JNC technology
銘祥科技實業股份有限公司

JNC

City Weather Detector

CW9



For firmware v2.20 or later

V1.13

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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 data loss
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 cause the device to lose its connection
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 (p. 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 City Weather Detector (CW9).

This product is a sensor for fixed-point monitoring of outdoor environments. Its louvered wall-mount design blocks direct solar radiation and radiation reflected from the ground, protects the instrument from extreme weather, and keeps the sensors ventilated so that they respond more sensitively to changes in the outdoor environment. A range of optional measurement items is available, including temperature, humidity, CO2, PM2.5, CO, TVOC, O3, HCHO, and PM10. Real-time sensor values are returned accurately to the host system over the Modbus protocol, so you can monitor outdoor air quality in real time. This product is well suited to weather stations, environmental monitoring, factory self-management, facility agriculture, and other sites that require environmental monitoring.

Product Features:

- **Compact and lightweight, with a waterproof quick connector for easy installation.**
- **Automatic temperature compensation.**
- **RS-485 communication.**
- **Wi-Fi device web page: use a mobile phone or computer to set the slave ID and baud rate, perform calibration, and more.**
- **18 measurement items to choose from; up to 15 can be measured at the same time.**
- **Lightweight outdoor louvered radiation shield: accurate sensing, fast response, and efficient data transmission.**
- **Calculates the Heat Index (HI) and hazard level in real time; both can be read by the host system (requires the heat index option with temperature and humidity enabled).**
- **With the optional JNC Cloud Box, data can be sent directly to the cloud over 4G or NB-IoT.**
- **PM2.5 sensor rated Level 4, the highest application class of Taiwan's Ministry of Environment; data can serve as a supplementary reference for national monitoring stations.**
- **Noise meter complies with the IEC 60942 calibration standard.**
- **Application areas: weather stations, environmental monitoring, factory self-management, facility agriculture, and other sites that require environmental monitoring.**

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)**

1-1 Before You Read: Terms

Term	Meaning	On-site example
Channel	A measurement item of this unit. The channels of each unit depend on the options ordered (see 2-3 Check Which Channels This Unit Has (p. 12))	Temperature, humidity, CO2, PM2.5
Device web page	The settings screen opened in a browser after a mobile phone or computer connects to this unit's Wi-Fi	View real-time values, change the slave ID
Host system	The device or system that reads values from this unit via RS-485	PLC, SCADA, 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 1, 9600 bps
Four alarm levels	HIHI (high-high limit), HI (high limit), LO (low limit), and LOLO (low-low limit) on the screen	High limit 1000 ppm
T90	A specification column: the time for the reading to reach 90 % of its final change after the measured environment changes	CO2 < 90 s
Environmental equilibrium time	The time for the reading to stabilize after power-on or after moving to a new measurement environment	Temperature 10 min
Heat index	An apparent temperature calculated from temperature and humidity, then graded into heat hazard risk levels	Heat index 28.5 °C, Level 1 Caution
Firmware	The program in the device. The version number is shown in the upper-right corner of the device web page	v2.20

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 data loss.

1-3 Safety Precautions

1. Do not use this product at sites with strong vibration or strong electromagnetic interference; doing so may damage the product or cause ERROR indications or measurement errors.
2. Before any repair or maintenance, disconnect the power first to prevent personal injury or product damage from accidental contact with live parts.
3. When installing in an environment containing conductive contaminants (metal dust, water, and so on), provide suitable sealing, ventilation, or filtering.
4. Do not operate the product if any component or module has been removed or disassembled, and contact JNC as soon as possible.
5. This product is a precision instrument. Do not disassemble it yourself, and do not let corrosive liquids contact the instrument surface; otherwise it may be damaged.
6. JNC is not liable for any effects or damage caused by failure to use the product according to this manual, or by use beyond the applications and environmental conditions stated in the specifications.

For installation location requirements (heat sources, areas of human activity), see 4-1 Installation Requirements (p. 19); for wiring precautions, see 4-3 Wiring (p. 22).

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 cause the device to lose its connection	RS-485 communication parameters, sensor board terminals, firmware and web page update

PART 2.PRODUCT INTRODUCTION

Questions Answered in This Chapter

- What problem does this device solve? What can it do?
- How do I check which channels my unit has?
- What do the specification values mean?

Not Covered in This Chapter

- Names of the parts → PART 3 Part Names (p. 17)

2-1 What This Device Solves

This unit is a louvered sensor installed outdoors. It measures temperature, humidity, multiple gases, particulate matter, noise, and atmospheric pressure at the same time, and provides real-time values to the host system via RS-485 (Modbus RTU).

- Louvered radiation shield: blocks direct sunlight and reflections from the ground while maintaining ventilation, so the sensors measure the ambient air.
- Data for the host system: a PLC, SCADA system, or JNC Cloud Box reads values via RS-485 for logging, cloud upload, or control of other equipment.
- On-site settings: connect a mobile phone to this unit's Wi-Fi to view real-time values, set communication parameters, and perform calibration.

Application areas: weather stations, environmental monitoring, factory self-management, facility agriculture.

2-2 What It Can Do

Function	Description	See
Real-time values	The device web page shows the real-time value and status of each channel	5-3 Dashboard Page Overview (p. 26)
Heat index	With the heat index option and temperature and humidity enabled, calculates the heat index and heat hazard risk level	2-4 Specifications (p. 13)
Alarm limits	The host system sets the high-high, high, low, and low-low limits of each channel via Modbus; once alarms are enabled and a limit is exceeded, the card on the web page changes color and the host system can read the alarm status	6-3 Alarm Limits (p. 34)
Calibration	Corrects readings with gain and offset; provides two aids, zeroing and adjusting the gain to a reference value	7-4 Calibration (p. 41)
Reading by the host system	RS-485 (Modbus RTU)	Appendix A Modbus Register Table (p. 46)

2-3 Check Which Channels This Unit Has

The channels of this unit depend on the options ordered. This manual describes the standard configuration; for options, contact your sales representative or see the product catalog on the official website. To check which channels your unit has:

1. Check the device web page: after connecting to the device web page, the Dashboard page shows only the channels enabled on this unit, with one card per channel (see 5-3 Dashboard Page Overview (p. 26)).
2. Read via Modbus: use Function 03 to read the channel enable status (addresses 0x0020 and 0x0021); each bit represents one channel (see Appendix A Modbus Register Table (p. 46)).

A channel that was not ordered has no card on the Dashboard page. This is not a malfunction.

2-4 Specifications

Description:

Item	Specification	Notes
Power	DC input 9–36 V	
Power consumption	1.8 W	
Environment	–10 to 60 °C, 0–100 % (non-condensing)	Operating environment of this unit; for the operating temperature of each channel, see the measurement specifications below
Communication	RS-485 Modbus RTU	For the Wi-Fi used for settings, see 5-1 Connect to the Device Web Page (p. 24)
Housing material	ASA, UV-resistant	
Mounting	Louvered wall-mount	
Product dimensions	Outer diameter 140 mm, overall height 240 mm	Overall height includes the threaded rods and wing nuts at the bottom
Bracket dimensions	135×90×125.9 mm	L×W×H; see 4-2 Mounting Bracket and Installation (p. 20)
Weight	≤ 2 kg	
Cable length	3 m	
Safety certification	EU CE and US FCC certified	

Sensor Measurement Specifications:

Channel (principle)	Range	T90	Operating temp.	Resolution	Accuracy	Equilibrium time
Temperature Temp (resistive)	–40 to 125 °C	< 60 s	–20 to 60 °C	0.1 °C	±0.4 °C	10 min
Humidity RH (capacitive)	0–100 %	< 60 s	–20 to 60 °C	0.1 %	±3 %	10 min

Channel (principle)	Range	T90	Operating temp.	Resolution	Accuracy	Equilibrium time
CO2 (infrared)	0–10,000 ppm	< 90 s	0 to 50 °C	1 ppm	±30 ppm ±3 % of reading	10 s
PM2.5 (laser)	0–1,000 µg/m³	< 90 s	−10 to 65 °C	0.1 µg/m³	±10 µg/m³ ±5 % of reading	5 min
HCHO (electrochemical)	0.01–2.00 ppm	< 120 s	−10 to 50 °C	0.01 ppm	≤ ±0.02 ppm ±2 % of reading	10 min
CO (electrochemical)	0–100 ppm	< 180 s	0 to 50 °C	0.1 ppm	±5 ppm	10 min
TVOC (semiconductor)	0–60 ppm	< 90 s	0 to 40 °C	≤ 2.008 ppm: 1 ppb ≤ 11.11 ppm: 6 ppb ≤ 60 ppm: 32 ppb	±10 %	5 min
O3 (semiconductor)	0.01–2.00 ppm	< 120 s	0 to 40 °C	0.01 ppm	±10 %	10 min
PM10 (algorithm)	0–1,200 µg/m³	< 90 s	−10 to 65 °C	0.1 µg/m³	±10 µg/m³ ±5 % of reading	5 min
O2 (electrochemical)	0–30 %	< 60 s	−10 to 55 °C	0.05 %	±1 % of reading	5 min
NH3 (electrochemical)	0–100 ppm	< 60 s	−10 to 50 °C	0.01 ppm	±2 %	5 min
H2S (electrochemical)	0–100 ppm	< 60 s	−10 to 50 °C	0.01 ppm	±2 %	5 min
NO2 (electrochemical)	0–20 ppm	< 60 s	0 to 50 °C	0.01 ppm	±2 %	5 min
SO2 (electrochemical)	0–20 ppm	< 60 s	0 to 50 °C	0.01 ppm	±2 %	5 min
CH4 (semiconductor)	0–100 ppm	< 90 s	0 to 40 °C	0.1 ppm	±10 %	10 min

Channel (principle)	Range	T90	Operating temp.	Resolution	Accuracy	Equilibrium time
CH4 (catalytic)	3–100 %LEL	≤ 30 s	−20 to 55 °C	0.01 %LEL	±5 % F.S	3 min
CH4 (infrared)	0–100 %VOL	≤ 30 s	−20 to 60 °C	0.001 %VOL	±5 % of reading	3 min
PID100 (photoionization)	0–100 ppm	≤ 5 s	−10 to 60 °C	25 ppb	±2 % (reproducibility)	60 s
Noise dB	30–120 dB (20 Hz–20 kHz)	≤ 3 s	−20 to 60 °C	0.1 dB	≤ ±0.3 dB	30 s
Atmospheric pressure PR	300–1100 hPa	≤ 3 s	−40 to 85 °C	1 hPa	±1 hPa	30 s

CAUTION: Some channels have a narrower operating temperature than this unit

The operating environment of this unit is −10 to 60 °C. The following channels have a narrower operating temperature:

Operating temperature	Channels
−10 to 55 °C	O2
−20 to 55 °C	CH4 (catalytic)
−10 to 50 °C	HCHO, NH3, H2S
0 to 50 °C	CO2, CO, NO2, SO2
0 to 40 °C	TVOC, O3, CH4 (semiconductor)

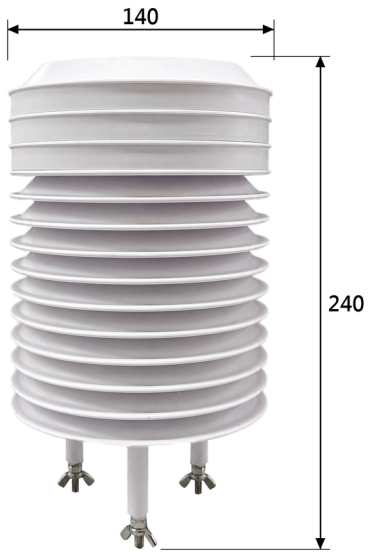
Heat Hazard Risk Levels:

With the heat index option, this unit grades the heat index into levels. The device web page shows the level name, and the level number can be read via Modbus (see Appendix A Modbus Register Table (p. 46)).

Level (Modbus reading)	Heat index (°C)	Level name	Shown on the device web page
0	< 26.7	—	No risk
1	26.7–32.2	Level 1 Caution	Caution
2	32.2–40.6	Level 2 Extreme Caution	Extreme caution
3	40.6–54.4	Level 3 Danger	Danger
4	> 54.4	Level 4 Extreme Danger	Extreme danger

Measurement specifications are based on the official catalog v1.29; dimensions and materials are as listed in this table.

Product Dimensions (mm):



PART 3.PART NAMES

Questions Answered in This Chapter

- What are the louvered radiation shield, bracket, and connector on the exterior?
- What does each of the four cable wires connect to?

Not Covered in This Chapter

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

3-1 Exterior Parts



Description:

Code	Name	Function
1	Louvered radiation shield	Louvered shield made of UV-resistant ASA; the sensors are inside
2	Mounting bracket	Stainless steel bracket fixed to a wall or post; the shield sits on top of the bracket's horizontal plate (see 4-2 Mounting Bracket and Installation (p. 20))
3	Threaded rods and wing nuts	3 rods at the bottom of the shield pass down through the horizontal plate and are fastened below the plate with wing nuts
4	Waterproof connector and cable	The waterproof connector is at the center of the shield's bottom and faces down; the cable enters the shield here. Four-core cable, 3 m long; for wire colors, see 3-2 Cable and Internal Terminals (p. 18)

3-2 Cable and Internal Terminals

This unit comes with a four-core cable 3 m long. One end is inside the shield and is connected to the sensor board terminals at the factory; the other end connects to the host system and power supply (for connections, see 4-3 Wiring (p. 22)). The end of the cable is bare wire or a quick connector, depending on the option ordered.

The Four Cable Wires:

Wire color	Connects to
Red	Power supply positive
Black	Power supply negative GND
White	RS-485 D+
Green	RS-485 D-

The wires must be connected correctly for communication to work.

Sensor Board Terminals Inside the Shield: Factory setting – do not change

Terminal	Description
+5V / GND	5 VDC power
V+ / V-	Power input (DC 9–36 V)
D+ / D-	RS-485 communication

PART 4.INSTALLATION

Questions Answered in This Chapter

- Where should it be installed, and what should be avoided?
- How do I fix the bracket and mount the shield on it?
- How do I connect the cable? After the first power-on, how long until readings are accurate?

Not Covered in This Chapter

- Names of the parts → PART 3 Part Names (p. 17)
- Web page operation after power-on → PART 5 Basic Operation (p. 24)

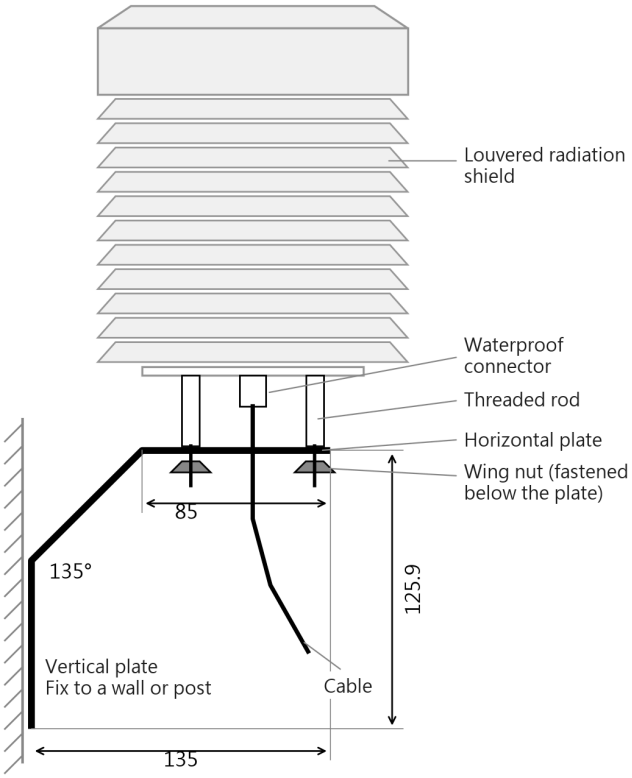
4-1 Installation Requirements

Condition	Requirement	Consequence if not met
Stay away from electrical appliances that generate heat	No heat-generating electrical appliances within 1 meter below this unit	Affects temperature and humidity accuracy
Stay away from areas of human activity	Keep this unit more than 1 meter from areas of human activity	Affects humidity
Avoid strong vibration and strong electromagnetic interference	Do not install at sites with strong vibration or strong electromagnetic interference	Product damage, ERROR indications, or measurement errors
Environments containing conductive contaminants	Where metal dust, water, and so on are present, provide suitable sealing, ventilation, or filtering	Short circuits or corrosion causing device failure
Ambient temperature and humidity	This unit −10 to 60 °C, 0–100 % (non-condensing); for the operating temperature of each channel, see 2-4 Specifications (p. 13)	Reading deviation or device failure

4-2 Mounting Bracket and Installation

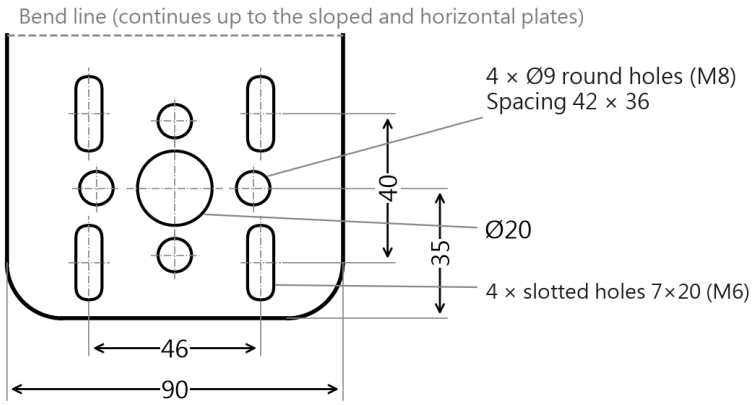
This unit uses a louvered wall-mount installation: the mounting bracket is fixed to a wall or post, the shield sits on top of the bracket's horizontal plate, and the waterproof connector and cable face down.

Installation Diagram (mm, side view, in the installed orientation):



- **The bracket is a stainless steel plate (SUS304), 90 mm wide, with two bends at an angle of 135°.**
- **Vertical plate (lower): fixed to a wall or post. Provide the screws or U-bolts to suit the site.**
- **Horizontal plate (upper): the shield sits on this plate. The large center hole lets the waterproof connector and cable pass downward; the 3 threaded rods of the shield pass through the 3 slotted holes around it (spaced 120° apart). The other small holes are not used by this unit.**

Vertical Plate Hole Layout (mm, front view):



Hole	Quantity	Size	Suitable screw
Round hole	4	Ø9	M8
Slotted hole	4	Width 7, length 20	M6

Installation Steps:

1. **Fix the vertical plate of the bracket to a wall or post, with the vertical plate below and the horizontal plate above.**
2. **Remove the wing nuts from the 3 threaded rods at the bottom of the shield.**
3. **Pass the cable downward through the large hole in the horizontal plate. Then place the shield on the horizontal plate, with the 3 threaded rods passing down through the holes in the plate.**
4. **Refit the wing nuts below the horizontal plate and tighten them. Check that the shield is secure and the waterproof connector faces down.**



Bracket



Threaded rods and waterproof connector at the bottom of the shield



Shield and bracket assembly; for cable routing, see the installation diagram

4-3 Wiring

Power off first

Never wire with the power on. After wiring, check that all connections are correct before applying power.

1. Check that the power at the host system or power supply is off.
2. Connect the four cable wires to the host system and power supply according to the table below (for wire colors, see 3-2 Cable and Internal Terminals (p. 18)).
3. Check that all connections are correct, and then apply power.

Wire color	Connects to
Red	Power supply positive (DC 9–36 V)
Black	Power supply negative GND
White	D+ of the host system RS-485
Green	D- of the host system RS-485

4-4 First Power-On

1. Connect the cable according to 4-3 Wiring (p. 22), and then apply power.
2. Connect a mobile phone to the device web page (see 5-1 Connect to the Device Web Page (p. 24)), and check the channels of this unit on the Dashboard page (see 2-3 Check Which Channels This Unit Has (p. 12)).
3. Change the login password (see 5-2 Log In and Change the Password (p. 25)).
4. Wait for the environmental equilibrium time: after power-on, and each time the unit is moved to a new measurement environment, readings stabilize only after the environmental equilibrium time (see the table below for each channel).
5. Check that the host system can read values; for communication parameters, see 6-2 RS-485 Communication Parameters (p. 33).

Environmental Equilibrium Time of Each Channel:

Channel	Environmental equilibrium time
Temperature, humidity, HCHO, CO, O3, CH4 (semiconductor)	10 minutes
PM2.5, PM10, TVOC, O2, NH3, H2S, NO2, SO2	5 minutes
CH4 (catalytic, infrared)	3 minutes
PID100	60 seconds
Noise, atmospheric pressure	30 seconds
CO2	10 seconds

PART 5.BASIC OPERATION

Questions Answered in This Chapter

- How do I connect to the device web page with a mobile phone or computer?
- How do I log in? How do I change the login password?
- What do the cards on the Dashboard page mean?

Not Covered in This Chapter

- Communication parameters and other settings → PART 6 Settings (p. 31)
- Calibration → 7-4 Calibration (p. 41)

5-1 Connect to the Device Web Page

This unit has a built-in Wi-Fi hotspot. Connect a mobile phone or computer to it to open the device web page.

1. Check that this unit is powered on.
2. In the Wi-Fi list of the mobile phone or computer, connect to the hotspot whose name begins with JNC_CW9_ (the characters that follow differ for each unit). The hotspot requires no password.
3. The device web page opens automatically after a mobile phone connects. If it does not open, open http://192.168.1.1 in a browser.
4. The connection is complete when the Dashboard page appears (see 5-3 Dashboard Page Overview (p. 26)).

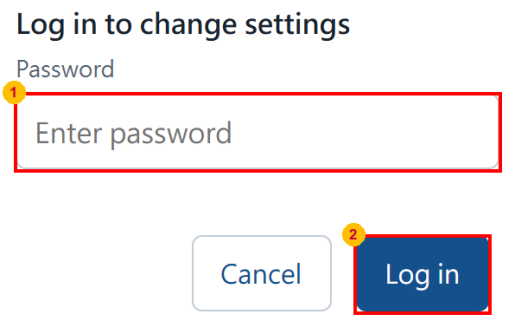
- You can view values without logging in. Log in before changing any setting (see 5-2 Log In and Change the Password (p. 25)).
- When several units are nearby, tell them apart by hotspot name. After connecting, the hotspot name of the unit appears in the upper-right corner of the web page (see 5-3 Dashboard Page Overview (p. 26) 1).

5-2 Log In and Change the Password

Log In:

1. **Tap 🔒 Log in in the upper-right corner of the web page.**
2. **Enter the password (factory default 1234), and tap Log in.**
3. **When the button changes to 🔓 Customer, you are logged in. Tap it again to log out.**

After too many incorrect password attempts, the screen shows Too many attempts, try again in N s. Wait, and then try again.



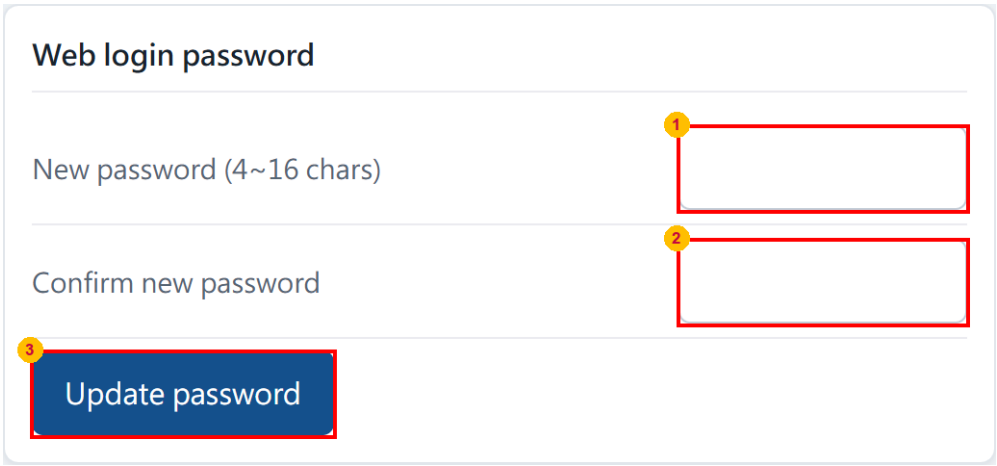
Description:

Code	Name	Function
1	Password	Enter the login password
2	Log in	Confirm the login

Change the Password:

The factory password 1234 is a publicly known default. Change it after the first connection.

Path: Settings → Web login password.



Description:

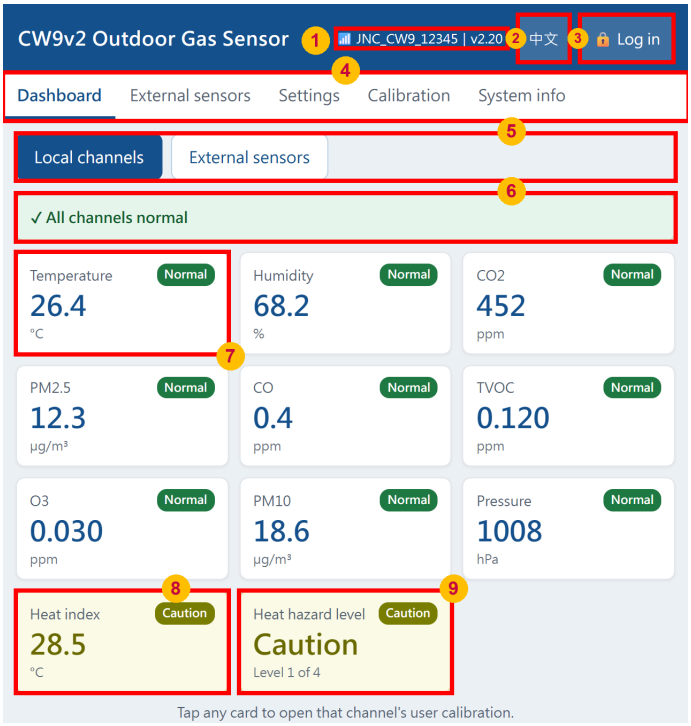
Code	Name	Function
1	New password	Enter a new password of 4–16 characters
2	Confirm new password	Enter it again; both entries must match
3	Update password	Save the new password; the screen asks you to confirm

CAUTION: A forgotten password requires a normal reset

If you forget the password, you cannot log in to the device web page. Perform a normal reset from the host system via Modbus (write 1 to address 0xFF53); the password returns to 1234. A normal reset also clears the communication parameters, alarm limits, and user calibration, and keeps the factory calibration (see 7-3 Factory Defaults and Normal Reset (p. 39)). On units with external sensors, contact JNC before performing the reset. Keep a record of the password after changing it.

5-3 Dashboard Page Overview

This is the first page after connecting to the device web page. Each enabled channel has one card, and values update about every 3 seconds.



Description:

Code	Name	Function
1	Hotspot name and firmware version	The Wi-Fi hotspot name and firmware version of this unit
2	Language	Switch between the Chinese and English interface
3	Log in	Log in and log out (see 5-2 Log In and Change the Password (p. 25))
4	Tabs	Dashboard, Settings, Calibration, System info, and other tabs
5	Local channels / External sensors	Show the channels of this unit, or the readings of external sensors set up at the factory
6	Summary	One line showing the current status: all normal, how many channels exceed an alarm limit, or how many sensors have a fault
7	Channel card	Channel name, status, real-time value, and unit. Tap a card to go directly to the calibration of that channel (see 7-4 Calibration (p. 41))
8	Heat index	Shown with the heat index option and temperature and humidity enabled; unit °C
9	Heat hazard level	Level 0–4 based on the heat index (see the heat hazard risk levels in 2-4 Specifications (p. 13))

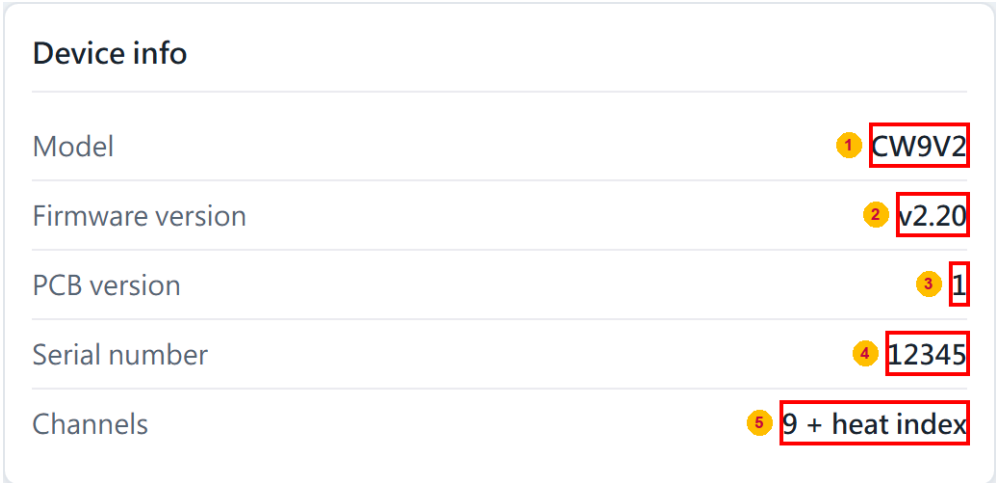
Status in the Upper-Right Corner of a Card:

Status	Meaning	Action
Normal	No enabled alarm is triggered. When alarms are not enabled, this status appears even if the reading exceeds an alarm limit (see 6-3 Alarm Limits (p. 34))	None
HI, HIHI	Alarm enabled; the reading exceeds the high limit or high-high limit, and the card changes color	Handle according to site requirements
LO, LOLO	Alarm enabled; the reading is below the low limit or low-low limit, and the card changes color	Handle according to site requirements
Fault	The sensor of this channel has a communication error, its calibration is invalid, or it is warming up. In this case the card shows only Fault, not the alarm status	Just after power-on, wait for the environmental equilibrium time first; if it persists, see 7-1 Symptoms and Checks (p. 38)

5-4 Device Info and System Info

Device Info:

Path: Settings → Device info.

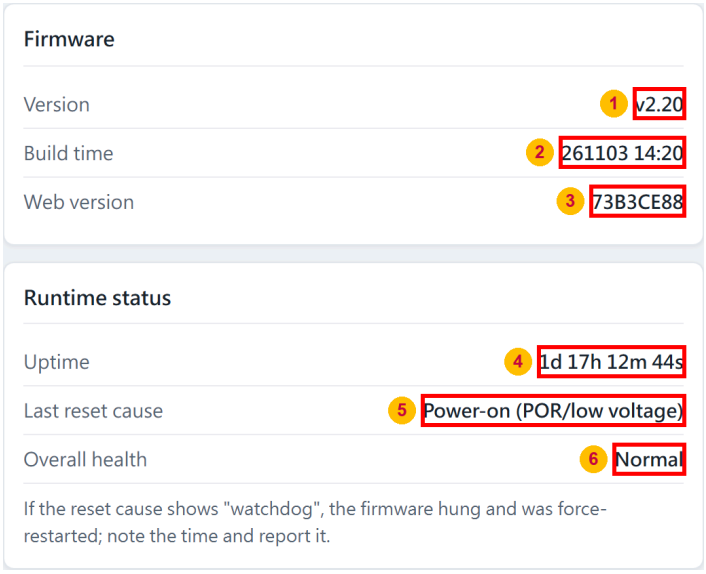


Description:

Code	Name	Function
1	Model	Model of this unit
2	Firmware version	Current firmware version of this unit
3	PCB version	Hardware version of the PCB
4	Serial number	Serial number of this unit
5	Channels	Number of channels enabled on this unit; with the heat index option and temperature and humidity enabled, + heat index is shown

System Info:

Path: System info.



Description:

Code	Name	Function
1	Version	Firmware version
2	Build time	Build date and time of the firmware
3	Web version	Version code of the web page file
4	Uptime	Time running since this startup
5	Last reset cause	Cause of the last restart (for example, power-on or software reset). Watchdog timeout means the firmware malfunctioned and was force-restarted; record the time and contact JNC
6	Overall health	Normal, Warning (channel abnormal), Fault (service required). If Fault (service required) appears, contact JNC

PART 6.SETTINGS

Questions Answered in This Chapter

- Where do I change the device name and RS-485 communication parameters?
- How do I set alarm limits?
- How do I update the firmware and web page?

Not Covered in This Chapter

- Changing the login password → 5-2 Log In and Change the Password (p. 25)
- Calibration → 7-4 Calibration (p. 41)
- Restoring defaults → 7-3 Factory Defaults and Normal Reset (p. 39)

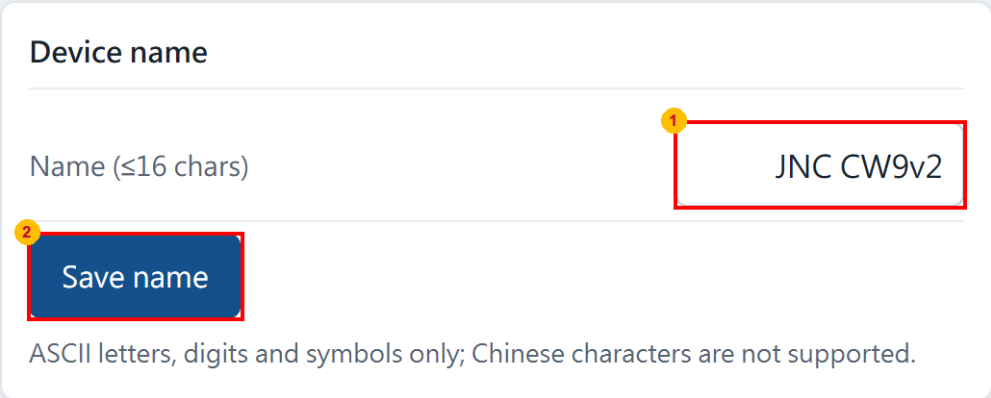
Log in before changing settings (see 5-2 Log In and Change the Password (p. 25)). Settings affect the values the host system reads and its communication with this unit, so notify other on-site personnel before making changes.

What to do	Section	Label
Name this unit	6-1 Device Name (p. 32)	
Change the slave ID, baud rate, parity, or stop bits	6-2 RS-485 Communication Parameters (p. 33)	Factory setting – do not change
Set the high-high, high, low, and low-low limits of a channel from the host system	6-3 Alarm Limits (p. 34)	
Update the firmware or web page	6-4 Firmware and Web Page Update (p. 35)	Factory setting – do not change
Change the login password	5-2 Log In and Change the Password (p. 25)	
Calibrate readings	7-4 Calibration (p. 41)	

6-1 Device Name

Give this unit a name to identify it; the host system can also read the name via Modbus (see Appendix A Modbus Register Table (p. 46)).

Path: Settings → Device name.



Description:

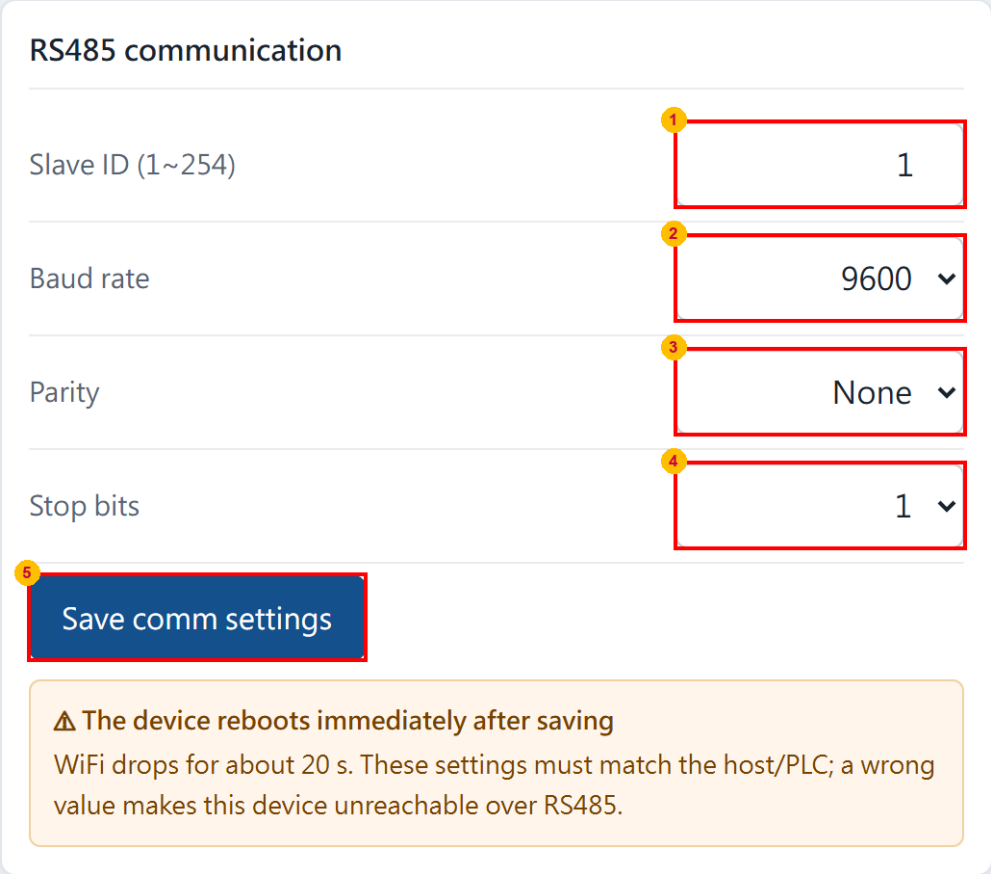
Code	Name	Function
1	Name	Up to 16 characters; letters, digits, and symbols only. Chinese is not supported. Factory default JNC CW9v2
2	Save name	Save the device name

6-2 RS-485 Communication Parameters

Factory setting – do not change

The communication parameters of this unit and the host system must match, or the host system cannot read this unit.

Path: Settings → RS485 communication.



Description:

Code	Name	Function
1	Slave ID	Range 1–254, factory default 1
2	Baud rate	1200, 2400, 9600, 19200, 38400, 57600, 115200, 230400 bps, factory default 9600
3	Parity	None, Odd, Even, factory default None
4	Stop bits	1 or 2, factory default 1
5	Save comm settings	Save the four items above; the screen asks you to confirm

Data bits are fixed at 8.

Some host systems do not accept responses from slave IDs 248–254. If your host system does not support them, use 1–247.

> **CAUTION: The device restarts immediately after saving**
>
> After you tap Save comm settings, the device restarts and Wi-Fi drops for about 20 seconds; reconnect afterward. If the communication parameters of the host system are not changed to match, it cannot read this unit.

6-3 Alarm Limits

Four alarm limits can be set for each channel. The device web page does not provide alarm settings; write them from the host system via Modbus (see Appendix A Modbus Register Table (p. 46)).

Item	Address for temperature (group 0)	What to write
Alarm limits	0x1056–0x105D	Each value occupies 2 addresses: HIHI 0x1056, 0x1057; HI 0x1058, 0x1059; LO 0x105A, 0x105B; LOLO 0x105C, 0x105D. Type FLOAT; same unit as the channel
Alarm enable	0x1022	Write the sum of the values to enable: HI = 1, HIHI = 2, LO = 4, LOLO = 8. For example, write 1 to enable HI only, 3 for HI and HIHI, or 15 (0x000F) for all four levels

Calculate the addresses of other channels from the pattern in Appendix A.

Once an alarm is enabled and the reading exceeds its limit, the card on the Dashboard page changes color and shows a status such as HI or LO; the host system can read the alarm status of each channel.

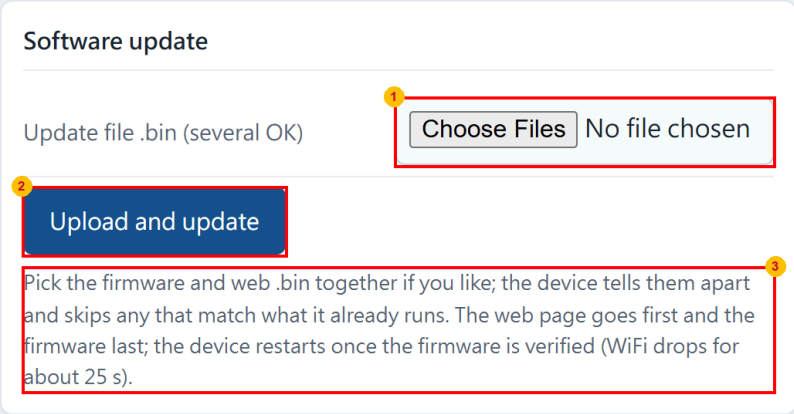
> **CAUTION: Alarm limits take effect only when enabled**
>
> All channel alarms are disabled at the factory. If you write only the alarm limits, no alarm is raised when the reading exceeds them.
>
> Check each alarm limit before enabling: LO is usually 0 at the factory, so a reading equal to 0 also triggers LO.

6-4 Firmware and Web Page Update

Factory setting – do not change

Perform this operation only when JNC provides an update file (.bin) for the firmware or web page. The firmware and web page are two separate files. You can select both at once, and the device identifies them automatically; a file with the same version as the device is skipped.

Path: Settings → Software update.



Description:

Code	Name	Function
1	Update file .bin (several OK)	Select the update files provided by JNC; after selection, the identification result of each file is listed
2	Upload and update	Start uploading; the progress appears below
3	Status text	Shows the update progress and result. After uploading, the device verifies the file and applies it only if verification succeeds; if it fails, select the file and upload again

Update Steps:

1. **Check that the update files are on the mobile phone or computer, and log in to the device web page (Upload and update can be tapped only after logging in).**
2. **In Update file .bin (several OK), tap Choose Files, and select the update files.**
3. **Tap Upload and update, and wait for the progress to finish. Do not disconnect the power during the update.**
4. **When only the web page is updated, the page reloads automatically; check the web version in System info (see 5-4 Device Info and System Info (p. 28) 3). When the firmware is updated, the device restarts automatically and Wi-Fi drops for about 25 seconds; reconnect and reload the page, and then check the firmware version in the upper-right corner of the web page (see 5-3 Dashboard Page Overview (p. 26) 1).**

PART 7.MAINTENANCE AND TROUBLESHOOTING

Questions Answered in This Chapter

- What should I check first when I see a certain symptom?
- Which conditions are not malfunctions?
- What are the factory defaults? How do I restore them?
- How do I calibrate when readings differ from a reference instrument?

Not Covered in This Chapter

- Disassembly and repair → contact JNC

7-1 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 name begins with JNC_CW9_ (see 5-1 Connect to the Device Web Page (p. 24))
2	Connected to the hotspot, but the device web page does not open	● Open http://192.168.1.1 in a browser
3	"Connection to the device lost" appears at the bottom of the web page	● Is the mobile phone still connected to this unit's hotspot? ● After saving communication parameters or a normal reset, the device restarts: wait about 20 seconds, and then reconnect ● After a firmware update, the device restarts to complete the update: wait about 25 seconds, and then reconnect
4	A channel has no card	● Was this channel ordered with the unit? (see 2-3 Check Which Channels This Unit Has (p. 12))
5	A card shows "Fault"	● Has the environmental equilibrium time passed since power-on or relocation (see 4-4 First Power-On (p. 23))? ● Still "Fault" after the environmental equilibrium time → contact JNC
6	Readings differ from a reference instrument	● Has the environmental equilibrium time passed? ● Still different → user calibration (see 7-4 Calibration (p. 41))
7	The host system cannot read this unit	● Do the slave ID, baud rate, parity, and stop bits match the host system (see 6-2 RS-485 Communication Parameters (p. 33))? ● Is the white wire connected to D+ and the green wire to D- (see 4-3 Wiring (p. 22))?
8	The login password is forgotten	● Perform a normal reset from the host system via Modbus; the password returns to 1234 (see 7-3 Factory Defaults and Normal Reset (p. 39))

#	Symptom	Check
9	The reset cause in System info shows “Watchdog timeout”	● Record the time and contact JNC (see 5-4 Device Info and System Info (p. 28))

7-2 Not a Malfunction

Symptom	Cause
Readings are unstable just after power-on	The environmental equilibrium time has not passed yet (see 4-4 First Power-On (p. 23))
Wi-Fi drops after saving communication parameters, performing a normal reset, or updating the firmware	The device is restarting. You can reconnect after about 20 seconds following a save of communication parameters or a normal reset, and after about 25 seconds following a firmware update
Some channels have no card	The channel was not ordered (see 2-3 Check Which Channels This Unit Has (p. 12))
There is no heat index card	The heat index option was not ordered, or temperature or humidity is not enabled

7-3 Factory Defaults and Normal Reset

Item	Factory default
Slave ID	1
Baud rate / parity / data bits / stop bits	9600 / None / 8 / 1
Device name	JNC CW9v2
Web login password	1234
Gain / offset	1 / 0 (not calibrated)

A normal reset returns field settings to their defaults. Use it when settings have been misconfigured or the login password is forgotten.

Cleared (returned to defaults)	Kept
RS-485 communication parameters Device name Name and decimal places of each channel Alarm limits and alarm enable User calibration (gain, offset) Web login password External sensor settings TVOC sensor (SGP30) baseline Noise period settings	Serial number Channel configuration of this unit Factory calibration

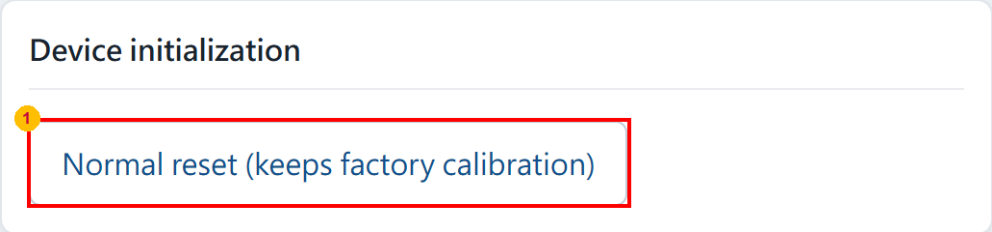
CAUTION: After a normal reset, communication parameters and calibration return to their defaults

If the communication parameters of the host system are not the factory defaults, the host system cannot read this unit after the reset. Channels with user calibration return to uncalibrated readings. For channels whose decimal places were changed, the scaling of INT16 readings changes. Record the current communication parameters and calibration values before the reset.

On units with external sensors, external sensor readings stop after the reset, and JNC must set them up again. Contact JNC before performing the reset.

Methods (choose one):

Method	Steps
Device web page	After logging in, go to Settings → Device initialization → tap Normal reset (keeps factory calibration), and confirm on the screen. If the password is forgotten, you cannot log in; perform it from the host system via Modbus
Modbus	Write 1 to address 0xFF53 (see Appendix A Modbus Register Table (p. 46))



Description:

Code	Name	Function
1	Normal reset (keeps factory calibration)	Perform a normal reset

After execution, the device restarts automatically and Wi-Fi drops for about 20 seconds. After reconnecting, log in with the password 1234.

7-4 Calibration

When readings do not agree with a reference instrument, correct them with Gain and Offset. There are three methods:

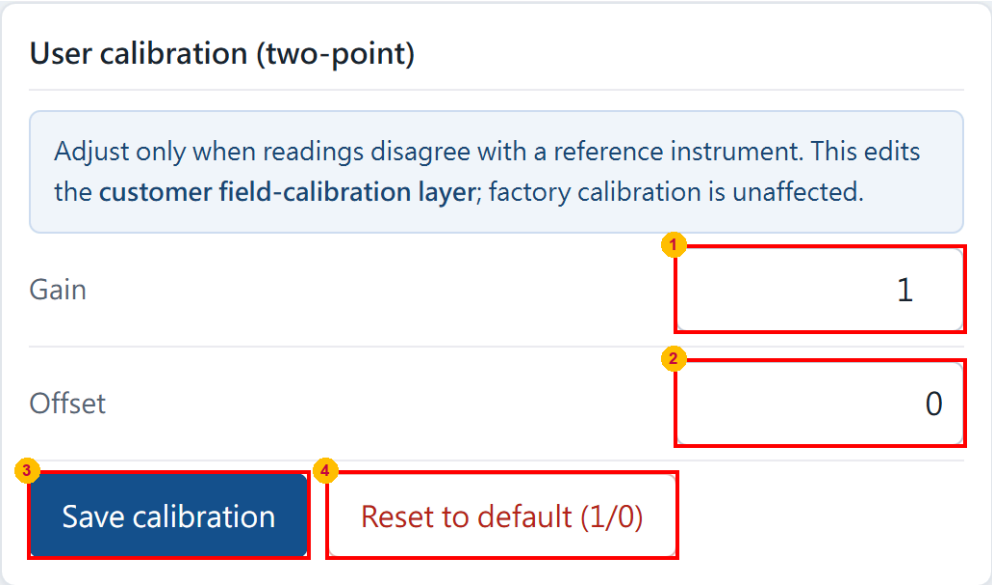
Method	When to use	What you need
Quick calibration (zero and span buttons)	Gas channels, when you have zero gas and reference gas on hand	Zero gas and reference gas of known concentration
Enter Gain and Offset directly	When corrections have been worked out against a reference instrument; use this method for non-gas channels: temperature, humidity, PM2.5, PM10, atmospheric pressure, and noise	Calculated Gain and Offset
Reset to default (1/0)	To clear the field calibration and return to the uncalibrated state	—

The first two methods both end up changing Gain and Offset:

Displayed reading = sensor value × Gain + Offset

These settings are the field calibration and do not affect JNC's factory calibration; tap Reset to default (1/0) to clear them.

Path: Calibration → Select channel → User calibration (two-point).



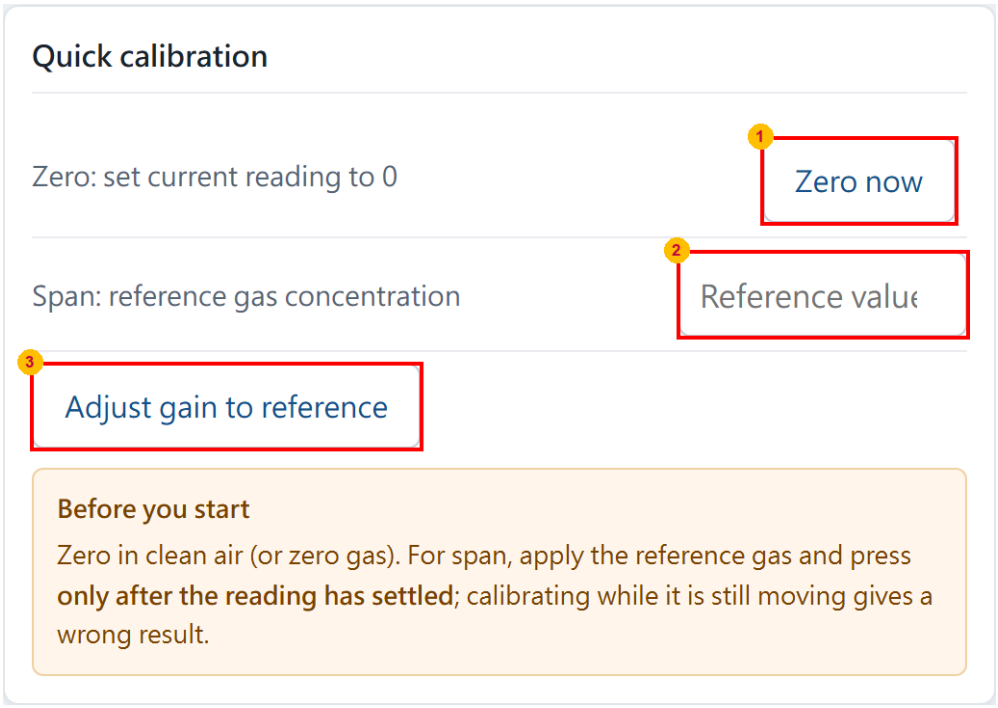
Description:

Code	Name	Function
1	Gain	Must be greater than 0.01 and less than 100; default 1
2	Offset	Same unit as the channel; default 0
3	Save calibration	Save the Gain and Offset of the selected channel
4	Reset to default (1/0)	Return Gain to 1 and Offset to 0, clearing the field calibration of this channel

Quick Calibration:

If you prefer not to calculate Gain and Offset yourself, use the following two buttons; the device calculates and writes the values.

Path: Calibration → Select channel → Quick calibration.



Description:

Code	Name	Function
1	Zero now	Adjust Offset so that the current reading becomes zero
2	Span: reference gas concentration	Enter the concentration of the reference gas
3	Adjust gain to reference	Adjust Gain so that the current reading equals the concentration entered in 2

CAUTION: Run only after the reading has stabilized

Running while the reading is still fluctuating produces an incorrect calibration. Calibration is not possible when the reading has reached the upper or lower limit of the range.

Zero now treats the current reading as 0, whichever channel is selected. O2 and CO2 are not 0 in ordinary air, so do not zero them in air. Do not use zeroing for temperature, humidity, PM2.5, PM10, atmospheric pressure, or noise.

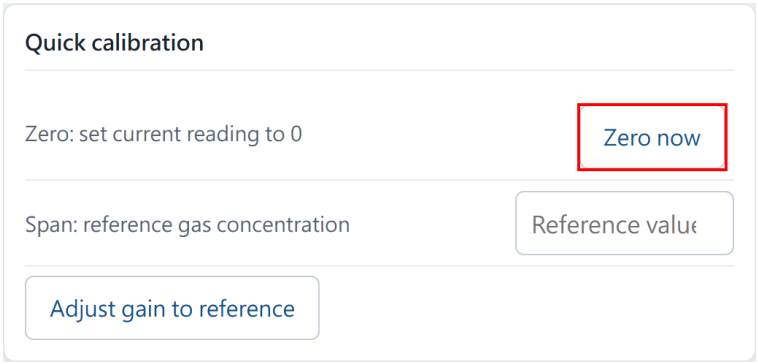
Step 1: Select the Channel

In Select channel (red box), select the gas channel to calibrate (CO in the figure below).



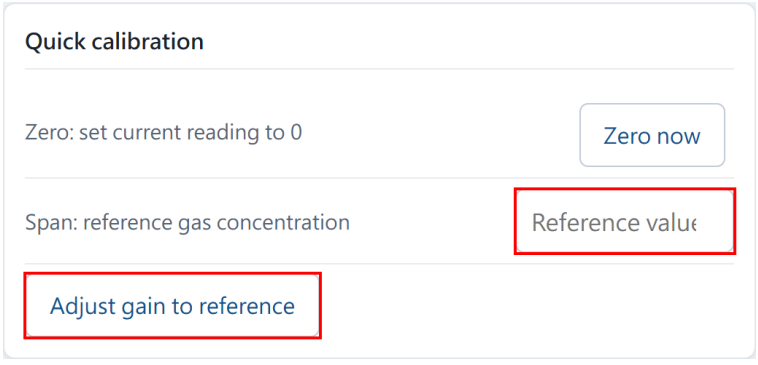
Step 2: Zero

In an environment where the actual concentration of this channel is 0 (apply zero gas), wait for the reading to stabilize, and then tap Zero now (red box).



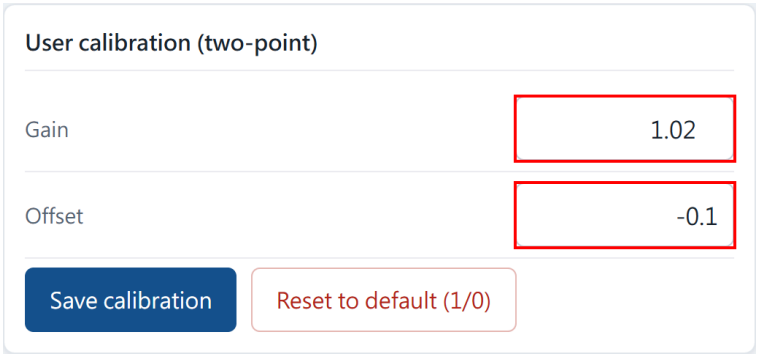
Step 3: Span

Apply the reference gas and wait for the reading to stabilize. Enter the reference gas concentration in Span: reference gas concentration, and then tap Adjust gain to reference (red boxes).



Step 4: Confirm

In User calibration (two-point), confirm that Gain and Offset (red boxes) have been updated.



APPENDIX A.MODBUS REGISTER TABLE

Who Should Read This Appendix

System engineers, when a PLC, SCADA system, 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 3-2 Cable and Internal Terminals (p. 18)
Factory defaults	Slave ID 1, 9600 bps, data bits 8, no parity (None), stop bits 1
Actual values	As set on the device web page under Settings → RS485 communication (see 6-2 RS-485 Communication Parameters (p. 33))

A-3 Register Tables

This unit has two types of registers: real-time values (Function 04 read) and setting parameters (Function 03 read, Function 06/16 write). The Register No. column = 300001 + address (Function 04) or 400001 + address (Function 03, 06, 16).

Before using the tables, note the following four 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 examples at the end of this section); to write, use Function 16 to write both addresses at once.**
- **INT16 real-time value scaling: reading ÷ 10^decimal places. The decimal places are set per channel ("Decimal places" in the channel settings table); for example, with 1 decimal place, a reading of 655 means 65.5. FLOAT readings are already actual values.**
- **Channel settings list only group 0 (temperature): calculate the addresses of other channels from the pattern above the table.**

- **Channels that are not enabled do not appear on the Dashboard page; for the enable status, see the channel enable status in the system parameters table (0x0020, 0x0021).**

Real-Time Values (Function 04 read)

Address	Register No.	Item	Type	R/W	Remarks
0x0000	300001	Temperature real-time value	INT16	R	Value/(10^decimal places) Unit: °C
0x0001	300002	Humidity real-time value	INT16	R	Value/(10^decimal places) Unit: %
0x0002	300003	CO2 real-time value	INT16	R	Value/(10^decimal places) Unit: ppm
0x0003	300004	PM2.5 real-time value	INT16	R	Value/(10^decimal places) Unit: μg/m³
0x0004	300005	HCHO real-time value	INT16	R	Value/(10^decimal places) Unit: ppm
0x0005	300006	CO real-time value	INT16	R	Value/(10^decimal places) Unit: ppm
0x0006	300007	TVOC real-time value	INT16	R	Value/(10^decimal places) Unit: ppm PID100 option is read here
0x0007	300008	O3 real-time value	INT16	R	Value/(10^decimal places) Unit: ppm
0x0008	300009	PM10 real-time value	INT16	R	Value/(10^decimal places) Unit: μg/m³
0x0009	300010	O2 real-time value	INT16	R	Value/(10^decimal places) Unit: %
0x000A	300011	NH3 real-time value	INT16	R	Value/(10^decimal places) Unit: ppm
0x000B	300012	H2S real-time value	INT16	R	Value/(10^decimal places) Unit: ppm
0x000C	300013	NO2 real-time value	INT16	R	Value/(10^decimal places) Unit: ppm
0x000D	300014	SO2 real-time value	INT16	R	Value/(10^decimal places) Unit: ppm
0x000E	300015	CH4 real-time value	INT16	R	Value/(10^decimal places) Unit: ppm (%LEL or %VOL, depending on the sensor)
0x000F	300016	Noise real-time value	INT16	R	Value/(10^decimal places) Unit: dB
0x0010	300017	Atmospheric pressure real-time value	INT16	R	Value/(10^decimal places) Unit: hPa
0x004E–0x004F	300079–300080	System uptime in seconds	ULong	R	Unit: seconds
0x0080–0x0081	300129–300130	Temperature real-time value	FLOAT	R	Unit: °C
0x0082–0x0083	300131–300132	Humidity real-time value	FLOAT	R	Unit: %
0x0084–0x0085	300133–300134	CO2 real-time value	FLOAT	R	Unit: ppm

Address	Register No.	Item	Type	R/W	Remarks
0x0086–0x0087	300135–300136	PM2.5 real-time value	FLOAT	R	Unit: μg/m³
0x0088–0x0089	300137–300138	HCHO real-time value	FLOAT	R	Unit: ppm
0x008A–0x008B	300139–300140	CO real-time value	FLOAT	R	Unit: ppm
0x008C–0x008D	300141–300142	TVOC real-time value	FLOAT	R	Unit: ppm PID100 option is read here
0x008E–0x008F	300143–300144	O3 real-time value	FLOAT	R	Unit: ppm
0x0090–0x0091	300145–300146	PM10 real-time value	FLOAT	R	Unit: μg/m³
0x0092–0x0093	300147–300148	O2 real-time value	FLOAT	R	Unit: %
0x0094–0x0095	300149–300150	NH3 real-time value	FLOAT	R	Unit: ppm
0x0096–0x0097	300151–300152	H2S real-time value	FLOAT	R	Unit: ppm
0x0098–0x0099	300153–300154	NO2 real-time value	FLOAT	R	Unit: ppm
0x009A–0x009B	300155–300156	SO2 real-time value	FLOAT	R	Unit: ppm
0x009C–0x009D	300157–300158	CH4 real-time value	FLOAT	R	Unit: ppm (%LEL or %VOL, depending on the sensor)
0x009E–0x009F	300159–300160	Noise real-time value	FLOAT	R	Unit: dB
0x00A0–0x00A1	300161–300162	Atmospheric pressure real-time value	FLOAT	R	Unit: hPa
0x01A8–0x01A9	300425–300426	Temperature real-time value (Fahrenheit)	FLOAT	R	Unit: °F
0x0220–0x0221	300545–300546	Atmospheric pressure real-time value (mmHg)	FLOAT	R	Unit: mmHg
0x0222	300547	Heat index real-time value	INT16	R	Value/10 Unit: °C
0x0223	300548	Heat hazard risk level	WORD	R	0–4 (see the heat hazard risk levels in the specifications)

Gas Concentrations Converted to mg/m³ (Function 04 read)

Address	Register No.	Item	Type	R/W	Remarks
0x0124–0x0125	300293–300294	CO2 concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x012C–0x012D	300301–300302	HCHO concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x0130–0x0131	300305–300306	CO concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x0134–0x0135	300309–300310	TVOC concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x0138–0x0139	300313–300314	O3 concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x0140–0x0141	300321–300322	O2 concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x0144–0x0145	300325–300326	NH3 concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x0148–0x0149	300329–300330	H2S concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x014C–0x014D	300333–300334	NO2 concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x0150–0x0151	300337–300338	SO2 concentration (mg/m³)	FLOAT	R	Unit: mg/m³
0x0154–0x0155	300341–300342	CH4 concentration (mg/m³)	FLOAT	R	Unit: mg/m³ Fixed at 0 when CH4 is the catalytic type (%LEL)

Alarm Status and Error Codes (Function 04 read)

Address	Register No.	Item	Type	R/W	Remarks
0x0180	300385	Temperature alarm status	WORD	R	Bit0: HI Bit1: HIHI Bit2: LO Bit3: LOLO
0x0181	300386	Humidity alarm status	WORD	R	Bit definitions same as 0x0180
0x0182	300387	CO2 alarm status	WORD	R	Bit definitions same as 0x0180
0x0183	300388	PM2.5 alarm status	WORD	R	Bit definitions same as 0x0180
0x0184	300389	HCHO alarm status	WORD	R	Bit definitions same as 0x0180
0x0185	300390	CO alarm status	WORD	R	Bit definitions same as 0x0180
0x0186	300391	TVOC alarm status	WORD	R	Bit definitions same as 0x0180
0x0187	300392	O3 alarm status	WORD	R	Bit definitions same as 0x0180
0x0188	300393	PM10 alarm status	WORD	R	Bit definitions same as 0x0180
0x0189	300394	O2 alarm status	WORD	R	Bit definitions same as 0x0180
0x018A	300395	NH3 alarm status	WORD	R	Bit definitions same as 0x0180
0x018B	300396	H2S alarm status	WORD	R	Bit definitions same as 0x0180
0x018C	300397	NO2 alarm status	WORD	R	Bit definitions same as 0x0180
0x018D	300398	SO2 alarm status	WORD	R	Bit definitions same as 0x0180
0x018E	300399	CH4 alarm status	WORD	R	Bit definitions same as 0x0180
0x018F	300400	Noise alarm status	WORD	R	Bit definitions same as 0x0180
0x0190	300401	Atmospheric pressure alarm status	WORD	R	Bit definitions same as 0x0180
0x0192	300403	Temperature error code	WORD	R	0: Normal Bit1: Communication error Bit2: Calibration invalid Bit3: Warming up
0x0193	300404	Humidity error code	WORD	R	Bit definitions same as 0x0192
0x0194	300405	CO2 error code	WORD	R	Bit definitions same as 0x0192
0x0195	300406	PM2.5 error code	WORD	R	Bit definitions same as 0x0192
0x0196	300407	HCHO error code	WORD	R	Bit definitions same as 0x0192
0x0197	300408	CO error code	WORD	R	Bit definitions same as 0x0192
0x0198	300409	TVOC error code	WORD	R	Bit definitions same as 0x0192
0x0199	300410	O3 error code	WORD	R	Bit definitions same as 0x0192
0x019A	300411	PM10 error code	WORD	R	Bit definitions same as 0x0192
0x019B	300412	O2 error code	WORD	R	Bit definitions same as 0x0192
0x019C	300413	NH3 error code	WORD	R	Bit definitions same as 0x0192
0x019D	300414	H2S error code	WORD	R	Bit definitions same as 0x0192
0x019E	300415	NO2 error code	WORD	R	Bit definitions same as 0x0192
0x019F	300416	SO2 error code	WORD	R	Bit definitions same as 0x0192
0x01A0	300417	CH4 error code	WORD	R	Bit definitions same as 0x0192
0x01A1	300418	Noise error code	WORD	R	Bit definitions same as 0x0192
0x01A2	300419	Atmospheric pressure error code	WORD	R	Bit definitions same as 0x0192
0x01A4	300421	All-channel error code summary	WORD	R	OR of the error codes of all channels; not 0 if any channel has an error

System Parameters (Function 03 read / Function 06, 16 write)

If an invalid value is written to the slave ID, baud rate, stop bits, or parity, the device ignores it and reports no error. Read the value back after writing to confirm it.

Address	Register No.	Item	Type	R/W	Remarks
0x0000–0x0002	400001–400003	Device model	WORD	R	The 3 addresses together form CW9V2; in each address, the low byte is the earlier character
0x0003	400004	Firmware version	WORD	R	Example: 0x0220 = v2.20
0x0004	400005	Serial number (low word)	WORD	R	Forms the serial number with 0x000A
0x0005	400006	Slave ID	WORD	R/W	Range: 1–254; some host systems do not accept responses from 248–254 Takes effect immediately after writing
0x0006	400007	Baud rate	WORD	R/W	0: 1200 1: 2400 2: 9600 3: 19200 4: 38400 5: 57600 6: 115200 7: 230400 Restarts automatically about 0.5 seconds after writing and then takes effect
0x0007	400008	Stop bits	WORD	R/W	1 or 2 Restarts automatically about 0.5 seconds after writing and then takes effect
0x0008	400009	Parity	WORD	R/W	0: None 1: Odd 2: Even Restarts automatically about 0.5 seconds after writing and then takes effect
0x0009	400010	Data bits	WORD	R	Fixed at 8
0x000A	400011	Serial number (high word)	WORD	R	Forms the serial number with 0x0004
0x000B	400012	PCB hardware version	WORD	R	
0x000D	400014	Number of channels	WORD	R	Fixed at 18 (channel 18 is reserved)
0x000E–0x0015	400015–400022	Device name	WORD	R/W	Up to 16 ASCII characters, 2 characters per address (the high byte is the earlier character); Chinese is not supported

Address	Register No.	Item	Type	R/W	Remarks
0x0020	400033	Channel enable status (low word)	WORD	R	1 = enabled Bit0: Temperature Bit1: Humidity Bit2: CO2 Bit3: PM2.5 Bit4: HCHO Bit5: CO Bit6: TVOC Bit7: O3 Bit8: PM10 Bit9: O2 Bit10: NH3 Bit11: H2S Bit12: NO2 Bit13: SO2 Bit14: CH4 Bit15: Noise
0x0021	400034	Channel enable status (high word)	WORD	R	Bit0: Atmospheric pressure Bit14: Heat index readable Bit15: Heat index option installed
0xFF56	465367	Device health status	WORD	R	0: Normal 1: Warning 2: Fault

Channel Settings (Function 03 read / Function 06, 16 write)

The table below gives the addresses for temperature (group 0). Each channel group is offset by 0x0100, in this order: 0 temperature, 1 humidity, 2 CO2, 3 PM2.5, 4 HCHO, 5 CO, 6 TVOC, 7 O3, 8 PM10, 9 O2, 10 NH3, 11 H2S, 12 NO2, 13 SO2, 14 CH4, 15 noise, 16 atmospheric pressure (for example, the Gain address of CO2 = 0x1050 + 0x0200 = 0x1250).

Address	Register No.	Item	Type	R/W	Remarks
0x1000–0x1007	404097–404104	Channel name	WORD	R/W	Up to 16 ASCII characters, 2 characters per address (the high byte is the earlier character)
0x1008–0x100B	404105–404108	Unit	WORD	R/W	Up to 8 bytes, UTF-8
0x1021	404130	Decimal places	WORD	R/W	0–3; determines the scaling of the INT16 real-time value
0x1022	404131	Alarm enable	WORD	R/W	Each bit: 1 = enabled Bit0: HI Bit1: HIHI Bit2: LO Bit3: LOLO All four levels: 0x000F
0x1050–0x1051	404177–404178	Gain	FLOAT	R/W	Default 1.0
0x1052–0x1053	404179–404180	Offset	FLOAT	R/W	Default 0.0
0x1056–0x1057	404183–404184	HIHI high-high limit	FLOAT	R/W	Same unit as the channel

Address	Register No.	Item	Type	R/W	Remarks
0x1058–0x1059	404185–404186	HI high limit	FLOAT	R/W	Same unit as the channel
0x105A–0x105B	404187–404188	LO low limit	FLOAT	R/W	Same unit as the channel
0x105C–0x105D	404189–404190	LOLO low-low limit	FLOAT	R/W	Same unit as the channel
0x1062–0x1063	404195–404196	Alarm deadband	FLOAT	R/W	To clear an alarm, the reading must return to within the limit ± deadband; same unit as the channel

System Commands (Function 06 write)

Address	Register No.	Item	Type	R/W	Remarks
0xFF52	465363	Restart	—	W	Write any value; restarts after about 0.5 seconds
0xFF53	465364	Normal reset	—	W	Write 1 (for items cleared and kept, see 7-3 Factory Defaults and Normal Reset (p. 39))

Read Examples

In the following examples, the slave ID is always 01, and the CRC is the Modbus RTU 16-bit check code (low byte first).

Example 1: Read the humidity real-time value (Function 04, INT16)

Master request:

Slave ID	Function code	Start address	Quantity (words)	CRC
01	04	00 01	00 01	60 0A

Slave response:

Slave ID	Function code	Byte count	Data	CRC
01	04	02	02 8F	F9 F4

Data 0x028F = 655. With 1 decimal place for humidity, the humidity (RH) real-time value is 655 ÷ 10 = 65.5 %.

Example 2: Read the humidity real-time value (Function 04, FLOAT)

Master request:

Slave ID	Function code	Start address	Quantity (words)	CRC
01	04	00 82	00 02	D1 E3

Slave response:

Slave ID	Function code	Byte count	Data	CRC
01	04	04	28 F6 42 83	63 17

The first 2 data bytes, 28 F6, are the low word (address 0x0082), and the last 2 bytes, 42 83, are the high word (address 0x0083). Placing the high word first gives 42 83 28 F6, which converts as FLOAT to 65.58, so the humidity (RH) real-time value is 65.58 %.

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

Revision History

Version	Revision date	Revision description	Maintenance personnel
V1.08	2023/08/18	Update new format	Siao jǐng jhou
V1.09	2024/01/09	Modbus Table modification	Siao jǐng jhou
V1.10	2024/01/15	Added heat index related and AI channel settings	Siao jǐng jhou
V1.13	2026/11/05	Rewritten for device web page operation with firmware v2.20; errors corrected	Ran

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