Wireless CO2/Temperature/Humidity Environment Sensor

User Manual

Table of Content

1. Introduction

RA0715_R72615_RA0715Y is a ClassA type device based on the LoRaWAN open protocol of Netvox and is compatible with the LoRaWAN protocol. RA0715_R72615_RA0715Y is unmasked for indoor inspection. RA0715_R72615_RA0715Y can be connected to a variety of sensors.

A variety of sensor combinations are required.

As detectors for CO_2, temperature and humidity, the values collected by the sensor are reported to the corresponding gateway.

LoRa Wireless Technology:

LoRa is a wireless communication technology dedicated to long distance and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, industrial monitoring. Main features include small size, low power consumption, transmission distance, anti-interference ability and so on.

LoRaWAN:

LoRaWAN uses LoRa technology to define end-to-end standard specifications to ensure interoperability between devices and gateways from different manufacturers.
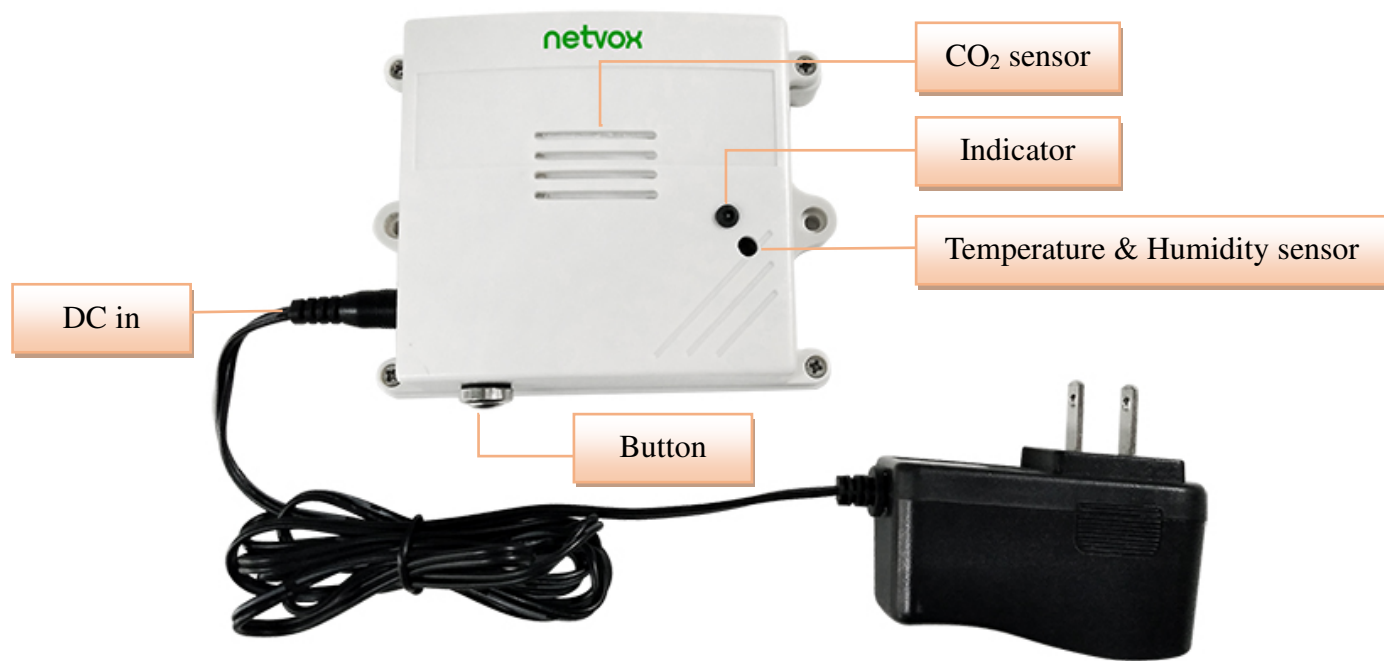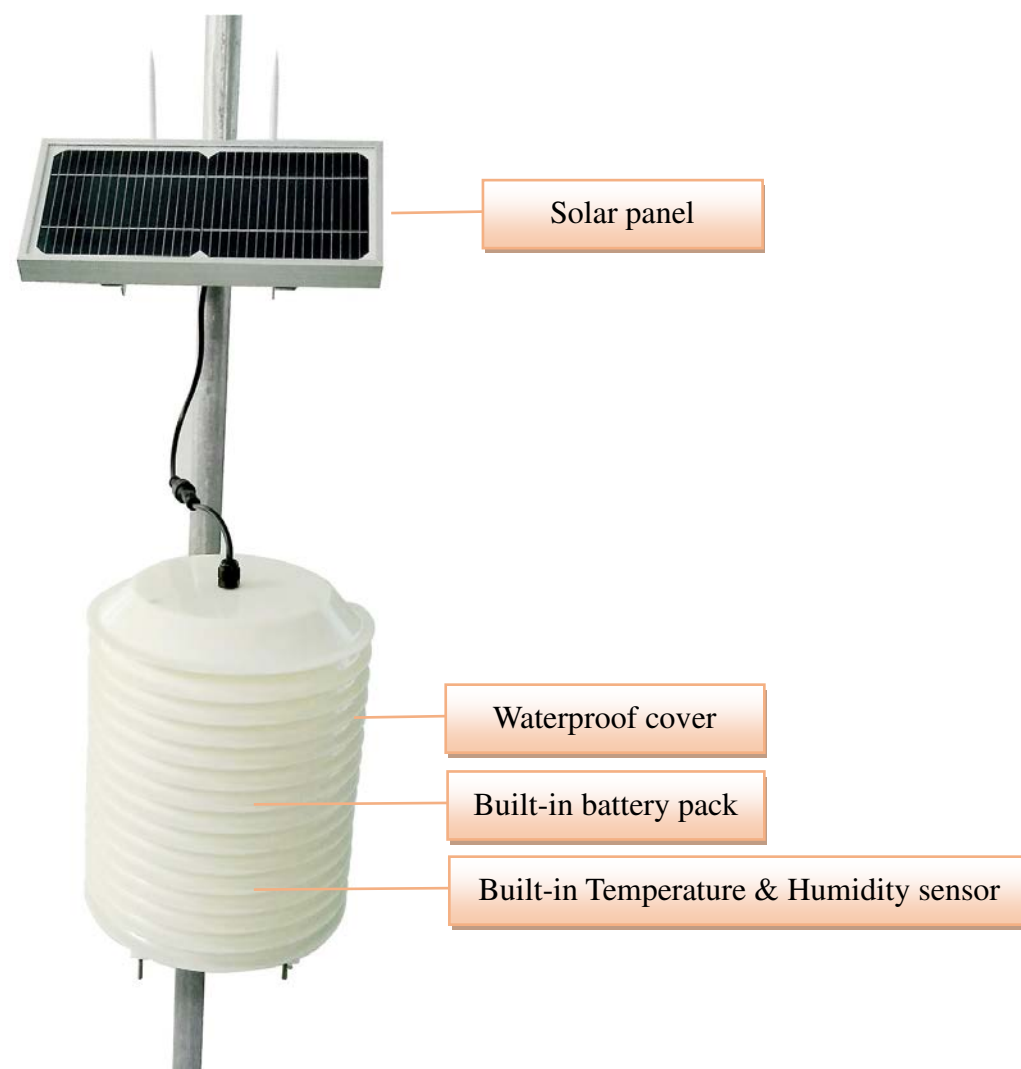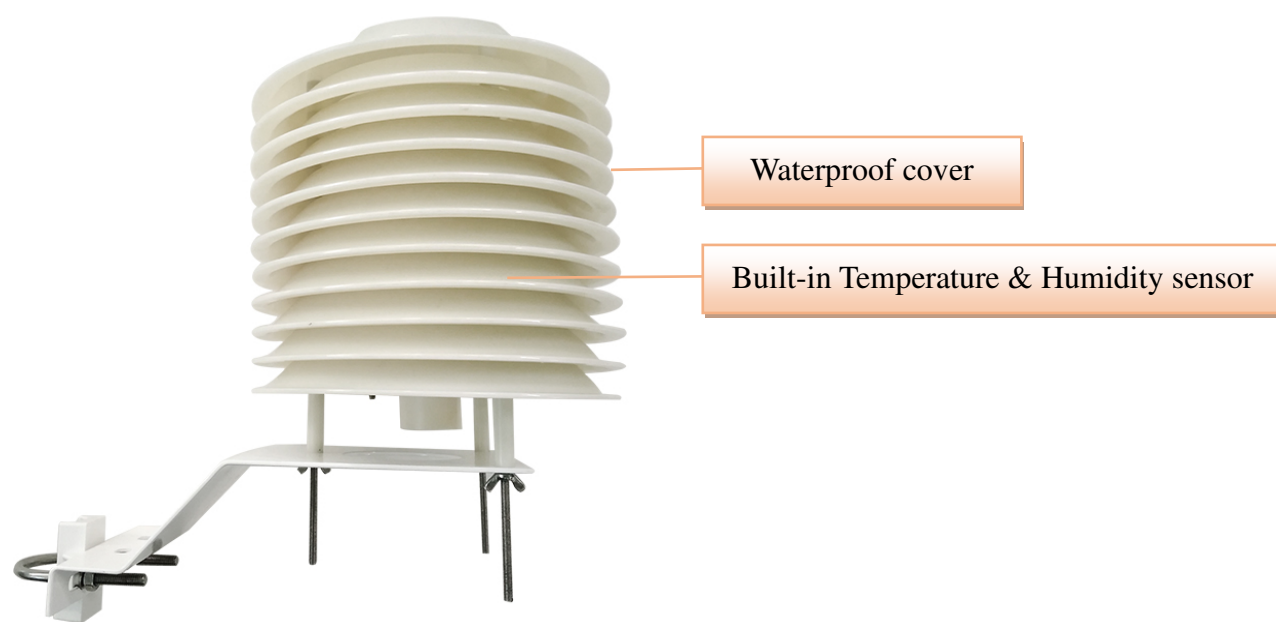
2. Appearance

Fig.1. RA0715

Fig.2. R72615

Fig.3. RA0715Y

3. Main Features

- Compatible with LoRaWAN
- RA0715 and RA0715Y applies DC 12V adapters
- R72615 applies solar and rechargeable lithium batteries
- Simple operation and setting
- CO_2 detection
- Adopt SX1276 wireless communication module

4.Set up Instruction

On/Off

Power on	RA0715 and RA0715Y are connected to the DC 12V adapter for power-on; R72615 applies solar and rechargeable lithium batteries.
Turn on	Power on to turn on.
Restore to factory setting	Press and hold the function key for 5 seconds till green indicator flashes for 20 times.
Power off	Remove power
Note:	1. Engineering test modes require the program engineering test software. 2. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.

Network Joining

Never joined the network (Or at factory setting)	Turn on the device to search the network. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Had joined the network (Not at factory setting.)	Turn on the device to search the previous network. The green indicator stays on for 5 seconds: success The green indicator remains off: fail

	First two mins: wake up every 15 seconds to send request.
	After two mins: enter sleeping mode and wake up every 15 minutes to send request.
Fail to join the network (when the device is on)	
	Note: Suggest to remove batteries if the device is not used to save power.
	Suggest to check the device verification information on the gateway
	or consult your platform server provider.

Function Key

Press and hold for 5 seconds	Restore to factory setting / Turn off
	The green indicator flashes for 20 times: success
	The green indicator remains off: fail
Press once	The device is in the network: the green indicator flashes once and the device sends a data report
	The device is not in the network: green indicator remains off

Low Voltage Threshold

Low Voltage Threshold	10.5 V

Threshold Restore to Factory Setting

Description	RA0715_R72615_RA0715Y has the power-down save network information memory function. This feature is turned off by default, that is, it will be re-joined every time it is powered back on. It can be turned on by the ResumeNetOnOff command. At this time, each time the power is rewritten, the last networking information will be recorded (including saving the network address information assigned to it, etc., if users want to join a new network, they need to perform a factory reset operation before that.), will not re-join.
Operation	1. Press and hold the binding button for 5 seconds to release (release the binding button when the LED flashes), and the LED flashes 20 times. 2. The device automatically restarts to start re-join.

5. Data Report

The device will immediately send a version packet report along with an uplink packet including temperature, humidity, voltage and CO_2 value. The device sends data in the default configuration before any configuration is done.

ReportMaxTime:

        RA0715 / RA0715Y is 180s

        R72615 is 900s (subject to factory settings)

        Value must be greater than *ReportMinTime* $\geqq$ *ReportType count* *ReportMinTime + 10* ,units: seconds

ReportMinTime: 30s;

ReportChange: 0;

ReportType count = 2;

Note:

    (1) The device report interval will be programmed base on the default firmware which may vary.

    (2) The interval between two reports must be the Maxtime

    (3) ReportChange is not supported by RA0715_R72615_RA0715Y (Invalid configuration)

    (4) Report cycle will be based on ReportMaxTime period when sending data packet (beginning to the end of the first data as a period).

    (5) Data packet: temperature,humidity, voltage and CO_2

    (6) It would take about 35 seconds for the CO_2 sensor to sample and process the collected CO_2 value after being powered

    (7) The device also supports Cayenne's TxPeriod cycle configuration instructions. Therefore, the device can also perform a report according to the cycle time of the TxPeriod value; and whether the report period is ReportMaxTime or TxPeriod will be depending on which cycle time is configured last time;

    (8) It would take about 35 seconds for the CO_2 sensor to sample and process the collected CO_2 value if you were to manually trigger the device by pressing the button, please be patient.

The device reported data parsing please refer to

Netvox LoraWAN Application Command document and *Netvox Lora Command Resolver* http://www.netvox.com.cn:8888/page/index

Report Configuration

Description	Device	CmdID	DeviceType	NetvoxPayLoadData		
ConfigReport Req	RA07 Series/ R726 Series/ RA07**Y Series	0x01	0x05/ 0x09/ 0x0D	MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Reserved (5Bytes,Fixed 0x00)
ConfigReport Rsp		0x81		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)	
ReadConfig ReportReq		0x02		Reserved (9Bytes,Fixed 0x00)		
ReadConfig ReportRsp		0x82		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Reserved (5Bytes,Fixed 0x00)

(1) Configure **RA0715** device parameters MinTime = 30s, MaxTime = 120s (120>30*1+10)
   Downlink: 0105001E00780000000000
   Device returns:
       81050000000000000000000 (configuration is successful)
       81050100000000000000000 (configuration failed)

(2) Read **RA0715** device parameters
   Downlink: 0205000000000000000000
   Device returns:
       8205001E00780000000000 (device current parameter)

6. Installation

1. **The RA0715** does not have a waterproof function. After the network joining is completed, please place it indoor.
   Please pay attention to the direction when installing the sensor, keep the pickup ring facing down.

2. **The R72615** product is waterproof. After the network-joining is completed, please leave it outdoors.

(1) In the position to be installed, loosen the U-shaped screw of the bottom of the R72615 and the mating washer nut, and fix the U-shaped screw
   through the appropriate size cylinder on the R72615 fixed strut piece. Install the washer nut in order, lock the nut till R72615 body is stable and does
   not shake.
(2) At the upper side of the fixed position of R72615, loosen the two U-shaped screws on the side of the solar panel and the mating washer nut.
   Fix the U-shaped screw through the appropriate size cylinder on the main bracket of the solar panel, and install the gasket in sequence. Lock nut till
   the solar panel is stable and does not shake.
(3) Adjust the angle of the solar panel. After the adjustment is completed, lock the nut.
(4) Connect the R72615 top waterproof cable to the solar panel wiring and lock it tight.
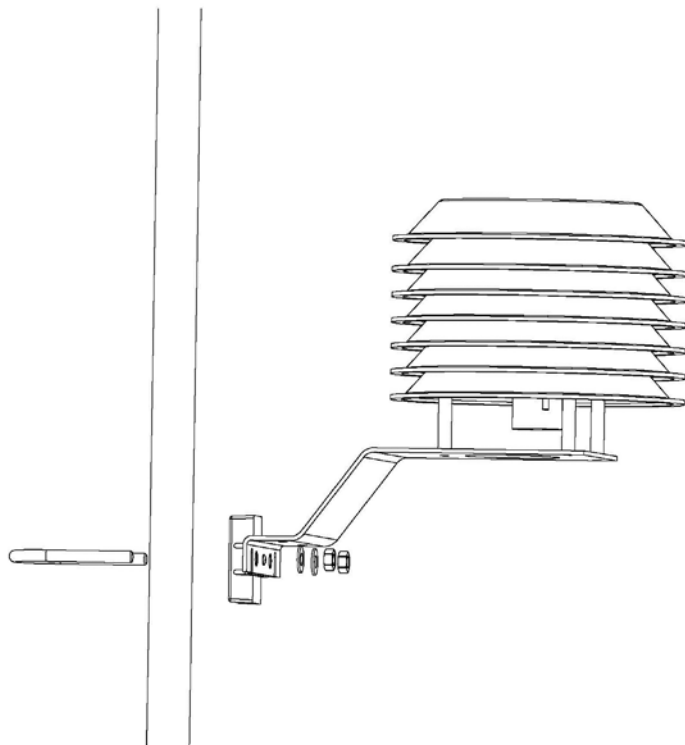
(5) R72615 has a battery pack inside, users can buy and install rechargeable 18650 lithium battery, a total of 3 sections, a single rechargeable lithium \
battery voltage 3.7V, capacity recommended 5000mah, the installation of rechargeable lithium battery steps are as follows:

    1: Remove the four screws around battery cover
    2: Insert three 18650 lithium batteries.   (Please make sure the battery positive and negative)
    3: Press the activation button on the battery pack for the first time.
    4: After activation, close the battery cover and lock the screws around battery cover.

3. **The RA0715Y** product is waterproof and can be placed outdoors after the network-joining is completed.
(1) In the position to be installed, loosen the bottom U-shaped screw of the RA0715Y and the mating washer nut, and fix the U-shaped screw through the appropriate size cylinder on the RA0715Y fixed strut piece. Install the washer nut in order, lock the nut till RA0715Y body is stable and does not shake.
(2) Loosen the M5 nut at the bottom of the RA0715Y matte and take the matte together with the screw.
(3) Plug the DC adaptor from the center through hole of the RA0715Y bottom cover, insert it into the RA0715Y DC socket, and then return the mating screw to the original position and lock the M5 nut tight.
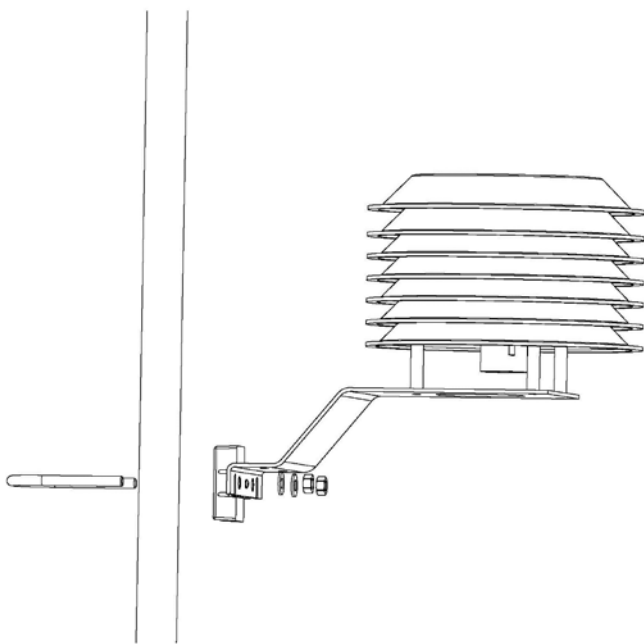
7. Important Maintenance Instruction

Your device is a product of superior design and craftsmanship and should be used with care.
The following suggestions will help you use the warranty service effectively.

• Keep the equipment dry. Rain, moisture, and various liquids or moisture may contain minerals that can corrode electronic circuits. In case the device is wet, please dry it completely.
• Do not use or store in dusty or dirty areas. This can damage its detachable parts and electronic components.
• Do not store in excessive heat. High temperatures can shorten the life of electronic devices,destroy batteries, and deform or melt some plastic parts.
• Do not store in excessive cold place. Otherwise, when the temperature rises to normal temperature,moisture will form inside, which will destroy the board.
• Do not throw, knock or shake the device. Rough handling of equipment can destroy internal circuit boards and delicate structures.
• Do not wash with strong chemicals, detergents or strong detergents.
• Do not apply with paint. Smudges can block debris in detachable parts and affect normal operation.
• Do not throw the battery into a fire to prevent the battery from exploding. Damaged batteries may also explode.

All of the above suggestions apply equally to your device, battery and accessories.
If any device is not working properly.
Please take it to the nearest authorized service facility for repair.

DIREKTRONIK

Direktronik AB tel. 08-52 400 700 www.direktronik.se