)
- Web page operation after power-up → PART 5 Basic Operation (p. 22)

4-1 Installation Requirements

Condition	Requirement	If not followed
Environment	Operate and monitor only in water; do not place the unit in a non-water location	Abnormal damage to the sensor
Installation height	It is recommended to keep the sensor about 1.5 meters from the bottom	Readings may not be reliable
Impact	Avoid severe impacts	The protective guard loses its protection and the electrode is damaged
Water temperature	0–100 °C	—
Water pressure	Electrode pressure tolerance max. 100 psi	—

4-2 Installation Methods

This unit can be placed directly in water without a protective sleeve. Three installation methods are available: submersible, tee-mounted, and insertion type. The upper 3/4” NPT thread connects to pipe fittings.

4-3 Wiring

Power off first

1. Make sure power is disconnected at the host system or power supply.

2. Connect each wire of the cable to the host system and power supply according to the table below (the wire colors are also marked on the nameplate; see 3-2 Nameplate and Wire Colors (p. 18)).
3. After all connections are complete (including the air pump below on the auto-cleaning type) and checked, apply power.

Communication can be established only when the wires are connected correctly.

Wire color	Connect to
Red	Power supply positive (auto-cleaning type 24 VDC; non-auto-cleaning type 9–36 VDC)
Black	Power supply negative GND
White	D+ of the host system's RS-485
Green	D- of the host system's RS-485
Yellow	Auto-cleaning V+: connect to the red wire of the supplied air pump power cable, not the red wire of this unit's cable (auto-cleaning type)
Blue	Auto-cleaning V-: connect to the black wire of the supplied air pump power cable (auto-cleaning type)

Quick connector models: the 6 pins on the host system side are, in order, V+, V-, D+, D-, auto-cleaning +, and auto-cleaning -; the 4 pins on the sensor side are V+, V-, D+, and D-. Auto-cleaning is controlled by this unit, so no separate auto-cleaning power supply is required.

Air pump of the auto-cleaning type:

1. The air pump is supplied with this unit. It runs on 24 VDC, powered by the yellow and blue wires of this unit.
2. One end of the supplied air pump power cable is a DC plug; insert it into the air pump. At the other end, connect the red wire to the yellow wire and the black wire to the blue wire.
3. Connect one end of the supplied air tube to the air outlet of the air pump, and insert the other end into the blue release collar of this unit (see 3-1 Exterior Parts).

4-4 First Power-Up

1. Connect the cable according to 4-3 Wiring (p. 19), and then apply power.
2. About 20 seconds after applying power, connect a mobile phone to the device web page (see 5-1 Connecting to the Device Web Page (p. 22)), and check that the home page shows readings for pH and water temperature.

3. **Check that the host system can read the values; the slave ID and baud rate of the host system must be the same as this unit (factory slave ID 50, baud rate 9600 bps; see 6-1 System Settings (RS-485) (p. 30)).**

RS-485 also starts responding about 20 seconds after power is applied.

PART 5.BASIC OPERATION

Questions Answered in This Chapter

- How do I connect to the device web page with a mobile phone?
- What does each area of the home page show?
- Why does the reading sometimes stay unchanged?

Not Covered in This Chapter

- Slave ID, baud rate, auto-cleaning, and other settings → PART 6 Settings (p. 29)
- Calibration → 7-2 Calibration (p. 38)

5-1 Connecting to the Device Web Page

This unit has a built-in Wi-Fi hotspot. Connect a mobile phone to it to open the device web page. The device web page does not require login.

1. Make sure this unit is powered on.
2. Scan the 設備網頁（請連接設備Wi-Fi） QR code on the nameplate with the mobile phone; or, in the Wi-Fi list of the mobile phone, connect to the hotspot named WQS_pH_ followed by the serial number (the serial number differs for each unit; see the nameplate). The hotspot does not require a password.
3. After connecting, the mobile phone automatically shows a connection page. Wait for the Open Device Page button to light up (within about 12 seconds), and then tap it; when the mobile phone asks whether to open it in the browser, tap “Open”. If the connection page does not appear, open 192.168.1.80 directly in the mobile phone’s browser; if the connection page appears but no prompt appears, tap “Done” in the upper-right corner of the connection page to close it, and then open the address in the mobile phone’s browser.

4 **The connection is complete when the home page (WQS Monitor System) appears (see 5-2 Home Page Overview (p. 24)). If a yellow prompt bar appears at the top of the home page, the page is still in the system pop-up window; follow the prompt to close the window, and open 192.168.1.80 in the mobile phone's browser instead.**



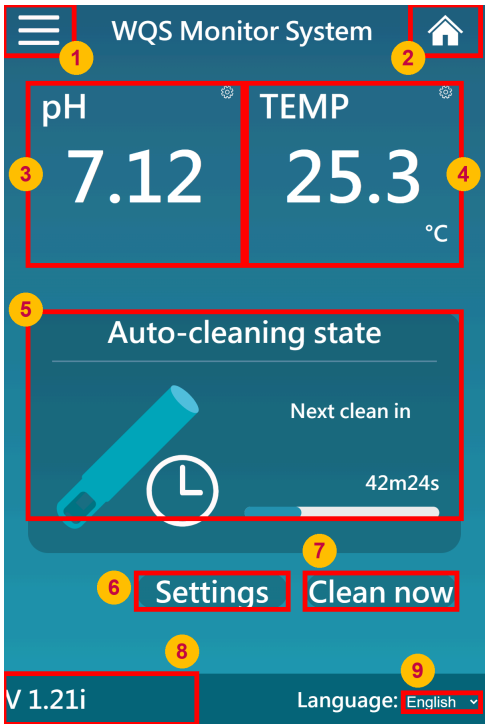
Description:

Code	Name	Function
1	Open Device Page	Opens the full device web page in the mobile phone's browser; lights up only after the network check is complete

If several units are nearby, identify each one by the serial number in the hotspot name.

5-2 Home Page Overview

This is the first page after you connect to the device web page. The real-time values are shown at the top and updated every second; the auto-cleaning status is shown below.



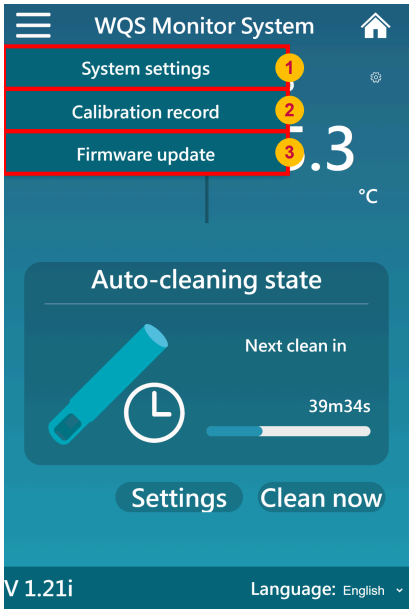
Description:

Code	Name	Function
1	Menu	Opens System settings, Calibration record, and Firmware update (see 5-3 Menu (p. 26))
2	Home	Returns to the home page; tapping it on the calibration page leaves the calibration page
3	pH (pH)	Real-time pH value. Tap the name, the value, or the gear icon to enter pH calibration (see 7-2 Calibration (p. 38))
4	Water temperature (TEMP)	Real-time water temperature value in °C. Tap the name, the value, or the gear icon to enter water temperature calibration
5	Auto-cleaning state	The current status and countdown time (see 5-4 Reading Hold Status (p. 27)). Shown only on the auto-cleaning type
6	Settings	Opens the auto-cleaning settings page (see 6-2 Auto-Cleaning Settings (p. 31)). Shown only on the auto-cleaning type
7	Clean now	Runs auto-cleaning once immediately; a confirmation appears first. Shown only on the auto-cleaning type
8	Firmware version	Firmware version of this unit
9	Language	Switches the interface language (see 6-3 Language Selection (p. 32))

If the connection between the mobile phone and this unit is lost, the title bar shows Connection lost and the last update time; the values on the screen are not real-time values, so reconnect to this unit's Wi-Fi.

5-3 Menu

Tap the menu 1 in the upper-left corner of the home page to open the following three items:



Description:

Code	Name	Function
1	System settings	Serial number, RS-485 slave ID, and baud rate (see 6-1 System Settings (RS-485) (p. 30))
2	Calibration record	The latest 10 calibration records (see 7-3 Calibration Record (p. 50))
3	Firmware update	Uploads a firmware file (see 6-4 Firmware Update (p. 33))

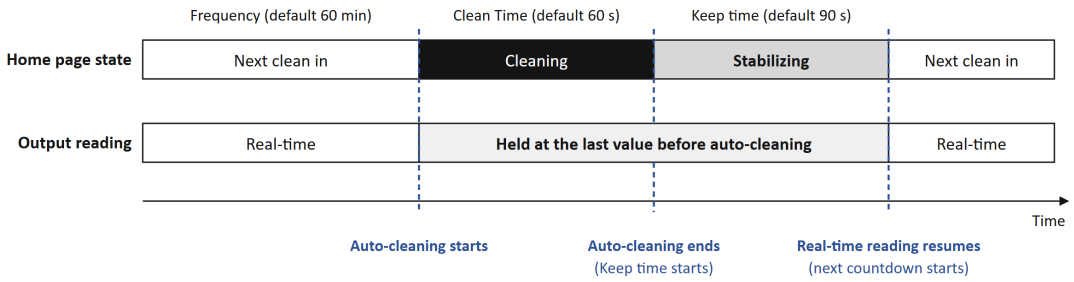
5-4 Reading Hold Status

During auto-cleaning, calibration, and maintenance, the reading this unit provides to the host system is held at the last value and does not follow changes in water quality, which prevents false operation of the host system. If the value does not change, first check whether the reading is being held. The status is shown on the home page only on the auto-cleaning type; on the non-auto-cleaning type, the host system reads the Modbus status code (0x0030) to determine it.

Status	Home page Auto-cleaning state	Modbus status code (0x0030)	Output reading	When it resumes
Normal reading	Next clean in and the countdown time; Reading and Auto-clean off when auto-cleaning is off	0	Real-time reading	—
Auto-cleaning	Cleaning	1	Held at the last value before auto-cleaning	Changes to Stabilizing when the clean time ends; the reading stays held
Keep	Stabilizing	2	Held at the last value before auto-cleaning	Real-time reading resumes when the Keep time ends
Calibrating	Calibrating	3	Held at the last value before entering the calibration page; the calibration page shows the real-time reading	Tap Complete, the home icon, or change the language; resumes automatically 5 minutes after the mobile phone disconnects, the screen locks, or the calibration page is closed

Status	Home page Auto-cleaning state	Modbus status code (0x0030)	Output reading	When it resumes
Maintenance	Value on hold	4	Held at the last value before maintenance started	The host system writes to turn off maintenance mode; if it is not turned off, the unit returns to normal reading automatically after 2 hours
Slope out of range	Slope error	5	Held at the last normal reading	Clean the probe and recalibrate (see 7-2 Calibration (p. 38))

Auto-cleaning timeline (values are factory defaults; actual values follow 6-2 Auto-Cleaning Settings (p. 31)):



- During auto-cleaning, values are highly unstable, so this unit holds the reading at the last value before auto-cleaning; the Keep time starts when the clean time ends.
- Maintenance mode is written by the host system via Modbus (see Appendix A Modbus Register Table (p. 53)); the device web page has no maintenance mode button. Maintenance mode cannot be entered or exited during auto-cleaning, Keep, or calibration.

PART 6.SETTINGS

Questions Answered in This Chapter

- Where do I change the RS-485 slave ID and baud rate?
- How do I set up auto-cleaning?
- How do I switch the interface language? How do I update the firmware?

Not Covered in This Chapter

- Calibration → 7-2 Calibration (p. 38)

Settings affect the values and communication read by the host system; notify other on-site personnel before changing them.

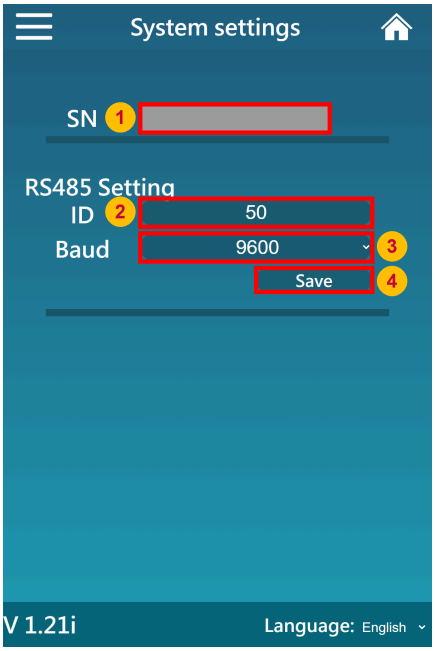
What to do	Section	Label
Check the serial number of this unit	6-1 System Settings (RS-485) (p. 30)	
Change the slave ID or baud rate	6-1 System Settings (RS-485) (p. 30)	Factory setting – do not change
Turn auto-cleaning on or off, change the auto-cleaning interval and time	6-2 Auto-Cleaning Settings (p. 31)	
Switch the interface language	6-3 Language Selection (p. 32)	
Update the firmware	6-4 Firmware Update (p. 33)	
Calibrate readings	7-2 Calibration (p. 38)	

6-1 System Settings (RS-485)

Factory setting – do not change

The slave ID and baud rate of this unit and the host system must match for the host system to read this unit.

Path: Home → Menu → System settings.



Description:

Code	Name	Function
1	SN	Serial number of this unit (read-only); the characters after WQS_pH_ in the Wi-Fi hotspot name are the same
2	ID	Slave ID, 1–254; factory default 50
3	Baud	Baud rate: 2400, 4800, 9600, 19200, 38400, 57600, or 115200 bps; factory default 9600
4	Save	Saves the slave ID and baud rate; a confirmation appears first

- **The slave ID takes effect immediately after it is sent; the baud rate takes effect only after power is cycled.**
- **If the slave ID is outside 1–254, the screen shows the valid range and the value is not sent.**

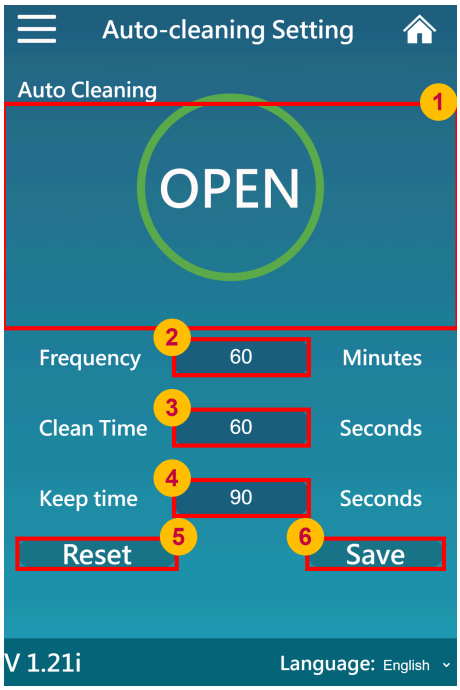
CAUTION: Change the host system at the same time

After the slave ID or baud rate is changed, the host system cannot read this unit unless its settings are changed to match.

6-2 Auto-Cleaning Settings

Auto-cleaning is an optional function (including an air pump and nozzle): at the set interval, the air pump blows air through the air tube and nozzle to clean the probe. The reading is held during cleaning (see 5-4 Reading Hold Status (p. 27)).

Path: Home → Settings (below Auto-cleaning state).



Description:

Code	Name	Function
1	Auto Cleaning	Tap the icon in the middle to switch between OPEN (on) and CLOSE (off). When CLOSE is shown, the three fields below are grayed out and cannot be changed
2	Frequency	The cycle at which the air pump starts, in minutes; 60–65535; default once every 60 minutes
3	Clean Time	How long the air pump runs each time, in seconds; 60–65535; default 60 seconds
4	Keep time	How long the reading stays held after the clean time ends, in seconds; 60–65535; default 90 seconds
5	Reset	Restores Frequency, Clean Time, and Keep time to the defaults (60 minutes, 60 seconds, 90 seconds); a confirmation appears first, and the values are saved immediately after you confirm
6	Save	Saves the settings of 1–4; the screen shows Complete

Setup Procedure:

1. Tap the icon at 1 to switch to OPEN; the three fields below can then be changed. To turn auto-cleaning off, switch to CLOSE and then tap 6 Save directly; if a range message appears, switch back to OPEN, change the values to within the range, then switch to CLOSE and tap Save.
2. Enter 2 Frequency, 3 Clean Time, and 4 Keep time.
3. Tap 6 Save to save. If you only switch the icon without tapping Save, the settings do not take effect.

If an entered value is out of range, the screen shows the valid range and the value is not sent.

CAUTION: Reset saves immediately after you confirm

After you tap Reset and confirm, Frequency, Clean Time, and Keep time are immediately restored to the defaults, and the previous values are not kept; the on/off state of Auto Cleaning is saved as currently shown on the screen, and the calibration values and slave ID stay unchanged.

When to use it: When the auto-cleaning settings have been changed incorrectly and you want to return to the defaults. Before tapping it, write down the three current values.

6-3 Language Selection

Use the Language drop-down list in the lower-right corner of the home page to select the interface language as needed: Traditional Chinese, Simplified Chinese, English, or Japanese. The language setting is stored in this unit and used the next time you connect. Switching the language during calibration interrupts the calibration.

6-4 Firmware Update

This operation is needed only when JNC provides a firmware update file.

Path: Home → Menu → Firmware update.



Description:

Code	Name	Function
1	Current version	The current firmware version of this unit
2	File selection button	Selects the update file OTA_ALL_v*.bin provided by JNC. The button text is provided by the browser and follows the phone language
3	Upload & Update	Starts the upload and update; the progress is shown below

Update Procedure:

1. Save the update file to the mobile phone or computer, and connect to the device web page.
2. Open Firmware update, and tap 2 to select the update file.
3. Tap 3 Upload & Update, and wait for the progress to complete, about 1–2 minutes. During this time, do not disconnect power and do not close the page.
4. After the update, this unit restarts automatically; reconnect to the Wi-Fi and check the firmware version in the lower-left corner of the home page.

- **If this unit has been running for more than 2 hours, or has been restarted by software, it first restarts automatically for about 1 minute before the update starts; during this wait, measurement and RS-485 are interrupted, and the page must not be closed.**
- **If the update is interrupted, this unit automatically restores the original version and retries 2 times. If it is still interrupted, the page prompts you to tap Upload & Update again; if the page shows Try restarting the device (no unplugging, ~1 min), tap it first and then update. If it is still interrupted, unplug the power for 10 seconds, plug it back in, wait about 1 minute, and then update again.**

PART 7.MAINTENANCE AND TROUBLESHOOTING

Questions Answered in This Chapter

- How often should the unit be cleaned, and how?
- How do I calibrate pH and water temperature?
- Where can I view the calibration record?
- What should I check first when I see a symptom? Which conditions are not malfunctions?

Not Covered in This Chapter

- Disassembly and repair → contact JNC

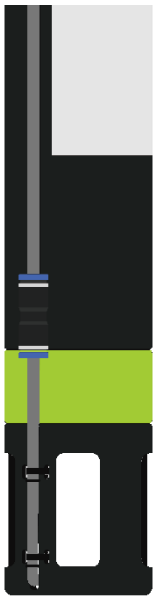
Clean and calibrate the sensor regularly to maintain good monitoring quality:

Item	How often	See
Clean the probe	Once a month	7-1 Cleaning and Maintenance (p. 36)
Calibrate	Depending on water quality; when readings are abnormal, after cleaning, or when a slope error appears	7-2 Calibration (p. 38)

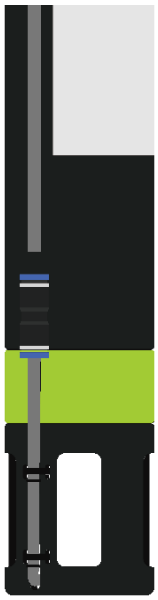
7-1 Cleaning and Maintenance

If the host system reading must stay unchanged during cleaning, the host system can write maintenance mode (see Appendix A Modbus Register Table (p. 53)), and write to turn it off after cleaning.

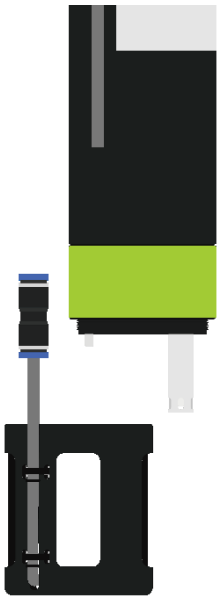
1. Remove the protective guard



Protective guard installed



Press the blue release collar and pull out the air tube



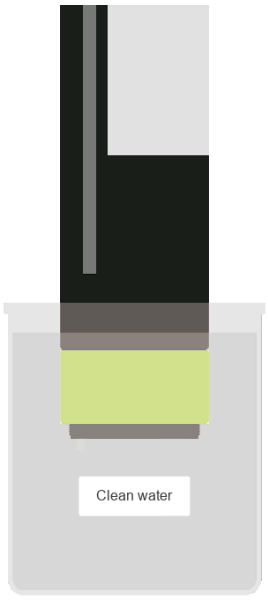
Rotate and remove the protective guard

1. **Press the blue release collar and pull out the air tube.**
2. **Rotate the protective guard and remove it.**

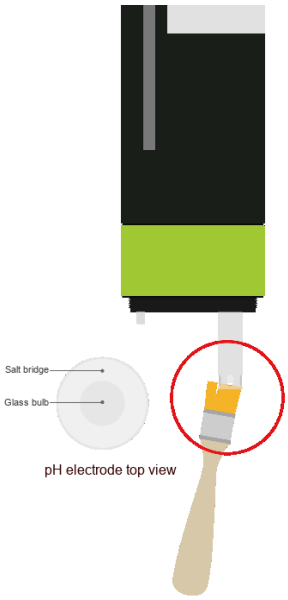
2. Clean



Fill the supplied calibration bottle with citric acid solution and soak for 5–10 minutes



Rinse in clean water



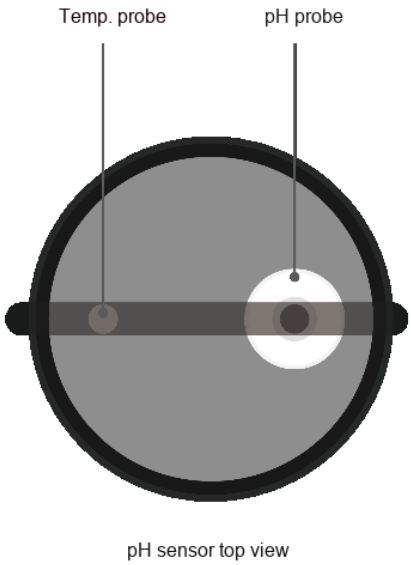
Clean the probe with a soft brush, especially the salt bridge and glass bulb

1. **Fill the supplied calibration bottle with citric acid solution (10 parts water to 1 part citric acid powder), and soak the probe for 5–10 minutes.**
2. **Immerse the sensor in water and rinse it with clean water.**
3. **Carefully clean the probe with a soft brush, paying particular attention to the salt bridge and glass bulb; avoid scratching the electrode tip.**

3. Restore the sensor



Reinstall the protective guard and insert the air tube into the blue release collar



pH sensor top view

Point the nozzle at the pH probe

1. **Reinstall the removed protective guard, and insert the air tube firmly into the blue release collar.**
2. **Make sure the nozzle points at the pH probe to keep the auto-cleaning function working.**

Storage when not in use: When the sensor is not in use, prepare a container and soak the sensor in ordinary water; do not expose it to sunlight.

7-2 Calibration

Calibrate when the reading does not match the actual value. pH has two calibration methods; water temperature has only gain and offset:

Calibration method	When to use	What you need
Standard solution calibration (pH)	Calibrate pH with standard solutions: low point pH 4, middle point pH 7, high point pH 10	Standard solution calibration bottles, clean water, soft cloth
Gain and offset (pH, water temperature)	The correction is known; enter the gain and offset directly	The calculated gain and offset

How gain and offset work: Reading = Sensor value × Gain + Offset (default gain 1.00 and offset 0.00, i.e., no correction). The Sample button on the calibration page does not apply to this unit and is grayed out.

CAUTION: The host system reading stays unchanged during calibration

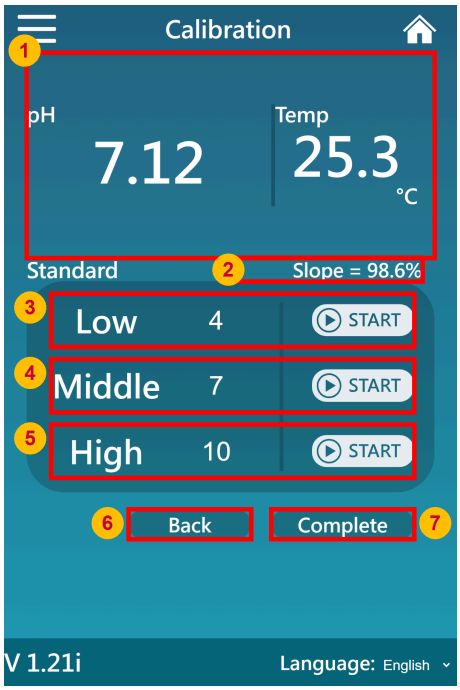
After you enter the calibration page, this unit's status is Calibrating (status code 3), auto-cleaning is paused, and the value read by the host system is held at the last value before entering. After you tap Complete, this unit immediately resumes outputting real-time readings, so restore the sensor and put it back in the water before tapping it (see 5-4 Reading Hold Status (p. 27)). This unit stays in calibration only while the calibration page reads values from it every second; keep the phone screen on and stay on the calibration page during calibration. 5 minutes after the mobile phone disconnects, the screen locks, or the calibration page is closed, this unit ends calibration automatically and resumes outputting real-time readings.

7-2-1 pH Standard Solution Calibration

CAUTION: Select the two calibration points according to the water quality

- **Water quality between pH 4 and pH 7: two-point calibration with pH 4 and pH 7 standard solutions.**
- **Water quality between pH 7 and pH 10: two-point calibration with pH 7 and pH 10 standard solutions.**

Path: Home → tap the pH value → confirm entering calibration mode → Standard.



Description:

Code	Name	Function
1	Real-time values	The calibration page shows the real-time pH and water temperature readings so you can judge whether they are stable
2	Slope	The current calibration slope; 100 % before calibration
3	Low	pH 4 calibration point. With the probe in pH 4 standard solution and the reading stable, tap START in this row
4	Middle	pH 7 calibration point. With the probe in pH 7 standard solution and the reading stable, tap START in this row
5	High	pH 10 calibration point. With the probe in pH 10 standard solution and the reading stable, tap START in this row
6	Back	Returns to the calibration method selection screen (still on the calibration page)
7	Complete	Ends calibration, leaves the calibration page, and returns to the home page

After you tap START, the screen shows Standard solution calibration started. Please do not leave this page!, and after you tap OK, that row counts down 5 seconds; when the countdown ends, the calibration of that point is saved, a calibration record is created, and the screen shows Complete; tap OK to continue with the next point. Do not switch pages during the countdown.

If you use a standard solution not provided by JNC, first tap the value in that row (4, 7, or 10), change it to the pH value marked on the standard solution, and then tap START.

If the reading differs from the value in that row by more than 1.5, the screen shows The error exceeds 1.5. Calibrate anyway?. The usual cause is the wrong standard solution:

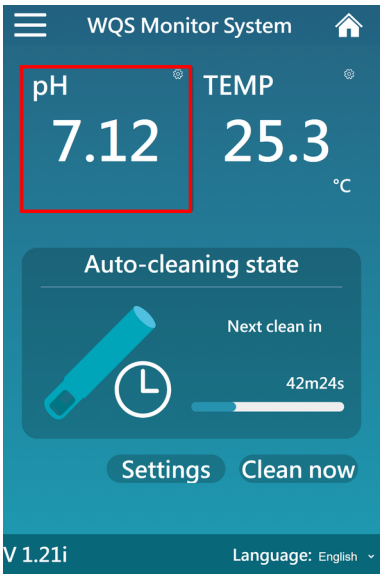
- Wrong standard solution: tap Cancel, change to the correct standard solution, and tap START again.
- Correct standard solution: tap OK to continue calibration.

Step 1: Connect to the device web page

Connect to the device web page according to 5-1 Connecting to the Device Web Page (p. 22).

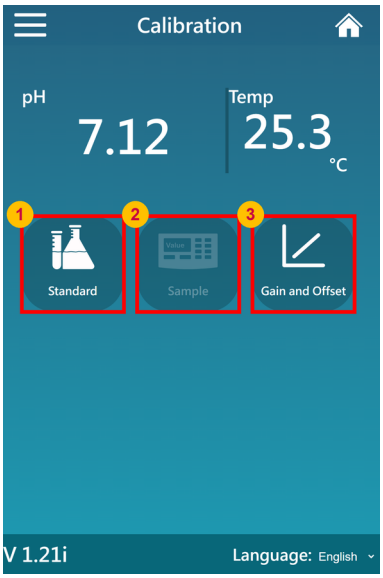
Step 2: Enter calibration mode

On the home page, tap the pH value (red box). When The sensor whether to enter calibration? appears, tap OK.



Step 3: Select standard solution calibration

Tap 1 Standard.

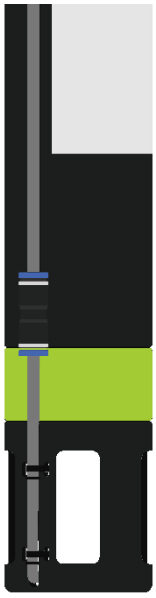


Code	Name	Function
1	Standard	Calibrates pH with standard solutions
2	Sample	Not applicable to this unit; grayed out
3	Gain and Offset	Enter the gain and offset directly

If you do not want to calibrate, tap the home icon at the top right to leave calibration mode.

Step 4: Remove the protective guard

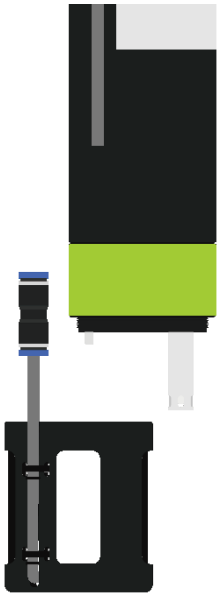
Take the sensor out of the water. Press the blue release collar and pull out the air tube; then rotate the protective guard and remove it.



Sensor exterior

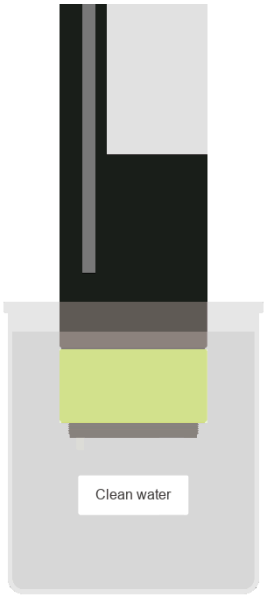


Press the blue release collar and pull out the air tube



Rotate and remove the protective guard

Step 5: Install the pH 7 calibration bottle



Rinse the probe with clean water and wipe it dry with a soft cloth



Screw the pH 7 calibration bottle onto the electrode probe



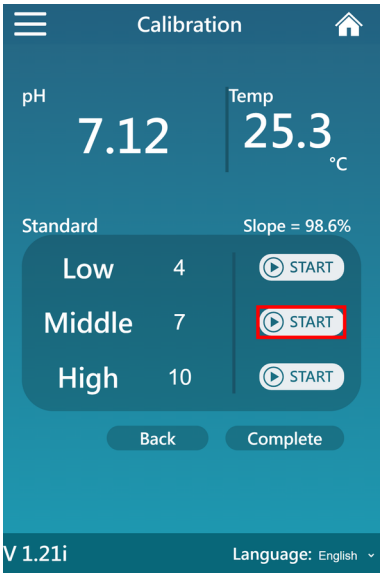
Tighten and shake gently so that the standard solution covers the probe

1 **Before calibration, rinse the probe with clean water and wipe it dry with a soft cloth.**

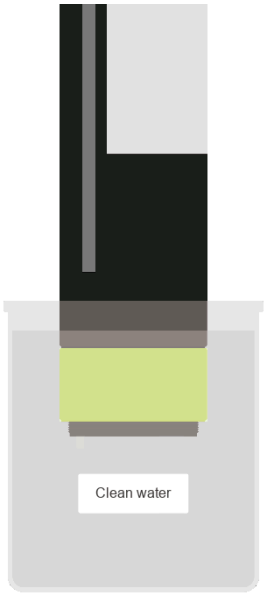
2 **Screw the pH 7 calibration bottle onto the electrode probe, tighten it, and shake it gently so that the standard solution completely covers the probe.**

Step 6: Middle point (pH 7) calibration

On the calibration page, wait until the value is stable and no longer changes, then tap START in the Middle row (red box), and tap OK when prompted; after the 5-second countdown, the screen shows Complete; tap OK again.



Step 7: Install the pH 4 calibration bottle



Rinse the probe with clean water and wipe it dry with a soft cloth



Screw the pH 4 calibration bottle onto the electrode probe

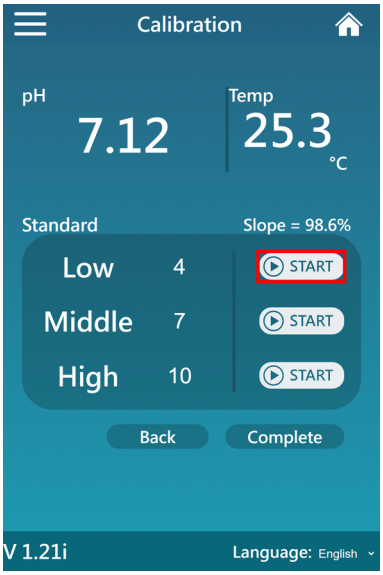


Tighten and shake gently so that the standard solution covers the probe

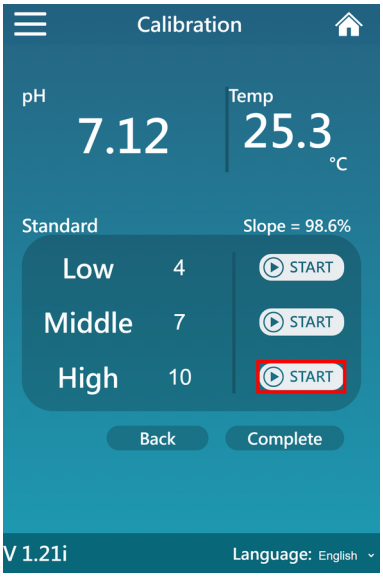
1. **Remove the pH 7 calibration bottle, rinse the probe with clean water, and wipe it dry with a soft cloth.**
2. **Screw the pH 4 calibration bottle onto the electrode probe, tighten it, and shake it gently so that the standard solution completely covers the probe.**

Step 8: Low point (pH 4) calibration

On the calibration page, wait until the value is stable and no longer changes, then tap START in the Low row (red box), and tap OK when prompted; after the 5-second countdown, the screen shows Complete; tap OK again.

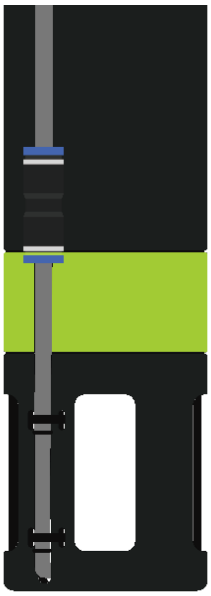


If the water quality is between pH 7 and pH 10, use the pH 10 calibration bottle in steps 7 and 8, and tap START in the High row (red box).

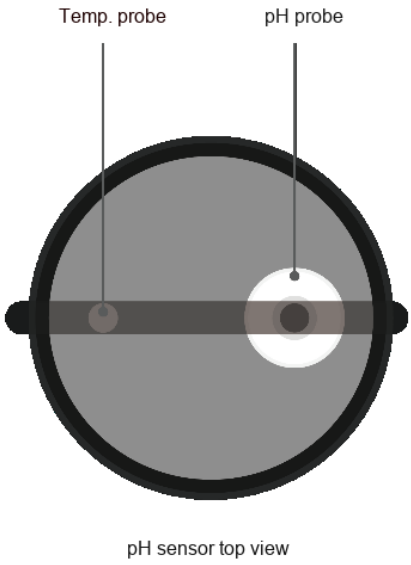


Step 9: Restore the sensor

Remove the calibration bottle, rinse the probe with clean water, reinstall the removed protective guard, and insert the air tube firmly into the blue release collar; make sure the nozzle points at the pH probe to keep the auto-cleaning function working. Put the sensor back in the water.



Reinstall the protective guard and insert the air tube into the blue release collar

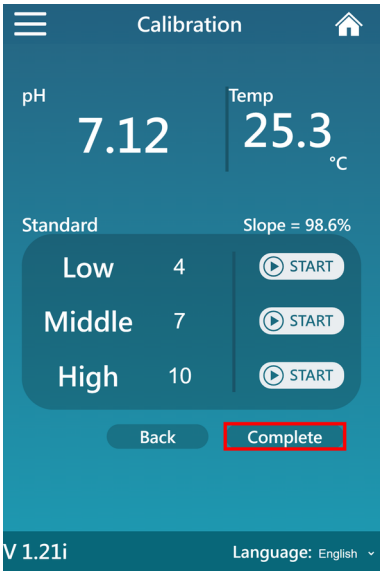


pH sensor top view

Point the nozzle at the pH probe

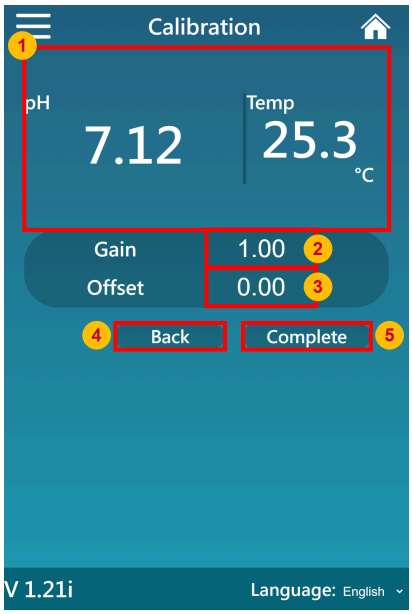
Step 10: Finish calibration

After the sensor is back in the water, tap Complete (red box) to leave the calibration page and return to the home page; this unit resumes outputting real-time readings.



7-2-2 pH Gain and Offset

Path: Home → tap the pH value → confirm entering calibration mode → Gain and Offset.



Description:

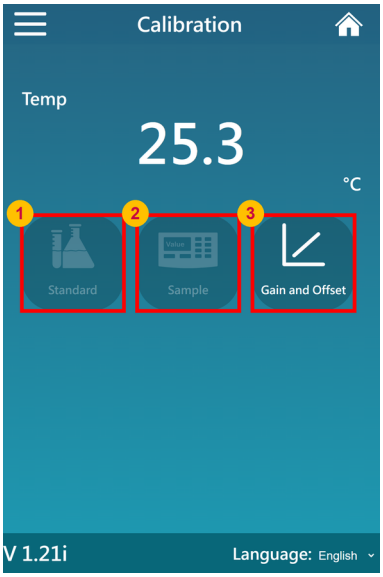
Code	Name	Function
1	Real-time values	The calibration page shows the real-time reading so you can judge whether it is stable
2	Gain	Tap the value and enter it; default 1.00; cannot be 0
3	Offset	Tap the value and enter it; default 0.00
4	Back	Returns to the calibration method selection screen without saving
5	Complete	Saves the gain and offset (the screen shows Complete) and leaves the calibration page

The gain and offset are saved only when you tap Complete. If a field is blank or not a number, the screen shows Please enter a number in every field and nothing is saved.

7-2-3 Water Temperature Calibration (Gain and Offset)

Path: Home → tap the water temperature (TEMP) value → confirm entering calibration mode → Gain and Offset.

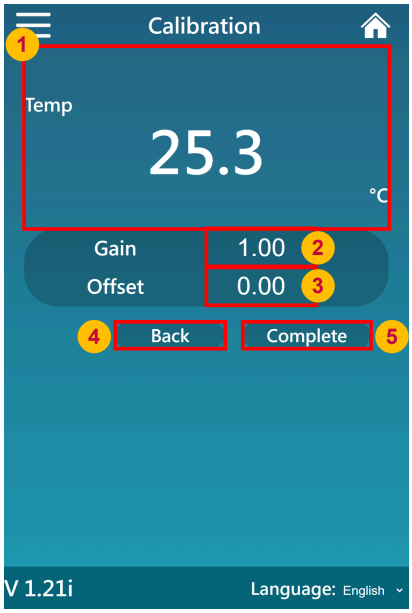
Water temperature only provides gain and offset; Standard and Sample are grayed out.



Description:

Code	Name	Function
1	Standard	Not applicable to water temperature; grayed out
2	Sample	Not applicable to water temperature; grayed out
3	Gain and Offset	Opens the gain and offset screen for water temperature

The screen after tapping 3 Gain and Offset:



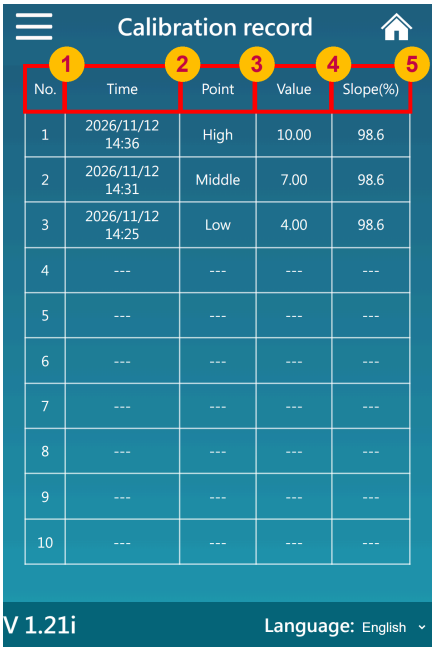
Description:

Code	Name	Function
1	Real-time value	The calibration page shows the real-time water temperature, so you can judge whether the reading is stable
2	Gain	Tap the value to enter it; default 1.00; must not be 0
3	Offset	Tap the value to enter it; unit °C; default 0.00
4	Back	Returns to the calibration method selection screen without saving
5	Complete	Saves the gain and offset (the screen shows Complete) and leaves the calibration page

7-3 Calibration Record

The time, calibration point, value, and slope of each standard solution calibration are recorded in this unit; the latest 10 records are kept. Gain and offset changes are not recorded.

Path: Home → Menu → Calibration record.



Description:

Code	Name	Function
1	No.	1–10; record 1 is the most recent
2	Time	Date and time of the calibration
3	Point	The calibration point of that calibration (Low, Middle, High)
4	Value	The value recorded for that calibration
5	Slope(%)	The slope after that calibration

Rows with no record show ---. The host system can also read the calibration record via RS-485 (see Appendix A Modbus Register Table (p. 53)).

7-4 Symptoms and Checks

First, check the following table.

#	Symptom	Check
1	This unit's hotspot is not in the Wi-Fi list	● Is this unit powered on? The hotspot appears about 20 seconds after power is applied ● Does the supply voltage meet the specifications (see 2-3 Specifications (p. 13))? ● Check the wiring against 4-3 Wiring (p. 19)
2	Connected to the hotspot, but the device web page does not open	● Open 192.168.1.80 in the mobile phone's browser ● If the computer is also connected to a wired network, disable the wired network before connecting
3	The host system cannot read this unit (communication error)	● Is there a problem with the power supply or wiring? Check the connections against 4-3 Wiring (p. 19) ● Do the slave ID and baud rate match the host system (see 6-1 System Settings (RS-485) (p. 30))? If the baud rate was changed, has power been cycled? ● When connecting from a computer through a USB-to-RS-485 converter, open "Device Manager", select "Ports (COM & LPT)", and check the port name of the USB-to-RS-485 converter
4	The reading does not change	● Is the unit auto-cleaning, in Keep, calibrating, in maintenance, or showing a slope error (see 5-4 Reading Hold Status (p. 27))?
5	The home page shows Slope error, or the status code is 5	● Clean the probe and recalibrate: see 7-1 Cleaning and Maintenance (p. 36) and 7-2 Calibration (p. 38)
6	Abnormal values	● Foreign matter is attached to the electrode probe: see 7-1 Cleaning and Maintenance (p. 36) ● The calibration interval has been reached: see 7-2 Calibration (p. 38)

7-5 Not a Malfunction

Symptom	Cause
The reading does not change during auto-cleaning and for a while afterward	The reading is held during auto-cleaning and the Keep time (see 5-4 Reading Hold Status (p. 27))
The host system reading does not change while the calibration page is open	The reading is held during calibration
The hotspot cannot be found right after power-up or a restart	The hotspot appears about 20 seconds after power is applied
After the baud rate is changed, the host system can still read this unit only at the old baud rate	The new baud rate takes effect only after power is cycled

APPENDIX A.MODBUS REGISTER TABLE

Who Should Read This Appendix

System engineers: when a PLC, control PC, or JNC Cloud Box needs to read the real-time values of this unit. General users do not need to read this appendix.

A-1 Direction of Communication

Situation	Role of this unit	Whose table to use
Another system reads the real-time values of this unit	Slave	This unit's table, i.e., this appendix

A-2 Default Communication Settings

Item	Value
Interface	RS-485 (Modbus RTU); for wire colors, see 4-3 Wiring (p. 19)
Factory defaults	Slave ID 50, baud rate 9600 bps, 8 data bits, no parity, 1 stop bit
Actual values	As set on the device web page under "System settings" (see 6-1 System Settings (RS-485) (p. 30))
Power-up	No response for about 20 seconds after power is applied

A-3 Register Tables

This unit has five types of registers: real-time values and system parameters (Function 03 read, Function 06/16 write), calibration records (Function 03 read), real-time values (Function 04 read), auto-cleaning and maintenance coils (Function 01 read, Function 05 write), and system commands (Function 06 write). Register No. = 400001 + address (Function 03, 06, 16), 300001 + address (Function 04), 000001 + address (Function 01, 05). The register tables in this appendix apply to firmware v1.21i.

Before using the tables, note the following five conventions:

- FLOAT and ULong occupy 2 addresses: the first address holds the low word and the next address holds the high word; to assemble the value, place the high word first and then convert (see the read and write examples at the end of this section). To write a FLOAT, use Function 16 to write both addresses at once.
- INT16 scaling: when the Remarks column says Value/100, the actual value is the reading ÷ 100; for Value/10, the reading ÷ 10. FLOAT readings are already actual values.

- The real-time temperature value can be read at both 0x0001 and 0x000A; the two are the same.
- The device model and serial number are ASCII; in each address the low byte is the earlier character and the high byte the later one.
- Saving after a write: a write takes effect immediately, and this unit saves once per second; wait at least 1 second after a write before disconnecting power. If the same type of setting is saved more than 15 times per hour, saving is delayed; do not write setting values periodically.

Real-Time Values and System Parameters (Function 03 read / Function 06, 16 write)

Address	Register No.	Item	Type	R/W	Remarks
0x0000	400001	pH real-time value	INT16	R	Value/100
0x0001	400002	Temperature real-time value	INT16	R	Value/10 Unit: °C
0x000A	400011	Temperature real-time value	INT16	R	Value/10 Unit: °C
0x000C–0x000D	400013–400014	Current electrode potential	FLOAT	R	Unit: mV
0x000E	400015	Device model (characters 1 and 2)	INT16	R	
0x000F	400016	Device model (characters 3 and 4)	INT16	R	
0x0010	400017	Device model (characters 5 and 6)	INT16	R	
0x0011	400018	Device serial number (characters 1 and 2)	INT16	R	
0x0012	400019	Device serial number (characters 3 and 4)	INT16	R	
0x0013	400020	Device serial number (character 5)	INT16	R	
0x0014	400021	Device version	INT16	R	Low 12 bits: version code; high 4 bits: sub-version letter (a = 1, b = 2, …) Example: 0x9115 = v1.21i
0x0015	400022	RS485 slave ID	INT16	R/W	Range: 1–254 Takes effect immediately after writing
0x0016	400023	RS485 baud rate	INT16	R/W	0: 2400 1: 4800 2: 9600 3: 19200 4: 38400 5: 57600 6: 115200 Takes effect after power is cycled
0x001A	400027	Sensor electrode type	INT16	R	0: pH
0x001B	400028	Auto-cleaning function available	INT16	R	0: No 1: Yes
0x001C	400029	Language	INT16	R/W	0: Traditional Chinese 1: Simplified Chinese 2: English 3: Japanese

Address	Register No.	Item	Type	R/W	Remarks
0x001E–0x001F	400031–400032	pH real-time value	FLOAT	R	
0x0020–0x0021	400033–400034	Temperature real-time value	FLOAT	R	Unit: °C
0x002A–0x002B	400043–400044	Electrode initial potential, point 1	FLOAT	R	Unit: mV
0x002C–0x002D	400045–400046	Electrode initial potential, point 2	FLOAT	R	Unit: mV
0x002E–0x002F	400047–400048	Electrode initial potential, point 3	FLOAT	R	Unit: mV
0x0030	400049	Sensor status	INT16	R	0: Normal reading 1: Auto-cleaning 2: Keep 3: Calibrating 4: Maintenance 5: Slope out of range
0x0031	400050	pH slope	INT16	R	Value/10 Unit: %
0x0032	400051	Temperature slope	INT16	R	Value/10 Unit: %
0x0036	400055	Auto-cleaning enabled	INT16	R	0: Disabled 1: Enabled Set on the device web page
0x0037	400056	Auto-cleaning frequency	INT16	R/W	Write unit: minutes (min. 1) Read unit: seconds
0x0038	400057	Clean time	INT16	R/W	Unit: seconds (min. 60)
0x0039	400058	Keep time (delay before reading values after cleaning)	INT16	R/W	Unit: seconds (min. 60)
0x0101	400258	pH decimal places	INT16	R	
0x0102–0x0103	400259–400260	pH gain	FLOAT	R/W	
0x0104–0x0105	400261–400262	pH offset	FLOAT	R/W	
0x0106–0x0107	400263–400264	pH raw range, point 1	FLOAT	R/W	
0x0108–0x0109	400265–400266	pH raw range, point 2	FLOAT	R/W	
0x010A–0x010B	400267–400268	pH raw range, point 3	FLOAT	R/W	
0x010C–0x010D	400269–400270	pH mapped range, point 1	FLOAT	R/W	
0x010E–0x010F	400271–400272	pH mapped range, point 2	FLOAT	R/W	
0x0110–0x0111	400273–400274	pH mapped range, point 3	FLOAT	R/W	
0x0121	400290	Temperature decimal places	INT16	R	
0x0122–0x0123	400291–400292	Temperature gain	FLOAT	R/W	

Address	Register No.	Item	Type	R/W	Remarks
0x0124–0x0125	400293–400294	Temperature offset	FLOAT	R/W	
0x0126–0x0127	400295–400296	Temperature raw range, point 1	FLOAT	R/W	
0x0128–0x0129	400297–400298	Temperature raw range, point 2	FLOAT	R/W	
0x012A–0x012B	400299–400300	Temperature raw range, point 3	FLOAT	R/W	
0x012C–0x012D	400301–400302	Temperature mapped range, point 1	FLOAT	R/W	
0x012E–0x012F	400303–400304	Temperature mapped range, point 2	FLOAT	R/W	
0x0130–0x0131	400305–400306	Temperature mapped range, point 3	FLOAT	R/W	

Calibration Record (Function 03 read)

There are 10 records. The start address of record n (n = 0–9, where 0 is the most recent) = 0x0300 + n × 0x20; the table below shows record 0, and the addresses of the other records increase by 0x20 in turn.

Address	Register No.	Item	Type	R/W	Remarks
0x0300–0x0301	400769–400770	Calibration time	ULong	R	Seconds since 2000/01/01 00:00:00
0x0302	400771	Year	INT16	R	
0x0303	400772	Month	INT16	R	
0x0304	400773	Day	INT16	R	
0x0305	400774	Hour	INT16	R	
0x0306	400775	Minute	INT16	R	
0x0307	400776	Second	INT16	R	
0x0308–0x0309	400777–400778	Calibration value	FLOAT	R	
0x030A–0x030B	400779–400780	Slope	FLOAT	R	Unit: %
0x030C	400781	Calibration point	INT16	R	0: Low 1: Middle 2: High

Real-Time Values (Function 04 read)

Address	Register No.	Item	Type	R/W	Remarks
0x0000	300001	pH real-time value	INT16	R	Value/100
0x0001	300002	Temperature real-time value	INT16	R	Value/10 Unit: °C
0x000A	300011	Temperature real-time value	INT16	R	Value/10 Unit: °C
0x000C–0x000D	300013–300014	Current electrode potential	FLOAT	R	Unit: mV
0x001E–0x001F	300031–300032	pH real-time value	FLOAT	R	
0x0020–0x0021	300033–300034	Temperature real-time value	FLOAT	R	Unit: °C
0x004E–0x004F	300079–300080	Device uptime	ULong	R	Unit: seconds
0x0050–0x0051	300081–300082	Device restart count	ULong	R	

Auto-Cleaning and Maintenance (Function 01 read / Function 05 write)

Address	Register No.	Item	Type	R/W	Remarks
0x0000	000001	Manual cleaning	—	R/W	Write FF 00 to run auto-cleaning once immediately; writes are ignored during calibration or within 15 seconds after power-up Read: 1 = cleaning
0x0001	000002	Maintenance mode	—	R/W	Write FF 00 to enable, 00 00 to disable If maintenance mode is not disabled, the system returns to normal reading automatically after 2 hours
0x0002	000003	Auto-cleaning mode	—	R/W	Write FF 00 to start auto-cleaning, 00 00 to stop Read: 1 = cleaning

System Commands (Function 06 write)

Address	Register No.	Item	Type	R/W	Remarks
0xFF52	465363	Restart	—	W	Write 1 to restart after 3 seconds Not accepted within 60 seconds after power-up

Read and Write Examples

In the following examples, the slave ID is always the factory slave ID 50 (0x32), and the CRC is the Modbus RTU 16-bit check code (low byte first); if the slave ID is different, recalculate the CRC for the actual slave ID. The pH reading in the examples is 7.10.

Example 1: Read the pH real-time value (Function 03, INT16)

Master request:

Slave ID	Function code	Start address	Quantity (words)	CRC
32	03	00 00	00 01	81 C9

Slave response:

Slave ID	Function code	Byte count	Data	CRC
32	03	02	02 C6	3D 72

Data 0x02C6 = 710, and 710 ÷ 100 = 7.10, so the pH is 7.10.

Example 2: Read the pH real-time value (Function 03, FLOAT)

Master request:

Slave ID	Function code	Start address	Quantity (words)	CRC
32	03	00 1E	00 02	A1 CE

Slave response:

Slave ID	Function code	Byte count	Data	CRC
32	03	04	38 AC 40 E3	44 38

The first 2 data bytes, 38 AC, are the low word (address 0x001E), and the last 2 bytes, 40 E3, are the high word (address 0x001F). Placing the high word first gives 40 E3 38 AC, which converts as FLOAT to 7.1007; rounded to 2 decimal places, the pH is 7.10.

Example 3: Read the pH real-time value (Function 04, INT16)

Master request:

Slave ID	Function code	Start address	Quantity (words)	CRC
32	04	00 00	00 01	34 09

Slave response:

Slave ID	Function code	Byte count	Data	CRC
32	04	02	02 C6	3C 06

Data 0x02C6 = 710, and 710 ÷ 100 = 7.10, so the pH is 7.10.

Example 4: Read the pH real-time value (Function 04, FLOAT)

Master request:

Slave ID	Function code	Start address	Quantity (words)	CRC
32	04	00 1E	00 02	14 0E

Slave response:

Slave ID	Function code	Byte count	Data	CRC
32	04	04	38 AC 40 E3	45 8F

Convert in the same way as Example 2: placing the high word 40 E3 first gives 40 E3 38 AC, which converts as FLOAT to 7.1007, so the pH is 7.10.

Example 5: Write maintenance mode (Function 05)

After maintenance mode is enabled, the value no longer changes and stays at the last reading before maintenance started.

Master request:

Slave ID	Function code	Start address	Write value	CRC
32	05	00 01	FF 00	D8 39

Slave response:

Slave ID	Function code	Start address	Data	CRC
32	05	00 01	FF 00	D8 39

Write value FF 00 enables and 00 00 disables.

For conversion, you can use this online tool: https://gregstoll.com/~gregstoll/floattohex/

Revision History

Version	Revision date	Revision description	Maintenance personnel
V1.09	2022/09/12	Add Modbus table	denny
V2.00	2023/09/01	Change manual style and process diagram	bin
V2.01	2023/10/06	Adjusted some content and added troubleshooting	bin
V2.02	2024/01/02	Added cover and label styles, and added Modbus commands	bin
V2.04	2026/11/19	Revised for firmware v1.21i	Ran

About us

717 No. 33, Ln. 428, Sec. 3, Wenhua Rd., Rende Dist., Tainan City, Taiwan

TEL: +886-6-311-0008

FAX: +886-6-311-0522

Tax ID number 28529427

https://www.jnc-tec.com.tw

Email: jnc.jnc@msa.hinet.net

JNC reserves the right to modify this manual without prior notice.