

H2100-R Series RTU User Manual

V3.0



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1. Product Introduction

1.1 Overview

The H2100-R series is an ultra-low-power, compact, and lightweight intelligent RTU (Remote Terminal Unit). It collects data from external sensors via RS485, RS232, 4-20mA, LoRa, and digital inputs, and supports multiple Modbus sensors over RS485. Collected data can be uploaded to a network server via 4G, NB-IoT, or Cat-1. Parameters can be configured on-site via a smartphone Bluetooth app.

This product features a wide input voltage range and ultra-low standby current, making it especially suitable for applications with strict power consumption requirements, such as solar panel power supply and disposable battery power supply.

➤ Key Features

1. 4G full-network, Cat-1 full-network, NB-IoT, and LoRa options available;
2. SL651, SZY206, and MQTT protocol options available;
3. TCP long connection and short connection modes are configurable;
4. Supports automatic network time synchronization and server-based time calibration;
5. Supports multi-channel reporting (one sender, multiple receivers);
6. Supports BeiDou short message communication;
7. Supports remote maintenance, firmware upgrades, and data pass-through;
8. Supports short-range Bluetooth for parameter configuration and data pass-through;
9. Supports exporting historical data via Bluetooth and RS232;
10. 7-32V DC wide voltage power supply.

➤ Application Areas

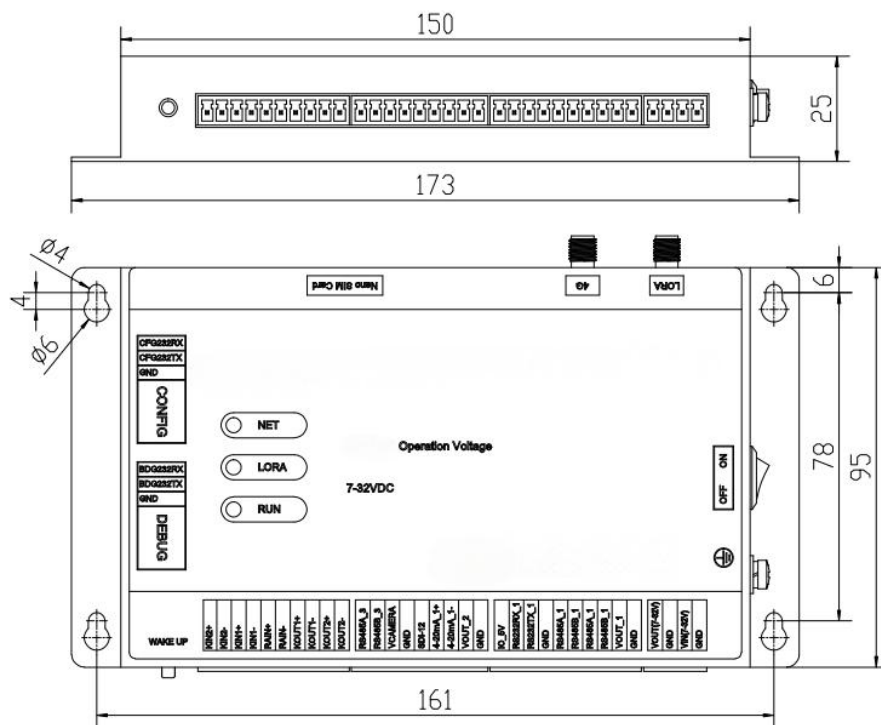
Widely applicable in water conservancy informatization, smart cities, water utilities, environmental protection, chemical industries, and other IoT-related fields involving data acquisition, storage, communication, and remote control — including hydrology, water resources, water environment, water pollution, flash flood disaster prevention, reservoir safety, and dam safety remote monitoring.

1.2 Specifications

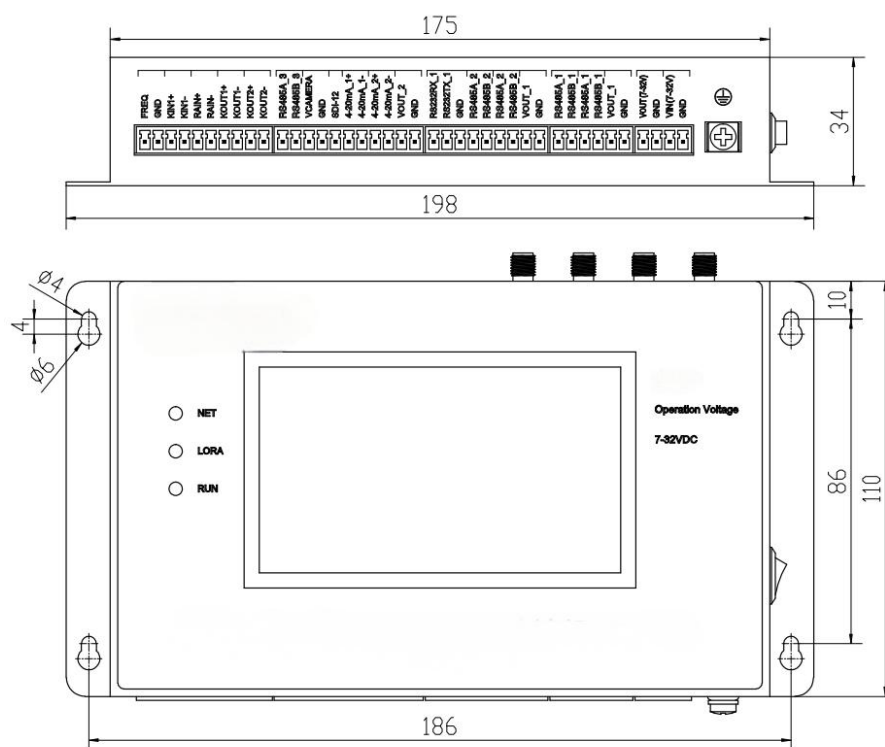
- H2100-RSeries Product Specifications Comparison:

	H2100-R	H2100-R-C0/C1	H2100-R-S
Supply Voltage	7-32VDC		
Sleep Current	0.1mA@12V	1mA@12V	0.1mA@12V
4.3-inch HD Capacitive Touchscreen	None	H2100-R-C0: None H2100-R-C1: Standard	None
Debug Port (type-c or RS232)	1 Channel		1 Channel
Config Port (type-c or RS232)	1 Channel		None
Low-Power Bluetooth	Standard		Standard
Lora	Optional	Optional	Optional
RS485	3 Channels	5 Channels	1 Channel
RS232	1 Channel	3 Channels	None
SDI-12 Input	1 Channel		None
4-20mA Acquisition	1 Channel	2 Channels	1 Channel
Rain Gauge Signal Input	1 Channel		
Serial Camera	Supported (occupies one RS485 channel)		None
Ethernet	None	1 Channel	None
Digital Input	2 Channels		None
OC Output (OC)	2 Channels		1 Channel
Controlled Power Output	3 Channels		1 Channel
Uncontrolled Power Output	1 Channel		None
Frequency Acquisition	None	1 Channel	None
SD Card	None	1	None
Communication Mode	4GFull-network / CAT-1 Full-network/NB-IOT/Overseas customizable		
BeiDou Short Message	External BeiDou short message terminal available	Optional built-in BeiDou short message (external also available)	None
Storage Capacity	32M		
Parameter Configuration Method	Serial port, Bluetooth, Remote platform		Bluetooth, Remote platform
Communication Protocol	SL651, SZY206, MQTT, HTTP, Other custom protocols		
Network Channels	Multi-destination (5 channels supported, one as maintenance channel)		
Status Indicator LEDs	RUN / NET / LORA		RUN / NET
Operating Environment	Temperature: -40~+85°C Humidity: ≤95%	Temperature: H2100-R-C0: -40~+85°C H2100-R-C1: -20~+75°C Humidity: ≤95%	Temperature: -40~+85°C Humidity: ≤95%
Dimensions	173mm*95mm*25mm	198mm*110mm*34mm	110mm*72mm*26mm

➤ Dimensions



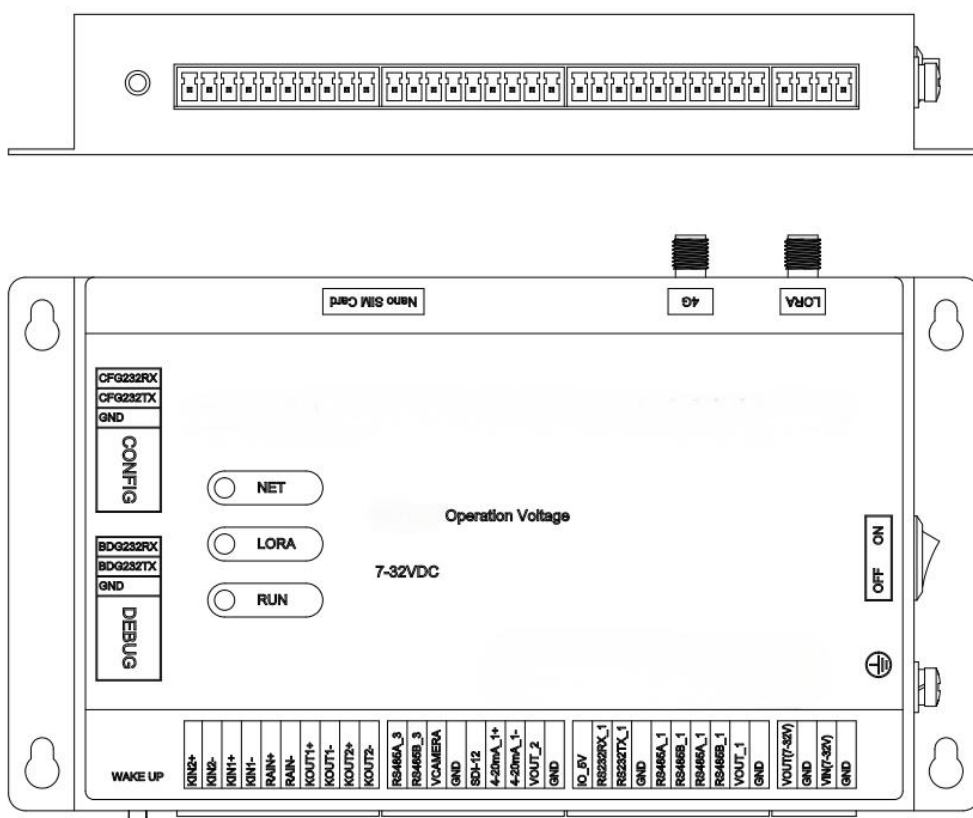
H2100-R Dimensions Diagram



H2100-R-C0/C1 Dimensions Diagram

1.3 Interface Definition and Appearance

➤ H2100-R



H2100-R Interface Definition Diagram

➤ **H2100-R-C0 / H2100-R-C1**

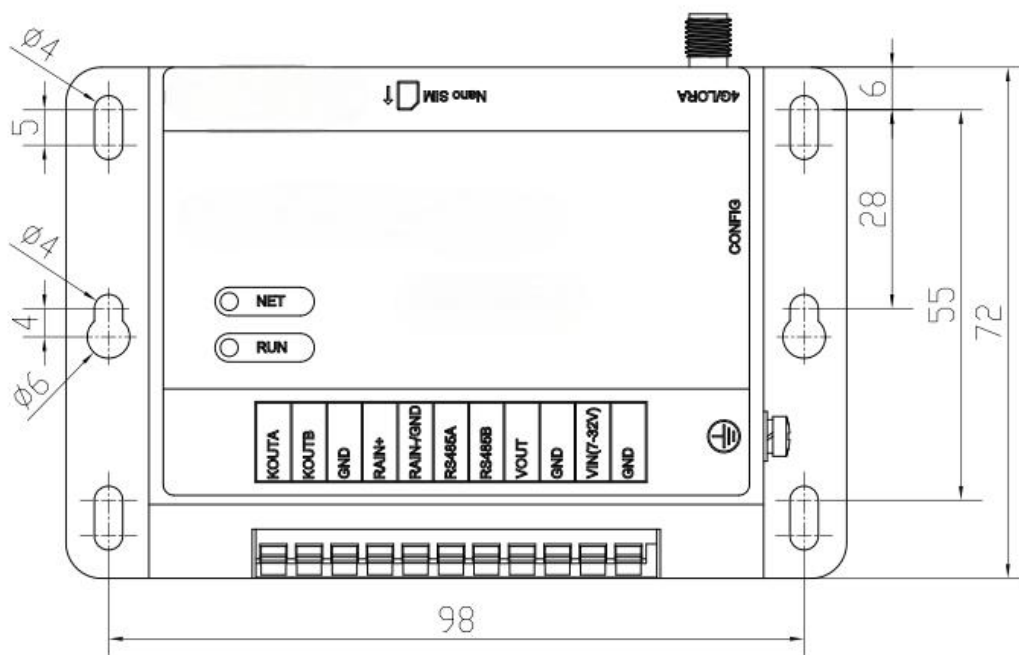


H2100-R-C0



H2100-R-C1





H2100-R-S Interface Definition Diagram

1.3.1 Power Input

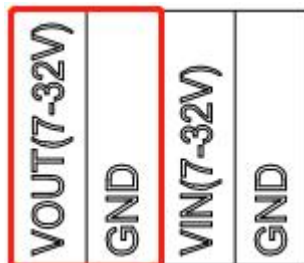


VIN(7-32V): Connect to DC power positive, voltage range 7-32V

GND: Connect to DC power negative (GND)

1.3.2 Power Output

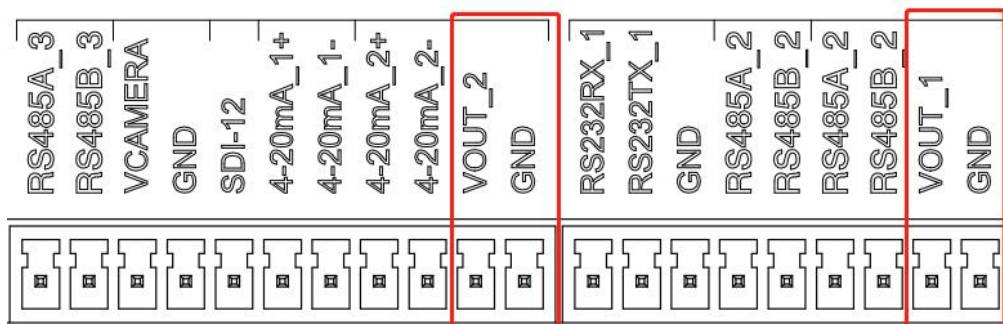
- Direct Input Power Output



VOUT(7-32V): Power output positive, voltage equals input voltage

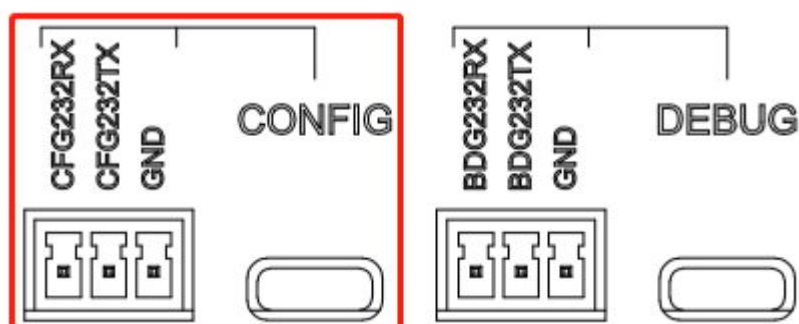
GND: Power output negative (GND)

➤ Controlled Power Output



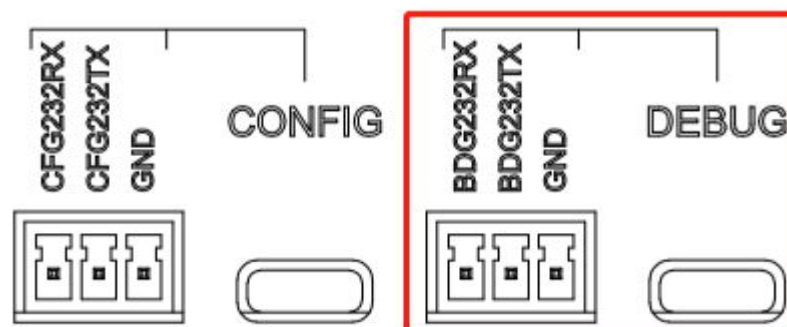
The device includes multiple controlled power outputs. The output voltage equals the device input voltage. Each controlled power channel's supply mode and duration can be configured via the desktop configuration tool. VOUT_X(X = controlled power output channel number): Sensor controlled power output positive
VCAMERA: Camera controlled power output
GND: Controlled power output negative (GND)

1.3.3 Configuration Serial Port



The device includes one configuration serial port. It supports TYPE-C-type or RS232-type interface output. Users can connect to a PC via TYPE-C cable or RS232-to-USB cable. Once connected, the device can be configured using the desktop software.

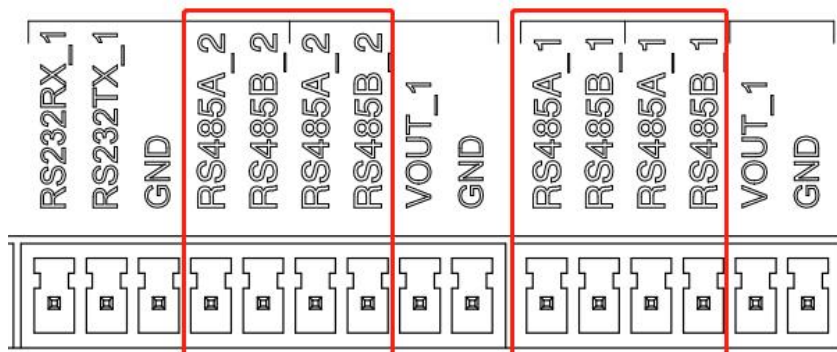
1.3.4 Debug Serial Port



The device includes one debug serial port, also supporting TYPE-C and RS232 interfaces. This port is not needed under normal operation. It should only be

used under technician guidance when diagnosing field faults or resolving complex issues.

1.3.5 RS485

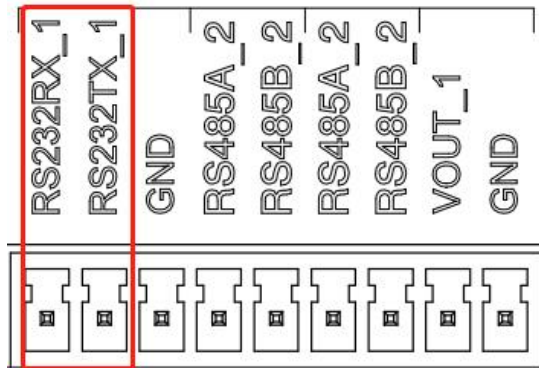


The device includes one or more independent RS485 acquisition channels. Identical RS485 channel labels on the device are connected in parallel. For example, if there are two RS485A_1 labels, they are both derived from the same RS485 channel. Each RS485 channel supports connecting Modbus devices with different baud rates.

RS485A_X(X = RS485 channel number): Connect to RS485 sensor A line

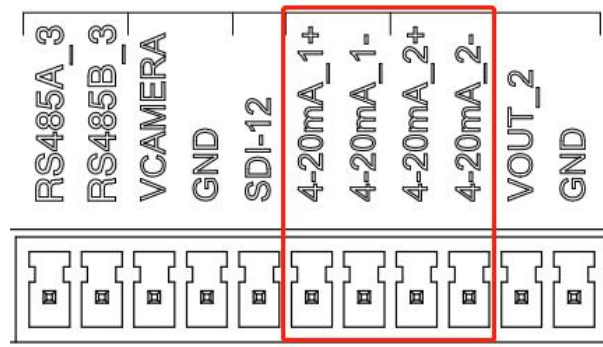
RS485B_X(X = RS485 channel number): Connect to RS485 sensor B line

1.3.6 RS232



The device includes one or more RS232 acquisition channels, primarily for connecting the company's BeiDou communication terminal or other RS232-type interface sensors.

1.3.7 4-20mA

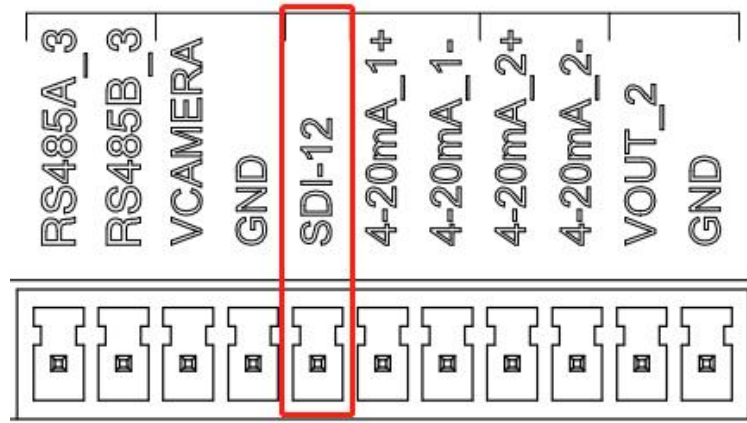


The device includes one or two 4-20mA interfaces for collecting 4-20mA device data. Users must configure the 4-20mA acquisition 4mA and 20mA corresponding values in the desktop tool.

4-20mA_X+(X = 4-20mA channel number): Connect to sensor 4-20mA positive

4-20mA_X-(X= 4-20mA channel number): Connect to sensor 4-20mA negative (typically connected to device GND)

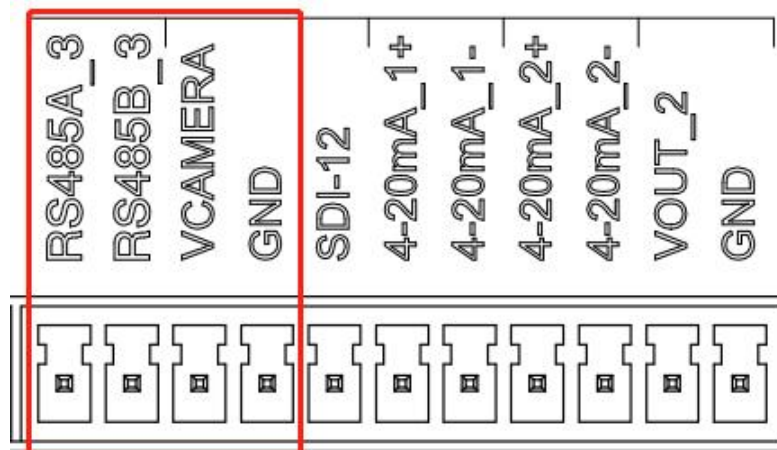
1.3.8 SDI-12



The device includes one SDI-12 interface for collecting SDI-12 device data. One SDI-12 interface supports connecting multiple SDI-12 devices simultaneously (SDI-12 device addresses must be unique). Note: SDI-12 sensors must share a common ground with the device.

SDI-12: Connect to SDI-12 sensor. When connecting multiple SDI-12 sensors, the data lines of multiple SDI-12 devices must be tied together.

1.3.9 Serial Camera

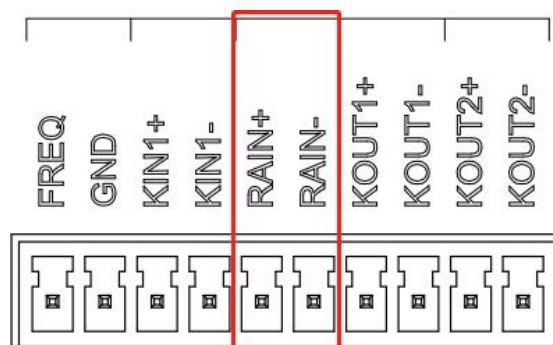


The device supports connecting an RS485 serial camera. The device has a built-in manufacturer-specified camera protocol. Non-specified cameras may require evaluation for custom protocol development.

RS485A_3: RS485 Serial Camera A Line

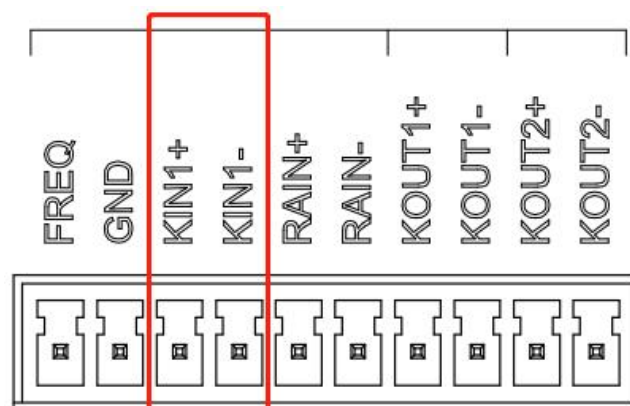
RS485B_3: RS485 Serial Camera B line

1.3.10 Rain Gauge



RAIN+ and RAIN- connect to the two terminals of the rain gauge respectively. The rain gauge is a passive sensor; polarity does not need to be observed.

1.3.11 Digital Input

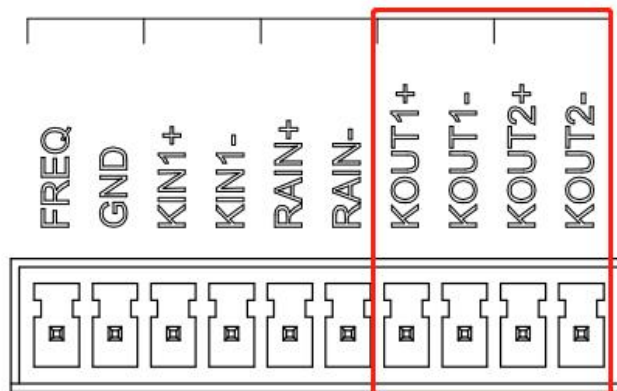


The device supports two digital input interfaces. They can be connected to door magnetic switches for door-open detection or to level switches and other digital input sensors.

KINX+(X = digital input channel number): Digital input positive

KINX-(X = digital input channel number): Digital input negative

1.3.12 Digital Output



The device supports two digital output interfaces, which can be used to control solenoid valves, audible-visual alarms, relays, and similar devices.

KOUTX+(X = digital output channel number): Digital output positive

KOUTX-(X = digital output channel number): Digital output negative

1.4 Satellite Communication

The H2100-R can connect to a satellite terminal via serial port. The H2100-R-C0/C1 can optionally include a built-in BeiDou-3 satellite communication unit, supporting dual-channel communication via 4G and satellite.

1.5 Antenna

All antennas on the device use SMA connectors. SMA female-thread, male-pin SMA antennas must be used.

4G: Connect to 4G network antenna

LORA: Connect to LoRa antenna

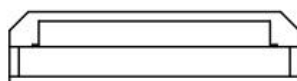
BD_RX: Connect to BeiDou short message RX antenna

BD_TX/GPS: Connect to BeiDou short message TX antenna or GPS positioning antenna

1.6 SIM Card

The device supports a built-in embedded SIM card or a removable Nano SIM card. For Nano SIM cards, insert with the notch facing inward and the chip facing down.

Nano SIM Card



1.7 Power Indicator LEDs

The device has three LCD indicator lights

RUN: Device running status — blinks once every 100 seconds under normal operation

LORA: Blinks during LoRa communication

NET: Network status indicator. Operating states are as follows:

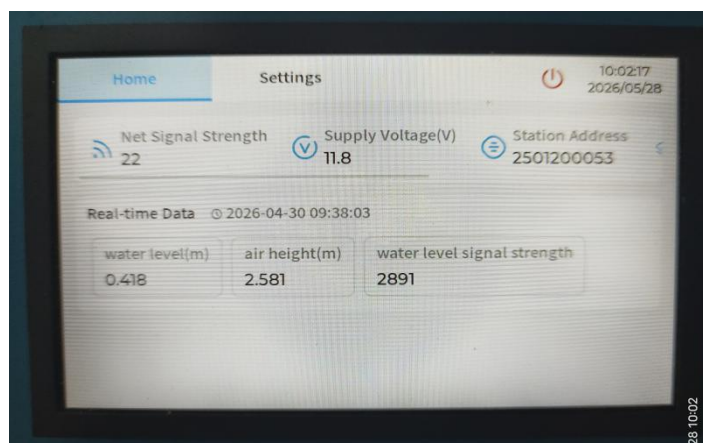
NETLED Status	Network State Indicated
Slow blink (200ms ON / 1800ms OFF)	Searching for Network
Slow blink (1800ms ON / 200ms OFF)	Standby Mode
Fast blink (125ms ON / 125ms OFF)	Data Transmitting

1.8 LCD Display

Only the H2100-R-C1 model supports LCD display functionality.

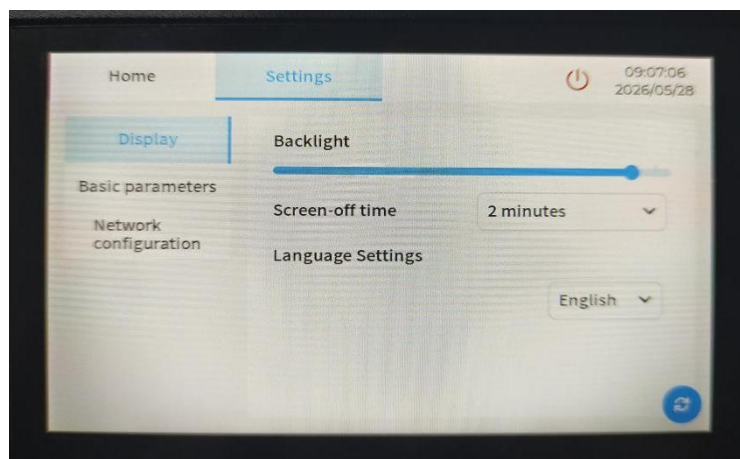
1.8.1 Home Page

The home page displays device information, network status, and real-time data (the most recently collected data).

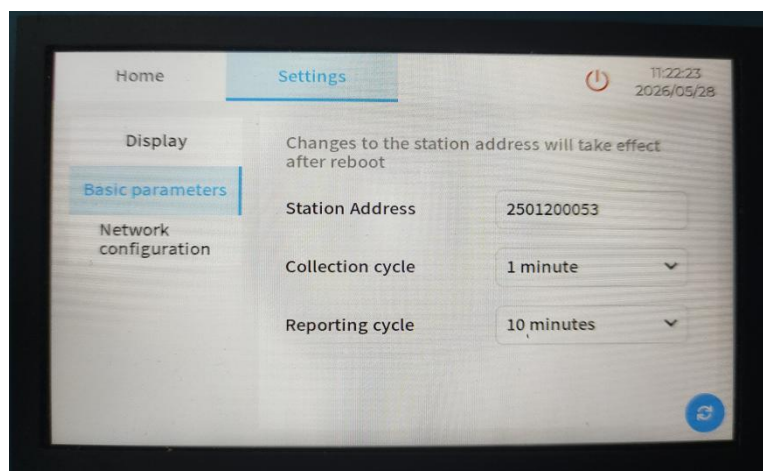


1.8.2 Settings

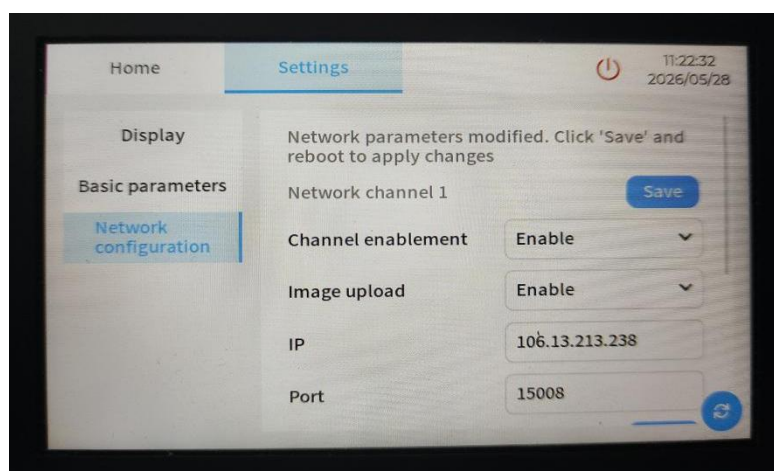
➤ Display



➤ Basic Parameters



➤ Network Configuration



2. Upload Protocol

2.1 SL651 Protocol

The device can upload data and photos using the standard SL651 protocol. The SL651 elements to report, timed report identifiers, identifier lengths, and decimal places can all be configured via the desktop tool.

2.2 SZY206 Protocol

The device supports the standard SZY206 protocol.

2.3 MQTT Protocol

Data can be published via MQTT. The device has built-in integration protocols for

several platforms. Simply configure the MQTT parameters in the desktop tool to connect directly to an MQTT server.

2.4 Environmental Protocol

The device supports the standard HJ212 environmental protocol.

2.5 Other Protocols

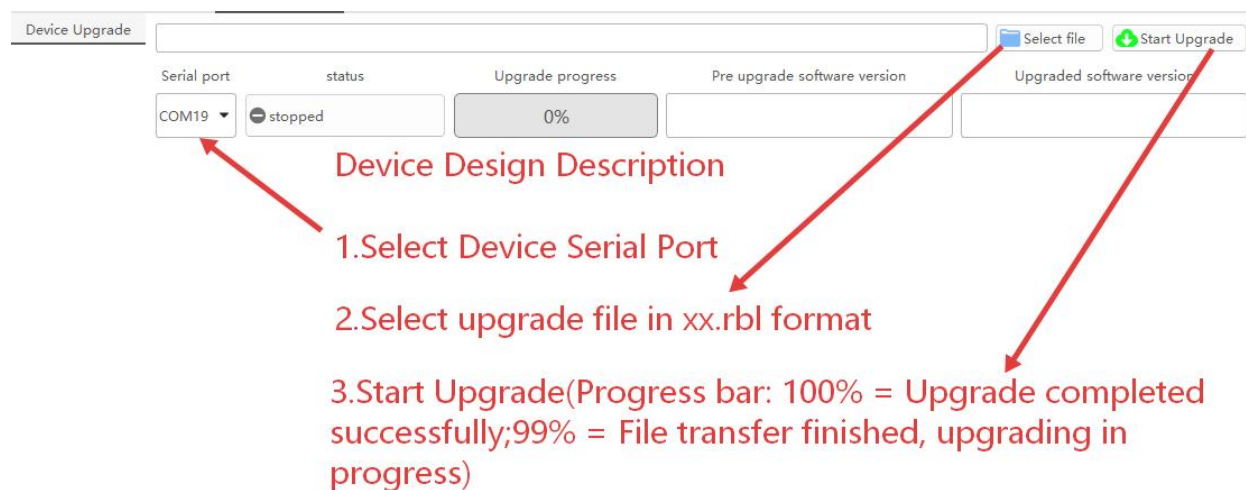
Upload protocols can be customized based on actual application requirements.

3. Desktop Configuration Tool

3.1 Main Interface

1. Firmware Upgrade Procedure

- Connect the device and select the serial port
- Select the .rbl upgrade file
- Click "Start Upgrade" and wait until the progress bar reaches 100%



Please check the version number manually after upgrade.

Figure 2-1 Modify Configuration

3.2 System Settings

1. Function Page Overview

- System Settings → System Parameters
Configure basic settings, sensor acquisition filtering, network, APN, power channels, and other parameters
 - System Settings → Acquisition Parameters
Configure Modbus device parameters such as: physical channel, device address, baud rate, parity bit, parameter name, register address, function code, number of registers, and data type. Click "Add Device" and configure as needed.
 - System Settings → Element Mapping Table
Configure the parameters for the reporting platform
 - System Settings → Device Information
Device ID, test station address, software version, and other information
2. How to Modify Device Configuration
- Connect the device and select the serial port
 - Select the parameter page
 - Read device parameters and wait until the progress bar reaches 100%
 - Edit the parameters
 - Write the edited parameters and wait until the progress bar reaches 100%

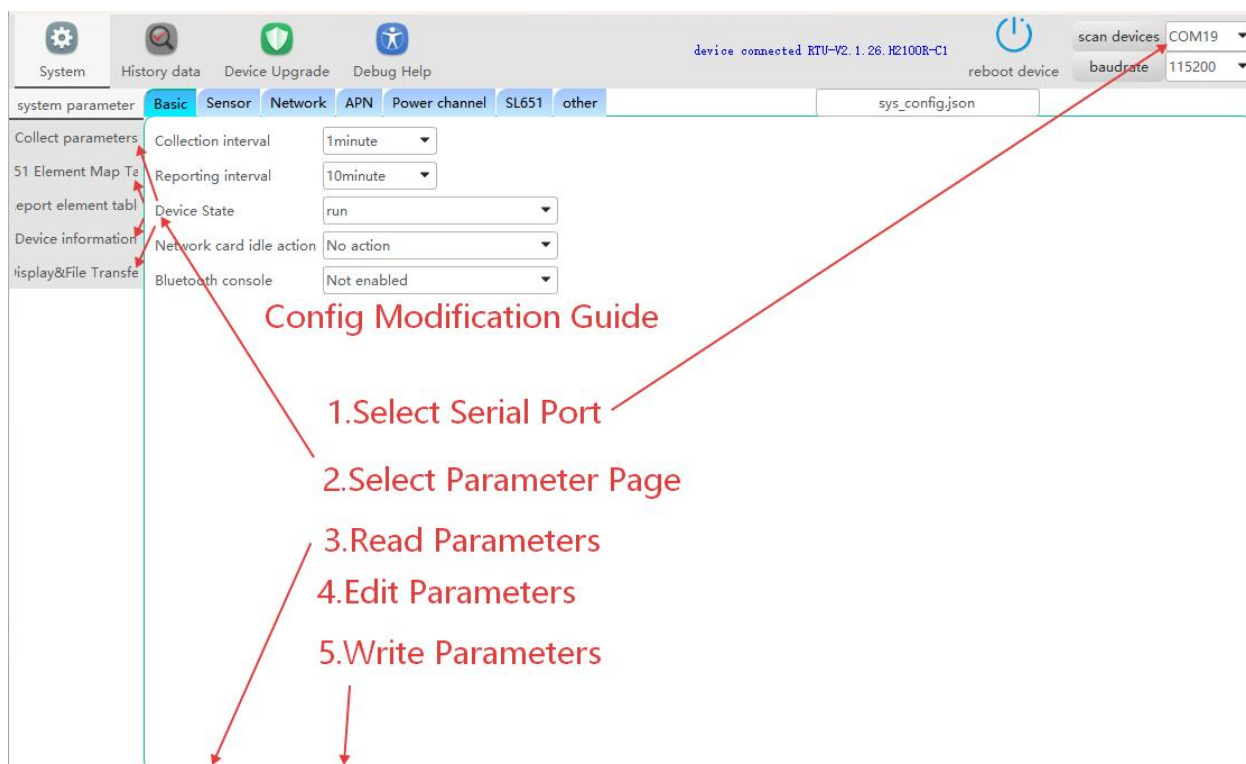


Figure 2-2 Modify Configuration

3. How to Import a PC Configuration File to the Device

- Connect the device and select the serial port
- Select the configuration file
- Write the configuration file and wait until the progress bar reaches 100%

3.3 Device Debugging

1. How to Change the Test Station Address

- Connect the device and select the serial port
- Enter the station address
- Click the "Modify" button and wait for the success prompt

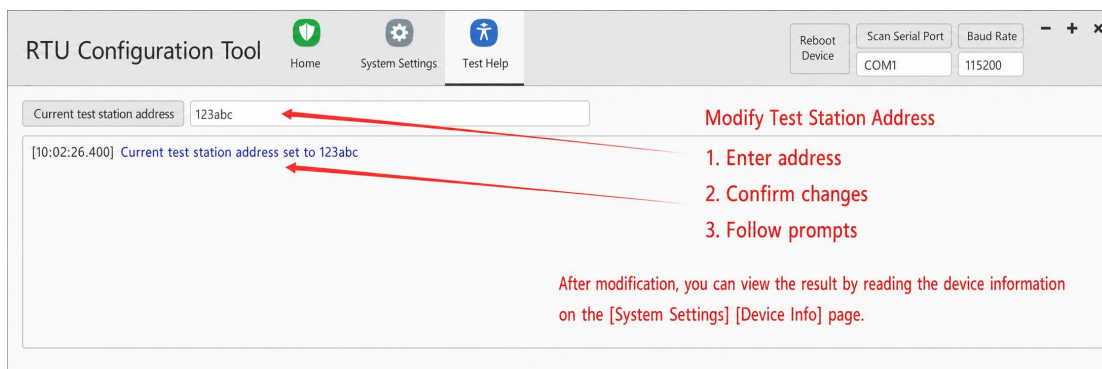
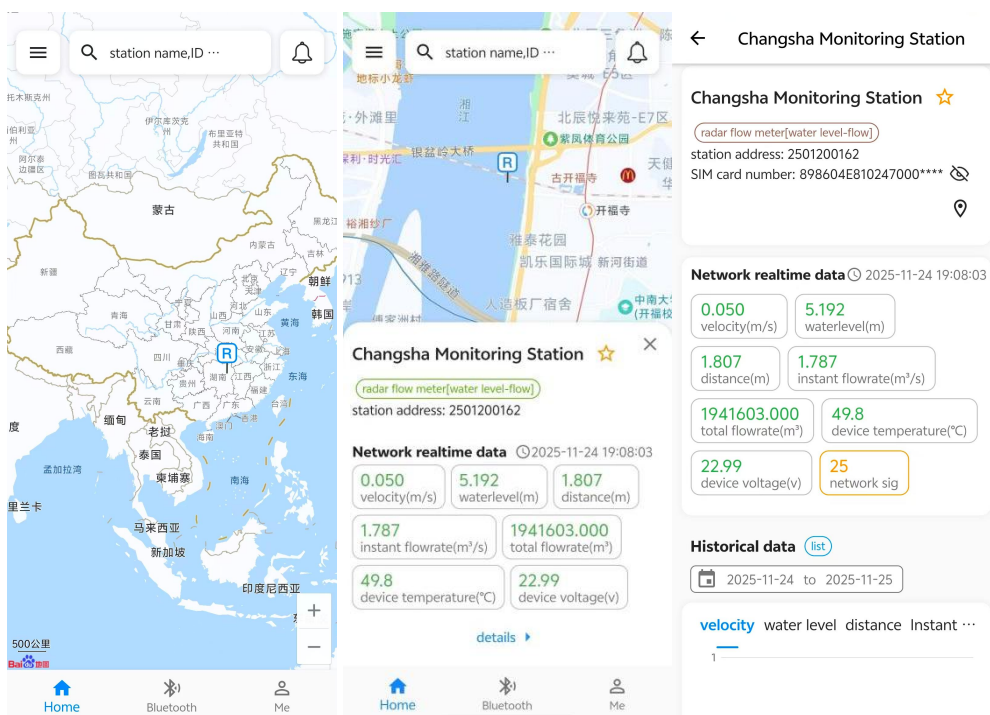


Figure 2-3 Modify Test Station Address

4. Mobile App

4.1 Device Map

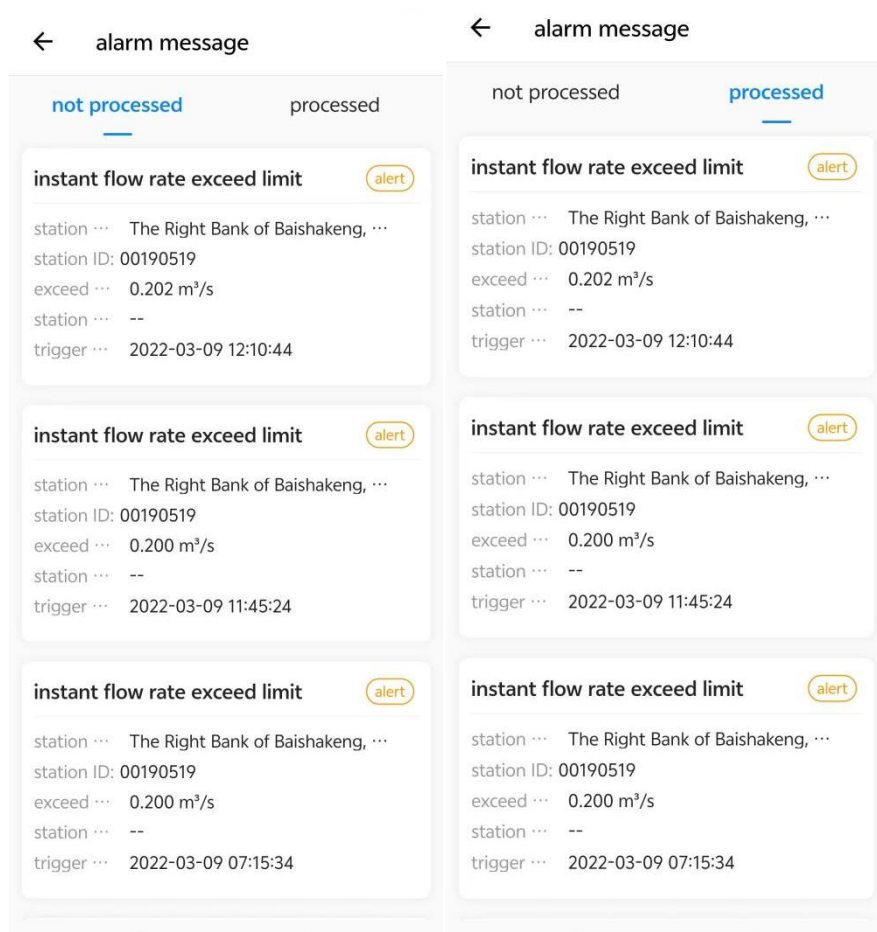
The mobile app displays devices as icons on a map. Tapping an icon shows the device's most recently uploaded data. Tapping "Details" displays full device information and historical uploaded data.



4.2 Alarm Notifications

Tap the icon in the upper-right corner of the home page  to enter the alarm notification interface. Notifications are displayed as cards, categorized into

"Accepted" and "Pending." Tap the "Accept" button on a pending notification card to mark it as accepted.



4.3 RTU Configuration

4.3.1 Status Information

Status information displays the device's station address, network signal strength, network status, system status, temperature, voltage, system time, and software version.

←

2501000373

⋮

status info

basic setting

other setting

🕒 2025-11-24 20:23:17

station address
2501000373

network sig intens
21

network status
OK

system status
run

temperature(°C)
24.25

voltage(v)
11.85

system time
2025/11/24
20:23:14

software version
RTU-
V2.2.2.H2100R

4.3.2 Basic Settings

Basic settings are primarily used to configure RTU basic information, network channel configuration, MQTT upload parameter configuration, and system configuration.

←

2501000373

⋮

status info

basic setting

other setting

station address

2501000373 >

sensor power on duration

always on >

sample interval

5 minute >

rtu transmit interval

5 minute >

network setting

network channel1 106.13.213.238 : 15008 >

network channel2

not used >

network channel3

not used >

APN setting

>

MQTT setting

MQTT setting >

system config

clear history record >