Please read the user manual before using the product

RH570 Wireless Data Collector

User Manual

Version number：VER 1.0

Date of publication: 2023.04

Attention：

* Before installation and use, read the operating instructions, and install and operate in strict accordance with the methods in the instructions

* Do not modify the circuit without authorization

* The model, specification and electrical parameters of associated short circuit and components shall not be modified during maintenance

* It is forbidden to install antennas in explosion-proof places

Chapter I Product Introduction

1.1 Features

RH570 wireless data collector is a new generation wireless product of the company, which has rich wireless data transmission functions. It can be applied to a variety of application scenarios by configuring different modules, and has wired data transmission functions. With different wireless sensors and monitoring sensors of our company as the monitoring system, it integrates continuous acquisition, calculation, storage and transmission, and can be flexibly adapted to equipment status monitoring in various occasions such as petrochemical, steel, cement, coal, etc.

Based on the access monitoring requirements of different on-site wireless sensors and different live trigger modes, RH570 can be designed to meet different on-site equipment monitoring needs and achieve accurate, and real-time monitoring. RH570 supports both power supply and battery-powered, enabling all-wireless deployment.

It has the following main characteristics:

●It has network interface, 4G, WIFI, Zigbee, LoRa and other communication modes to provide options, which can meet the needs of various network environments on site；

●It can be used in combination with Ronds single-axis vibration, three-axis vibration and other types of wireless sensors to meet the monitoring mode requirements of different measuring points；

●The machine learning classification algorithm can be used to effectively divide the startup and shutdown status of various types of equipment to achieve fully automatic equipment startup and shutdown status recognition；

●With edge intelligent alarm, rich alarm indicator system, adaptive threshold calculation, and hierarchical alarm output according to fault severity；

●The alarm data can be uploaded in time according to the severity of the equipment failure to meet the requirements of rapid deterioration equipment care；

●With data timing alignment upload, improve the requirements of intelligent diagnosis and care, and avoid timing deviation and other problems of data at different acquisition locations。

1.2 Product model

Product name：Wireless Data Collector

Product model:RH570

Function description: RH570 is the product model of this series of data collector, with the following communication modes:

Uplink communication mode: 4G, WIFI and network interface communication; Downlink communication is Zigbee and LoRa communication, with industrial interface RS485 and CAN communication.

1.3 Technical parameter table

Power supply		
Power supply	AC100V-AC240V（50/60Hz）	
Basic parameters		
CPU1 main frequency	1.0GHz single core	Standard configuration
CPU1 storage	Internal storage: RAM：128MB DDR2 External storage: standard configuration EMMC：8~128GB optional	Standard configuration
CPU2 main frequency	96-192MHz single core	Standard configuration
CPU2 storage	Internal storage:	Standard configuration

	RAM：928KB RAM External storage: PSRAM：64Mbit/128Mbit EMMC：8~128GB optional	
Key performance		
Industrial communication interface	RS485：1 channel CAN：1channel	Optional
Communication mode with server	WIFI：2.4G	Optional 2.4G WiFi and 4G cannot be transmitted at the same time
	All-network communication 4G：LTE-FDD/LTE-TDD/LTE-TDD1.8G，APN configurable	
	RJ45 network interface：10/100Base-TX	
Communication mode with sensor	Zigbee: 2.4GHz IEEE 802.15.4 Lora: 915MHz（optional）	
Communication distance with sensor	Zigbee：300m line of sight Lora：1.5Km line of sight	
Maximum number of supported sensors	Zigbee：60pcs LoRa：255pcs	
Edge computing	Support	
Product upgrade method		
Handheld Debugger Upgrade	Support the upgrade of Ronds debugger	
PC upgrade	Upgrade via USB to zigbee	
Remote firmware upgrade	Remote upgrade via upper computer	
Structural parameters		
Dimensions	260mm*203mm*87mm	long × wide × high
Weight	2.5kg	
IP Grade	IP66	
Shell material	Cast aluminium	
Environmental parameters		
Ambient environment	-40℃～70℃，≤95%RH，non-condensing	
Storage environment	-50~85℃，≤95%RH，non-condensing	
Atmospheric pressure	70kPa ~110kPa	
Reliability parameters		
ESD immunity	EN61000-4-2 Test level: 4 Test voltage： ±8kV（Contact discharge）	

	±15kV（Air discharge）	
Power frequency withstand voltage level	500VAC	
Insulation resistance	Metal grounding of main body shell, insulation resistance of non-metal antenna shell＞1GΩ	

1.4 Performance description

1.4.1 Power performance

Wireless intelligent data collector power supply voltage： AC100V-AC240V/（50/60Hz）.

1.4.2 Wire communication

The data collector has a variety of wired communication modes, including Ethernet, RS485 and CAN.

1.4.3 Wireless communication

The data collector has a variety of wireless communication modes, including ZigBee, LoRa, WIFI, 4G, and the corresponding antenna is used as needed.

1.5 Wireless parameters

1.5.1 WiFi

a）Operating frequency：2400MHz~2485MHz

b）Modulation mode：IEEE 802.11b/g/n

c）Output power：≤28.5dBm（Including antenna gain 11dBi）；

1.5.2 ZigBee

a）Number of channels: 2 channels (receiving)

b）Operating frequency：2405MHz~2485MHz

c）Modulation mode：IEEE 802.15.4

d）Output power：≤11dBm(Including antenna gain 5dBi)；

1.5.3 ZigBee

a）Number of channels: 1 channel (sending)

b）Operating frequency：2405MHz~2485MHz

c）Modulation mode：IEEE 802.15.4

d）Output power：≤24dBm(Including antenna gain 5dBi)；

1.5.4 LORA

a）Operating frequency：915MHz

b）Modulation mode：LoRa modulation mode is supported

c）Output power：≤20dBm(Including antenna gain 6dBi)；

1.5.5 4G

a）Operating frequency：

LTE-TDD: B1/B3/B7/B8/B20/B28

LTE-TDD: B38/B40

b）Modulation mode：LTE TDD、LTE FDD

c）Output power：≤30dBm（Including antenna gain 5dBi）；

1.6、RF antenna

Antenna type	Model	Gain	Manufacture
Zigbee antenna	TQJ-2400D	5dBi	Kenbotong Technology Co.,Ltd.
Lora antenna	TQJ-900AT6	6dBi	Kenbotong Technology Co.,Ltd.
Wifi antenna	TDJ-2400BKC90-VB1	11dBi	Kenbotong Technology Co.,Ltd.
4G antenna	AMXF-8027-5	3/5dBi	Aimeixun Co.,Ltd.

Chapter II Usage Introduction

2.1 installation

（1）Product lead-in device: the installation position of gland is shown in the figure below, and the number of gland: 2; Model: SH-BDM-1.

Fig. 1 Installation position of gland

（2）Set the switch on the power board to "OFF" before installation；

（3）The allowable power line diameter of the gland is Ø 5.5~Ø 12mm. It is introduced from the gland marked with "PWR" at the bottom. It is connected to the terminal according to the live line, zero line and ground line marked on the power interface on the power board, and locked with a screwdriver. The installation torque is 0.1 ± 0.02N. m; Then use the tool to lock the gland, and the installation torque is 0.6 ± 0.05N. m；

（4）The network cable is introduced from the gland marked with "NET", and then the crystal base is crimped, connected to the corresponding communication module interface, and the gland is locked at the same time. The installation torque is 0.6 ± 0.05N. m.

（5）Antenna: the top of the shell is marked with the position screen of each antenna. Install the antenna according to the identification and tighten it with tools. The installation torque is 0.6 ± 0.05N. m to ensure that it will not be unscrewed by hand. The bottom 4G/WIFI antenna is connected through the RF feed line. The antenna is installed vertically upwards. The RF feed line model is RG213/U (4G&WIFI), and the installation torque is 0.6 ± 0.05N. m. The following figure shows the installation direction of acquisition station and antenna：

Fig. 2 Installation diagram of acquisition station and zigbee and Lora antennas

Fig. 3 4G antenna installation diagram

Fig.4 Wifi antenna installation diagram

（6）Connect the external grounding, the cross sectional area of the grounding wire shall not be less than 4mm2, and the grounding wire shall be installed on the bolt marked with the grounding mark at the bottom of the shell, with the installation torque of 0.6 ± 0.05N. m.

（7）After installation, put the main board switch in the "ON" state. After powering on, check the housing indicator. The indicator light RUN lights up to indicate that it is powered on, and the COM flashes to indicate that the communication is normal.

Attention:

The interface between 4G antenna and WIFI antenna is a standard N-type connector, which needs to be installed by professionals. Consumers should not install it by themselves.

2.2 Precautions for operation

(1) Before installing the instrument, please ensure that you can provide a suitable working environment and sufficient physical space. After the instrument is in place, it is fixed by hanging lugs and screws. The installation method is vertical installation.

(2) The antenna shell of the product is made of plastic material, which has potential electrostatic charge hazard. Avoid friction. Please wipe it with wet cloth when cleaning. It is forbidden to install the antenna in explosion-proof places.

(3) This instrument needs to be used and maintained by personnel trained for a certain time or special personnel.
(4) The use of the instrument should be avoided as far as possible: knocking, falling, long time close to high temperature source and long time use in high corrosive environment, so as not to affect the performance of the instrument.
(5) During the use and maintenance of this product, the model, specification and parameters of the structure and components related to the explosion-proof performance shall not be changed. The transformation of explosion-proof products can only be carried out by the product manufacturer and can only be used after passing the inspection by a qualified inspection agency.
(6) The user of the product shall not change the associated equipment and matching equipment of the explosion-proof product at will, otherwise the explosion-proof performance of the product will be changed, resulting in the loss of explosion of the product.
(7) The shell of the intrinsically safe wireless monitoring station is made of aluminum alloy. During installation and use, the ignition hazard caused by impact or friction shall be prevented.
(8) During product installation, the shell must be reliably grounded, and the grounding wire shall not be less than $4mm^2$

2.3 Repair

（1）Please read the manual carefully before use and follow the operating steps.
（2）2)Do not change any parameters of the data collector circuit.
（3）Battery replacement shall be carried out in a safe place.

2.4 Maintenance

（1）A designated person must be responsible for the daily maintenance of the sensor.
（2）Maintenance personnel must carefully read and be familiar with *Wireless Data Collector User Manual* and relevant circuit diagrams, and be familiar with the internal and external structure and circuit principle of the sensor.
（3）During use, maintenance and service personnel should always check whether the sealing part of the data collector is tight and whether the screws are tight.

2.5 Transportation and Storage

（1）Avoid violent vibration and impact when transporting and handling the data collector.

（2）Strictly prohibited to put the data collector in the place directly dripping with water when store it.

2.6 Unpacking and Inspection

（1）Pay attention to safety when unpacking to avoid damage to equipment or injury.

（2）After unpacking, check whether the appearance of the equipment is damaged and whether the accessories are complete.

（3）Accessories list

a) Instruction Manual 1 pcs

b) Data collector 1 pcs

c) Product certificate 1 pcs

d) Packing list 1 pcs

Manufacturer：Anhui Ronds Science & Technology Incorporated Company

Address：#59 Branch Road of Biomedical park, High-tech district, Hefei, Anhui, China

Postcode：230000

Telephone：4008551298

FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help important announcement

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.