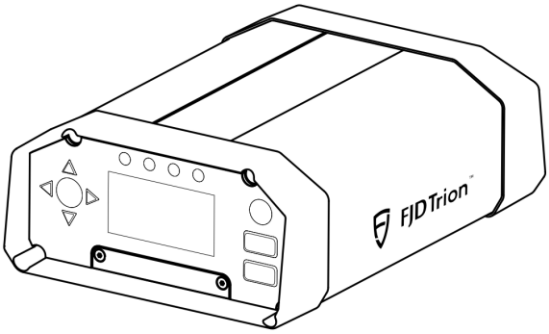
FJDTrion™



N10 GNSS Reference Receiver

User Manual

February 28, 2025 | Rev. 1.5

Copyright Notice:

Revisions:

Version	Date	Description	Revised By
1.5	2025.02.28	First release	Terry.Qin

Read Before Use:

Operate in strict accordance with this manual.

Failure to follow the instructions may result in device damage and performance degradation.

If you have any questions during use, contact the service personnel.

Disclaimer:

- The purchased products, services, and features are stipulated by the contract. All or part of the products, services, and features described in this manual may not be within the scope of your purchase or usage. Unless otherwise specified in the contract, all the content in this manual is provided "AS IS" without warranties of any kind, express or implied.
- The content of this manual is subject to change due to product upgrades and other reasons. FJDynamics reserves the right to modify the content of this manual without notice.
- This manual only provides guidance for use of this product. Every effort has been made in the preparation of this manual to ensure accuracy of the content, but no information in this manual constitutes a warranty of any kind, express or implied.

Preface

Thank you for using this N10 GNSS Reference Receiver from FJDynamics. This manual provides detailed instructions for use of this product. Read this manual carefully and follow the instructions to operate this product. If you have any questions, contact the customer service of FJDynamics.

Purpose

This manual introduces the physical characteristics, specifications, operation, and use of the product.

Technical Support

- FJDynamics official website: https://www.fjdynamics.com
- FJDynamics customer service: service@fjdynamics.com

Safety Instructions

Before using this product, ensure that you have read and understand all the safety instructions and precautions in this manual. You must abide by the safety instructions in this manual and all applicable local laws and regulations.

Operation Environment:

- Keep away from tall trees, high-voltage power lines, tall buildings, airports, signal towers, and other obstacles, to avoid interference to GNSS signals and ensure the positioning accuracy and stability.

Others:

1. Do not disassemble the product without authorization, which may invalidate the warranty.
2. Damage caused by force majeure events, such as lightning strikes, high voltage, and collision, is not covered by the warranty.
3. Use the device in strict accordance with this manual. When connecting cables such as data cables, hold the end of the connector and gently plug or unplug it to avoid damaging the connector.
4. Use chargers designated by FJDynamics and pay attention to the rated voltage of the receiver to avoid device damage.
5. During charging, keep away from fire sources, flammables, and explosives to avoid fire and other serious consequences.
6. Do not plug or unplug cables when the receiver is powered on. Replace damaged cables in time to avoid device damage and personal injury.

Contents

1 Product Introduction

1.1 Overview

N10 GNSS Reference Receiver is the second-generation receiver developed by FJDynamics. It is a high-precision receiver that supports multiple frequencies from multiple constellations such as BDS, GPS, GLONASS, Galileo, and QZSS. Supporting chip-level multipath mitigation, it can offer millimeter-level carrier phase measurements and centimeter-level RTK positioning.

Being highly reliable and available, it is widely applied to GBAS, precision agriculture, surveying and mapping, deformation monitoring, and machine control.

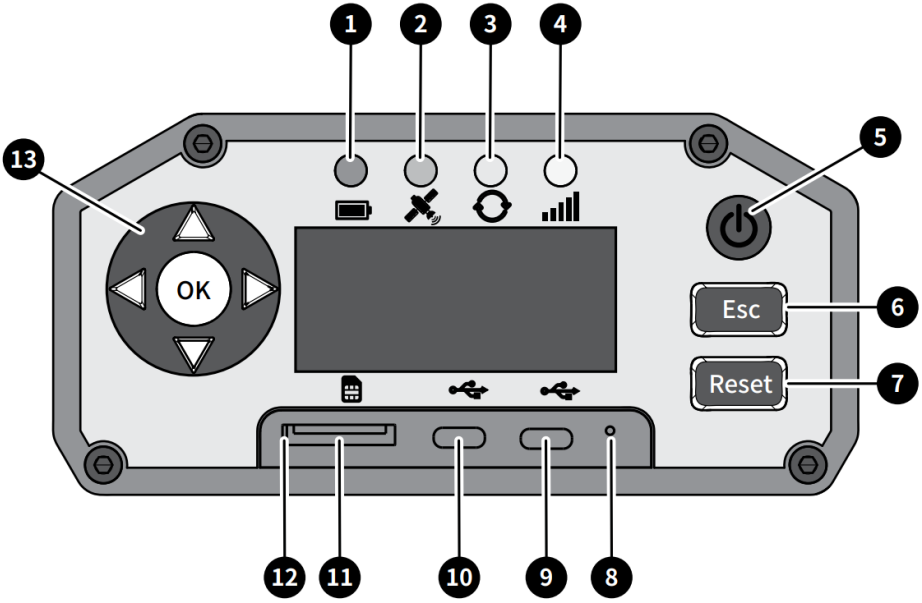
It supports 4G, Wi-Fi, and Ethernet communications. With an aluminum alloy housing and IP67 rating, it is suitable for outdoor applications. The voltage stabilizing and lightning protection features ensure a higher stability.

Highlights:

1. Easy and convenient to use. It adopts an embedded Linux system and allows users to access the web interface via Wi-Fi to configure the receiver, making the operations easy and convenient.
2. Various ports. It comes with a GNSS antenna port, an RJ45 Ethernet port, a USB HOST port, a USB DEVICE port, a COM2 port, a COM1 port, an SMA external clock port, an SMA PPS output port, an SMA EVENT input port, and a 2-pin LEMO external power supply, and charging port, meeting all the input and output requirements of the reference station and peripherals.
3. Huge storage space. It has a storage space of 8 GB, and stores data in files that can be exported via the USB port or the web interface remotely. Stored data will be overwritten after a month.
4. Remote management. The 10/100 Mbps Ethernet port can meet GNSS data transfer requirements. Users can configure the receiver parameters through the LAN, front panel, and remote management. OTA firmware updates are also supported, reducing maintenance costs.
5. Rugged and durable. With an industrial-grade design, rugged aluminum alloy housing, and IP67 rating, it is highly reliable and available.

1.2 Panels

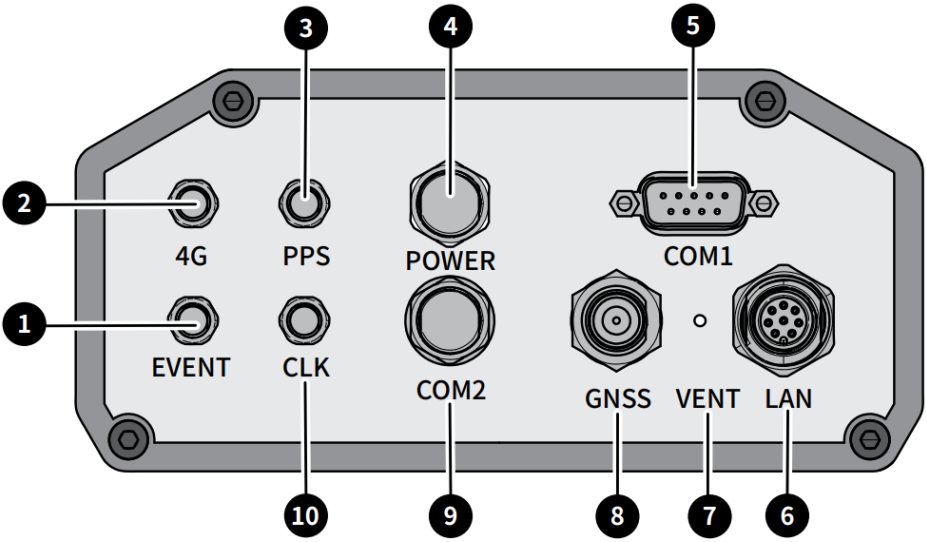
1.2.1 Front Panel



No.	Name	Type	Description
1	Battery level indicator	LED	▪ Solid blue: With external power supply (charging). ▪ Solid green: The battery level is between 30% and 100% (not charging). ▪ Solid red: The battery level is below 30% (not charging).
2	Satellite tracking indicator	LED	• Off: The receiver does not track any satellite or tracks less than four satellites. • Solid blue: The receiver tracks at least four satellites.
3	Differential correction indicator	LED	▪ Blinks blue once per second: The base station mode is enabled successfully. ▪ Blinks green once per second: The positioning status in rover mode is fixed solution. ▪ Blinks red once per second: The positioning status in rover mode is single point solution, float solution, or RTD.
4	Network	LED	▪ Solid green: Ethernet/4G/Wi-Fi connection works, and data can

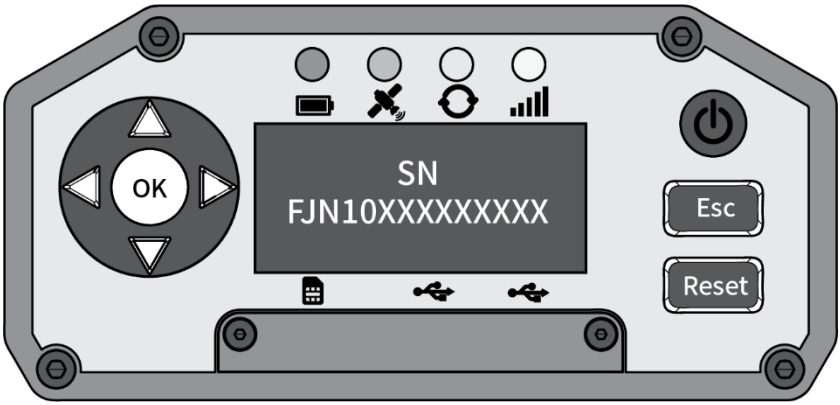
	indicator		be transmitted stably. ▪ Blinks green once per second: 4G/Wi-Fi signal strength is poor, and data cannot be transmitted.
5	Power button	Button	Turn on or off the receiver.
6	Escape button	Button	Exit operations on the screen.
7	Reset button	Button	Reset the receiver.
8	Force restart button	Button	Use a card removal pin to press and hold the button for 1 second and then release it, and the receiver will restart automatically.
9	USB DEVICE port	Type-C	Connect to a Type-C cable to burn firmware. Put on the cover and fasten the screws after firmware burning to protect the port.
10	USB HOST port	Type-C	Connect to an external storage device to log data or use a USB flash drive to upgrade the receiver firmware. Use storage devices and USB flash drives from mainstream brands, for example, Kingston and SanDisk.
11	SIM card slot	Micro	Micro-sized IoT SIM cards are supported. Put on the cover and fasten the screws after inserting or replacing the IoT SIM card to protect the slot.
12	Force burning button	Button	Press and hold this button, connect to an AC power supply through the power adapter, turn on the AC power supply, and then release this button to enter the force burning mode.
11	Navigation arrow buttons and OK button	Button	Control the operations on the screen.

1.2.2 Rear Panel

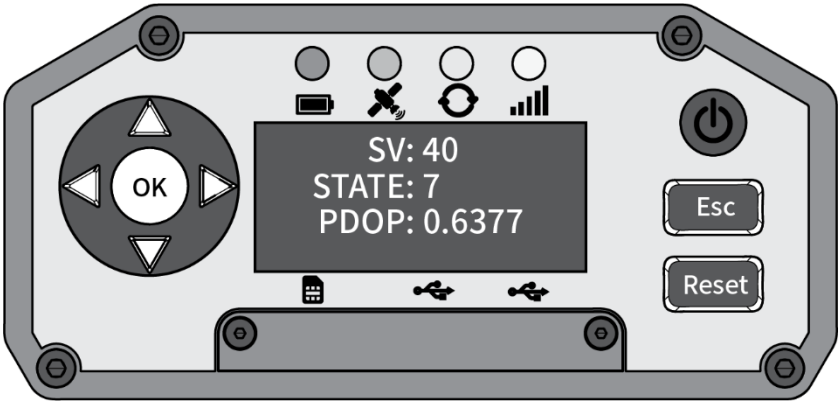


No.	Name	Type	Description
1	EVENT input port	SMA	Inputs external events.
2	4G antenna port	SMA	Connects to the external 4G antenna.
3	PPS output port	SMA	Outputs PPS signals.
4	External power supply port	2-pin LEMO	Provides power to the receiver.
5	COM1 port	DB9	Configures and transparently transfers GNSS board data.
6	Ethernet port	8-pin LEMO to RJ45	Configures and views the receiver parameters.
7	VENT	N/A	Keeps air pressure at the same level inside and outside the receiver.
8	GNSS antenna port	TNC	Connects to the external GNSS antenna.
9	COM2 port	7-pin LEMO	Outputs receiver data.
10	External clock port	SMA	Inputs external clock signals (reserved).

1.3 Display



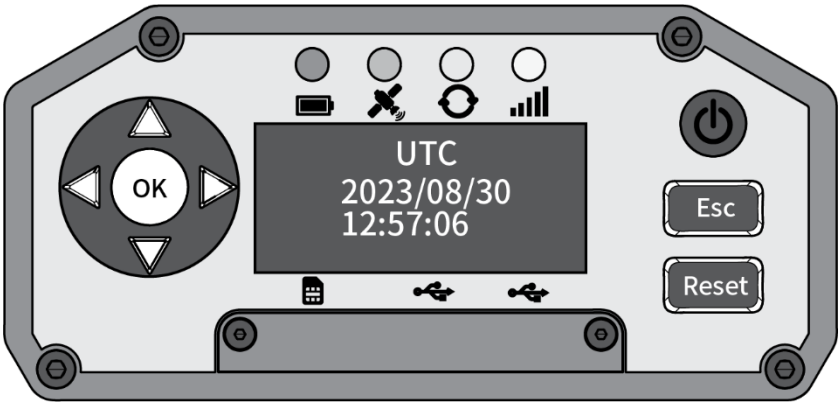
SN: serial number of the receiver.



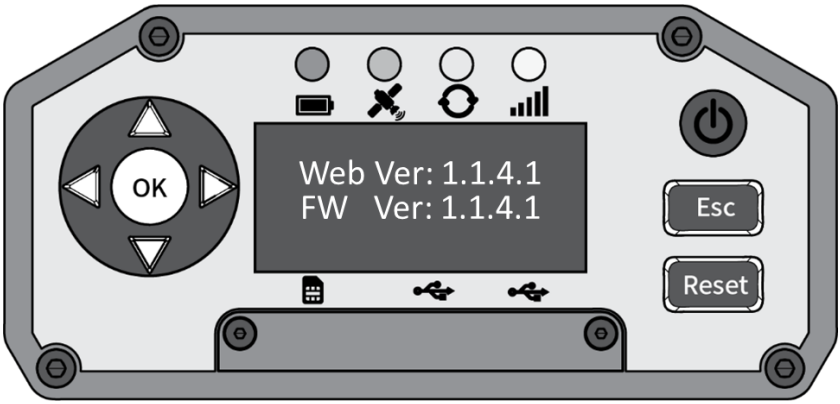
SV: number of satellites used by the receiver.

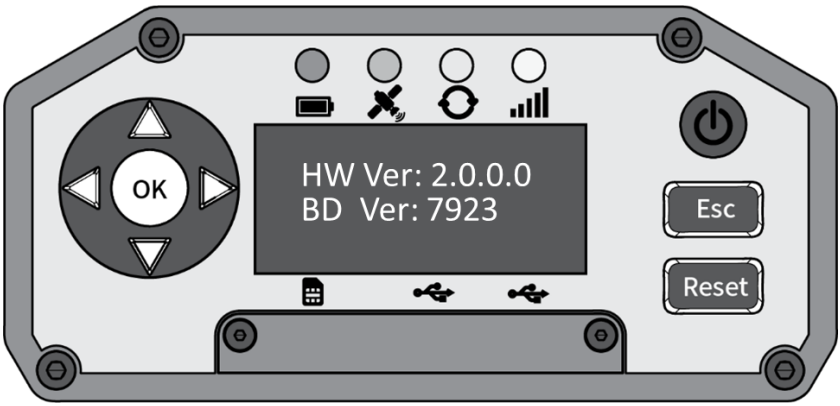
STATE: positioning status of the receiver. 1: single; 2: RTD; 4: fixed; 5: float; 6: INS; 7: reference station.

PDOP: position dilution of precision of the receiver.



UTC: UTC time of the receiver.



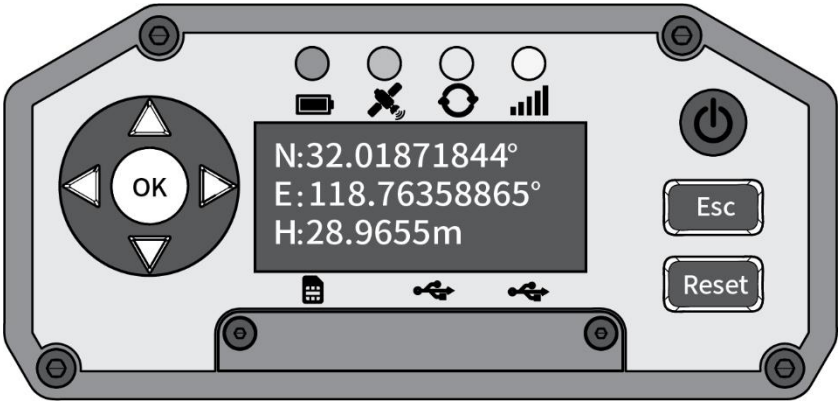


Web Ver: web version of the receiver.

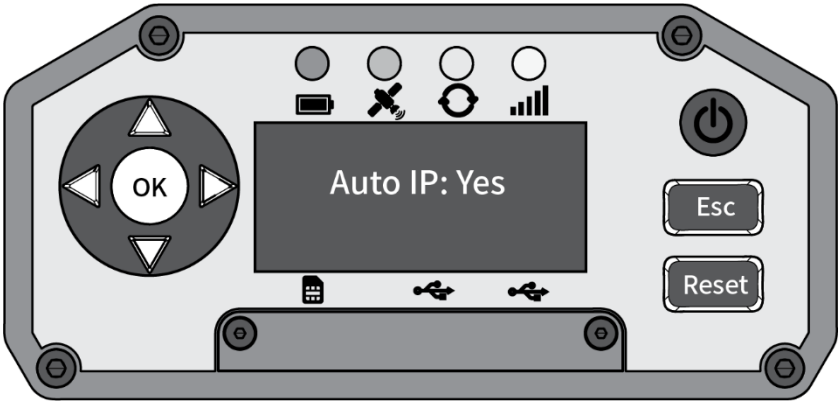
FW Ver: firmware version of the receiver.

HW Ver: hardware version of the receiver.

BD Ver: GNSS board version of the receiver.

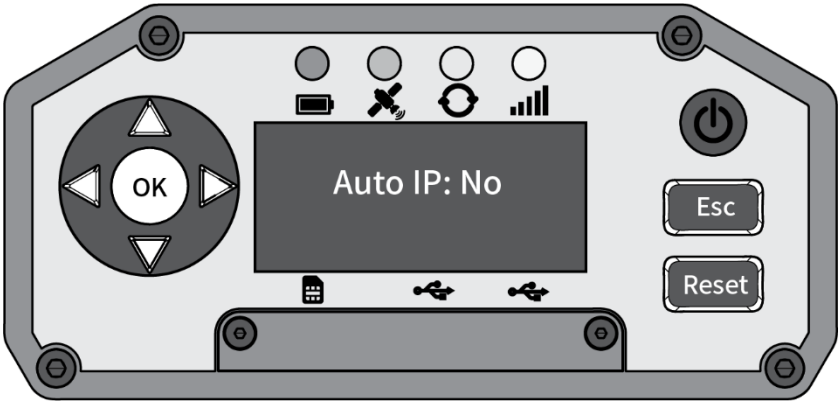


N/S, E/W, and H: latitude, longitude, and height of the receiver.

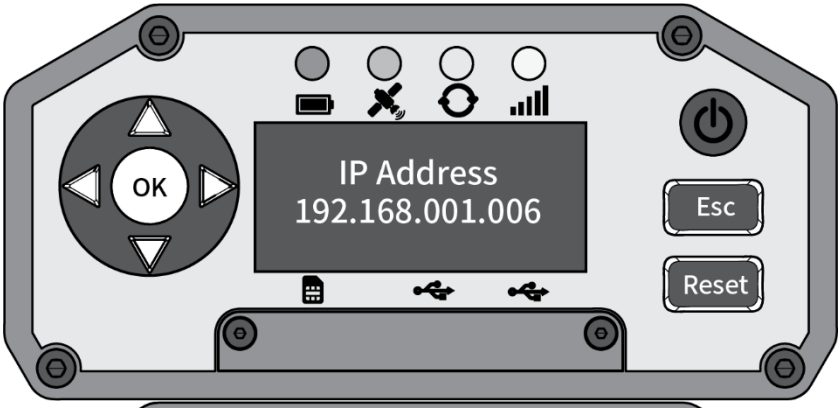


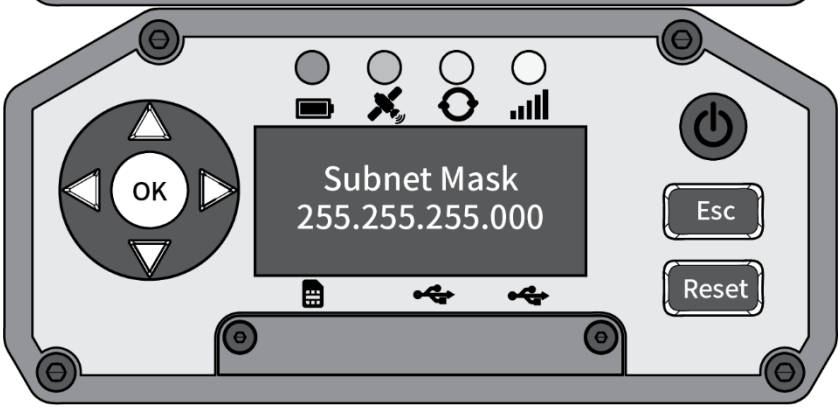
Auto IP: wired network mode of the receiver. Yes: DHCP.

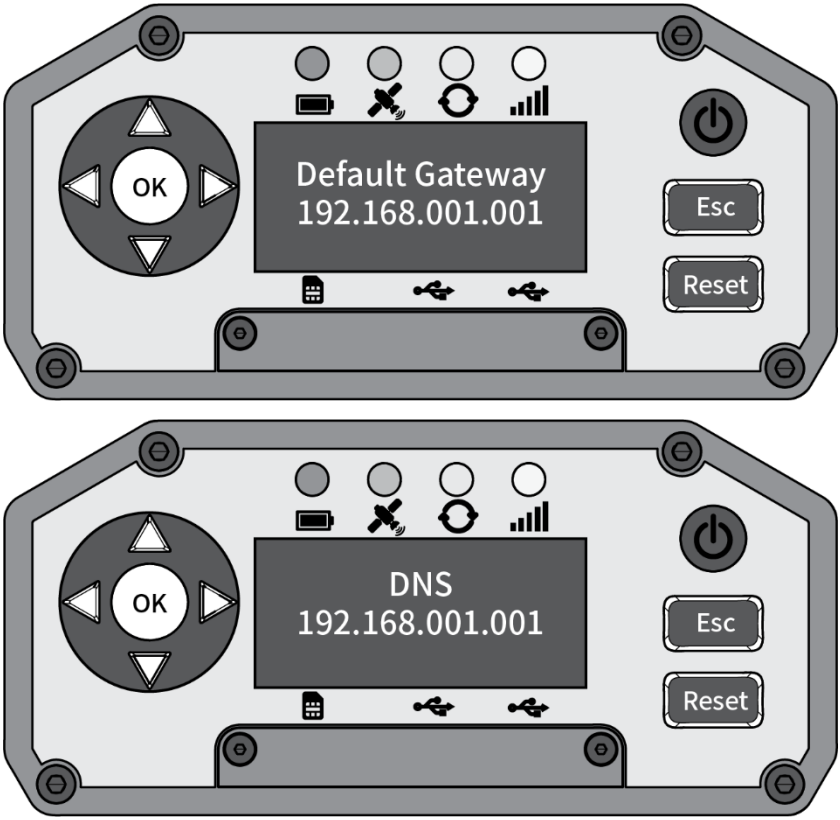
The IP address of the receiver is automatically displayed, when Auto IP is set to Yes.



Auto IP: wired network mode of the receiver. No: static IP.



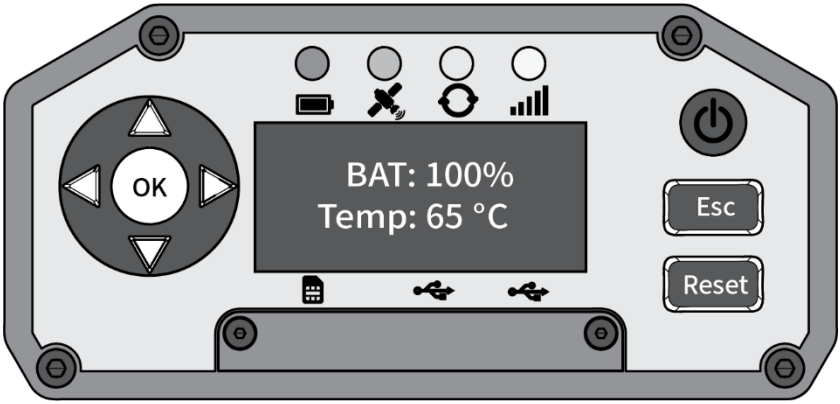




Configure the IP address, subnet mask, default gateway, and DNS based on Ethernet connection, when Auto IP is set to No.

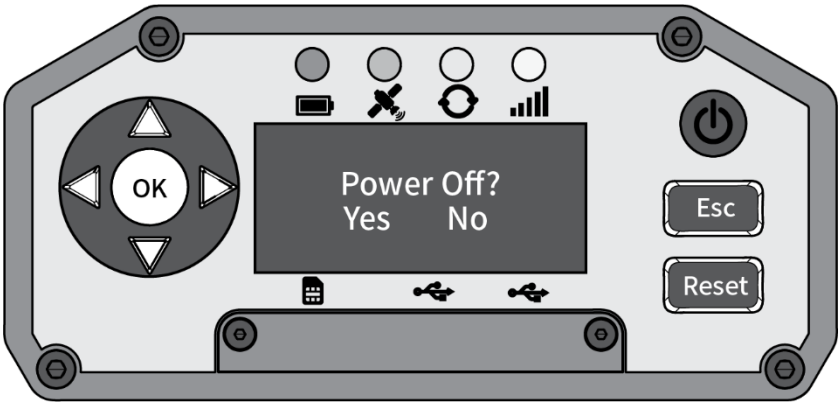
The configuration procedure is as follows, using subnet mask configuration as an example:

1. Press the up or down button to access the subnet mask screen. The default value is 255.255.255.255.
2. Press OK to start editing. By default, the first number of the subnet mask is selected. Press the left or right button to select a different number. Press the up or down button to change the selected number to any integer in the range of 0–9. Press OK to save changes and exit, or press Esc to exit without saving changes.



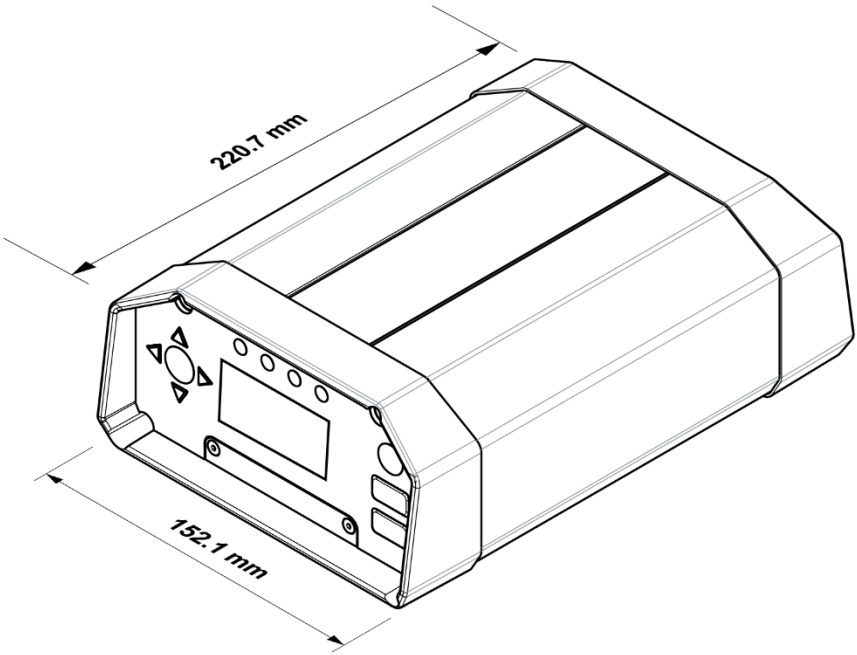
BAT: battery level of the receiver.

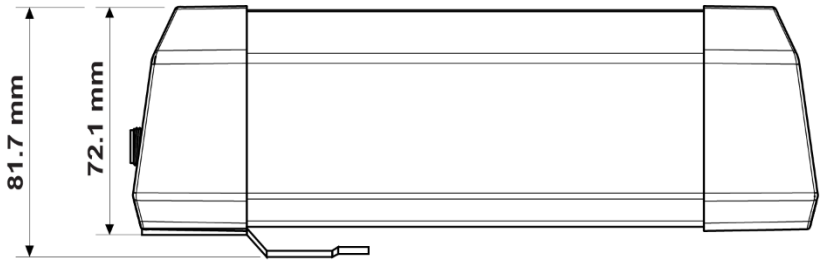
Temp: battery temperature of the receiver.



Power Off?: This message appears when you press and hold the power button. Press OK to turn off the receiver, or press Esc to keep the receiver on.

1.4 Dimensions



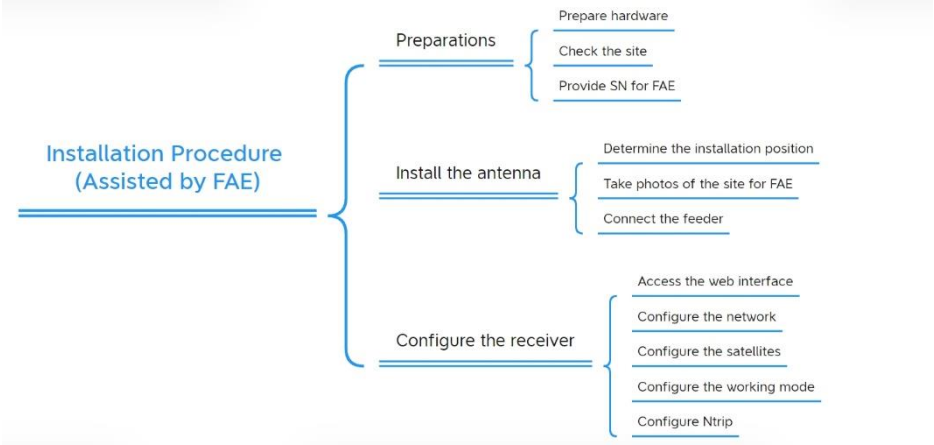


2 Quick Start Guide

2.1 Preparations

No.	Item	Qty.	Description
1	N10 GNSS Reference Receiver	1	
2	Network cable	1	To configure the receiver network. Its length should be decided on site.
3	PC (with a network port)	1	To configure the receiver.

Note: Provide the receiver SN for the FAE before the installation, and the FAE will provide the Ntrip Caster information for you. The SN, such as FJN1023300002ZC, can be found on the nameplate at the bottom of the receiver or on the side of the packaging.



2.2 Installing the GNSS Antenna

To improve the quality of satellite data received by the receiver and minimize problems caused by unstable receiver status, the following requirements must be followed when you install the GNSS antenna.

- Ensure that there is no interfering object within 300 meters of the GNSS antenna. Interfering objects include tall buildings, trees, large areas of waters, beaches, and large areas of photovoltaic panels, as shown below.

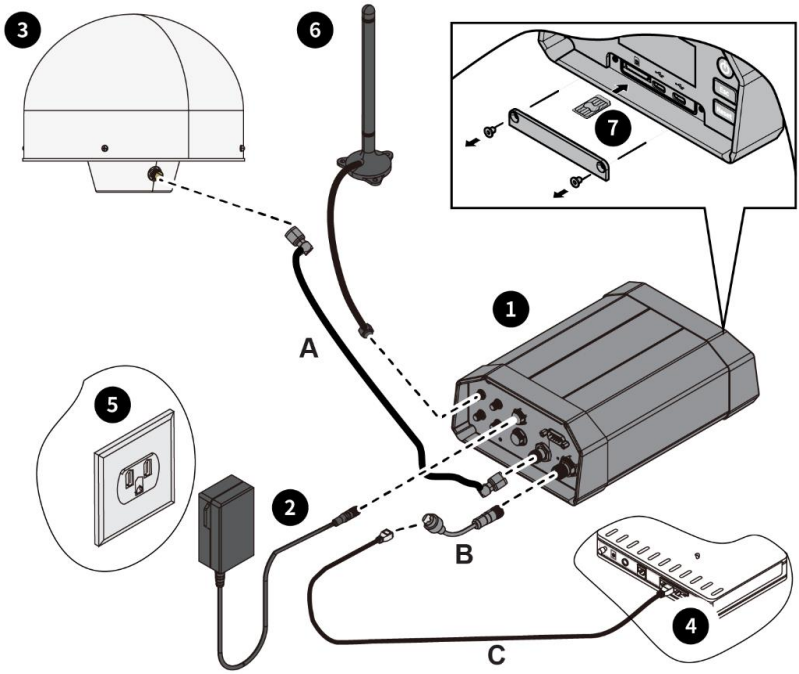


- Ensure that there is no obstruction beyond a vertical angle of 10° above the GNSS antenna. That is to say, there is no obstruction in the line of sight. Setting up the GNSS antenna at a higher position will facilitate the reception of satellite signals.
- Ensure that there is no electromagnetic interference within 300 meters of the GNSS antenna. Electromagnetic interference can be generated by microwave stations, microwave channels, radio transmitting stations, and high-voltage power lines, as shown below.



- The reference station should be set up in areas with easy access to the communication network, stable power supply, convenient transportation, and good public security.

2.3 Device Connections



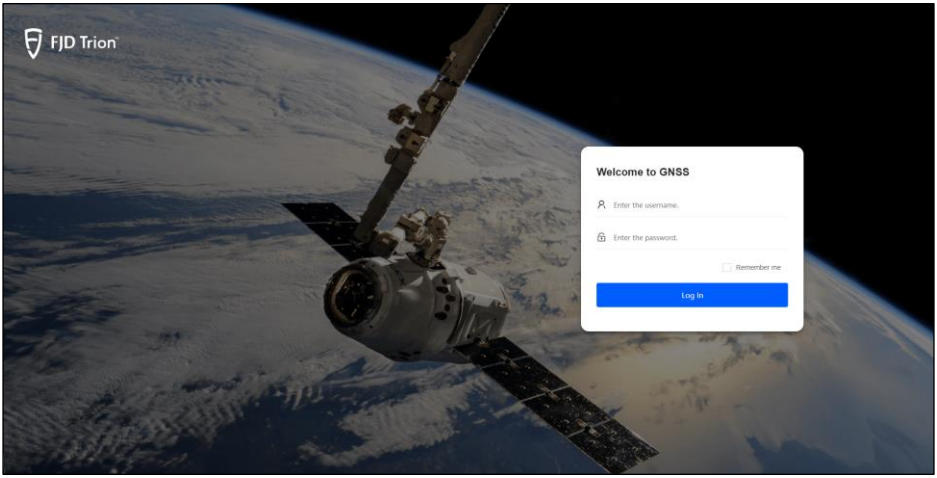
No.	Name	Remarks
1	N10 GNSS Reference Receiver	N/A
2	Power adapter	N/A
3	Choke ring antenna	N/A
4	Ethernet	External network (to be prepared by the user)
5	AC power supply	External power supply (to be prepared by the user)
6	4G antenna	N/A
7	IoT SIM card	Micro-sized 4G SIM card (to be prepared by the user)
A	Feeder	N/A
B	Network cable adapter	N/A
C	Network cable	To be prepared by the user

2.4 Configuring the Receiver

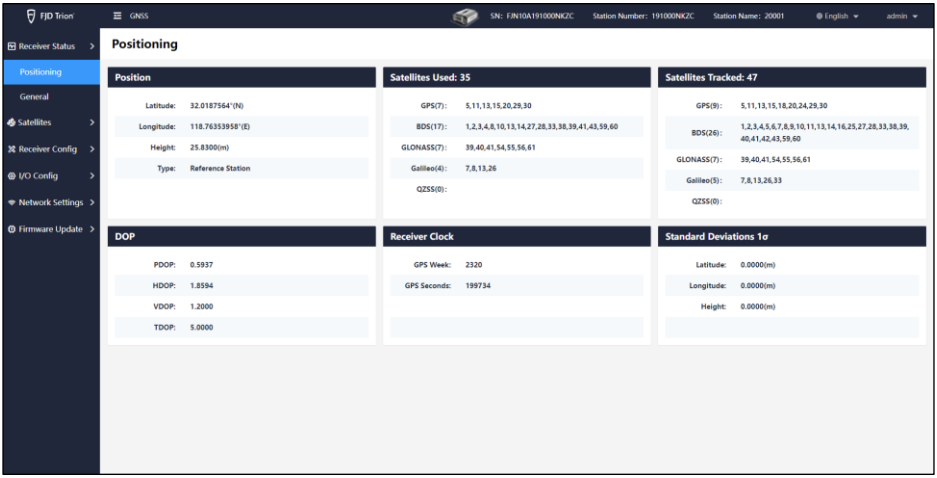
After connecting the cables as shown above, turn on the receiver and configure it through the following procedure.

2.4.1 Accessing the Web Interface

- Enable Wi-Fi on the PC, find the receiver Wi-Fi "FJN10*SN*", and enter the password "123456789" to connect to it.
- Open a browser and enter 192.168.200.1 in the address bar. Enter the username "admin" and the password "123456" to log in.



- The web interface of the receiver appears.

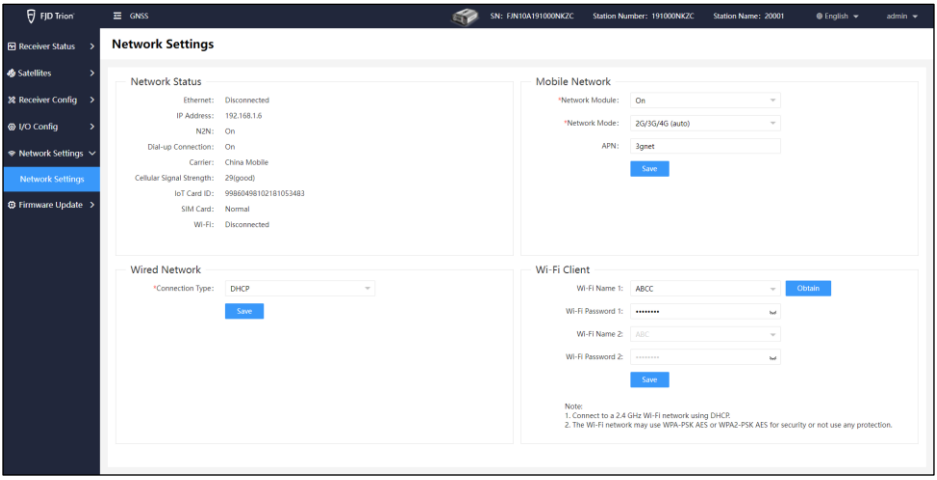


2.4.2 Configuring the Network

To check the Ethernet/4G/Wi-Fi network status of the receiver, choose Network Settings > Network Status.

Method 1 (DHCP):

- Use the network cable to connect the Ethernet port of the receiver to the Ethernet port of the router or switch.
- Go to Network Settings. Under Wired Network, set Connection Type to DHCP, and click Save. The settings take effect automatically.



Method 2 (static IP):

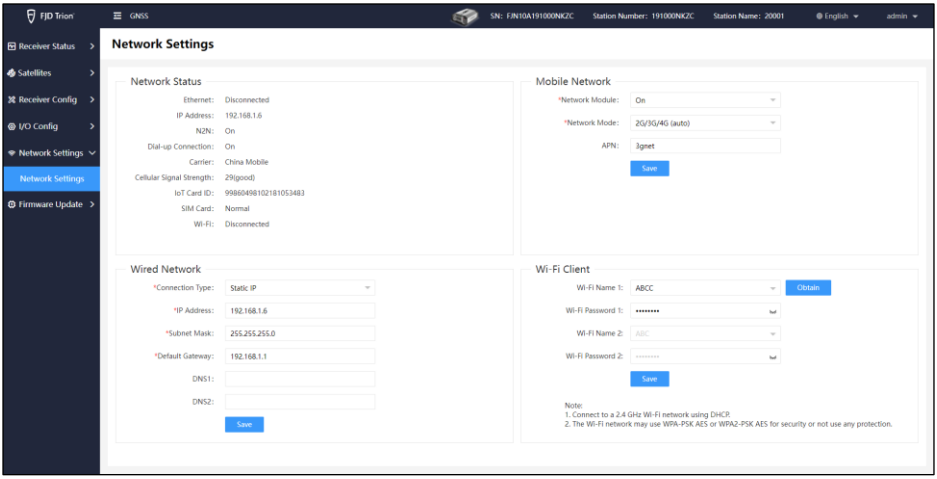
- Use the network cable to connect the network port of the PC to the Ethernet port of the router or switch.
- Open a browser and access any website to ensure that the network is working normally.
- Go to Settings > Network and Internet > Network and Sharing Center > Ethernet > Details in Windows 10 to access and record the IPv4 address, IPv4 subnet mask, IPv4 default gateway, and IPv4 DNS server information, which are required when configuring the wired network of the receiver. If you are using a different operating system, operations may vary slightly.
- Unplug the network cable from the PC and then plug it into the Ethernet port of the receiver via the network cable adapter.
- Go to Network Settings. Under Wired Network, set Connection Type to Static IP, enter the IP address, subnet mask, default gateway, and DNS information recorded above (enter DNS1 and retain the default value 8.8.8.8 for DNS2), and then click Save.

Method 3 (4G network):

- Use a hex wrench to remove the screws from the cover on the front panel of the receiver, take down the cover (put on the cover after installation and commissioning), and insert a micro-sized 4G IoT SIM card into the SIM card slot as instructed.
- Go to Network Settings. Under Mobile Network, set Network Module to On, and Network Mode to 2G/3G/4G (auto), enter the APN information provided by the carrier, and then click Save. The settings take effect immediately.

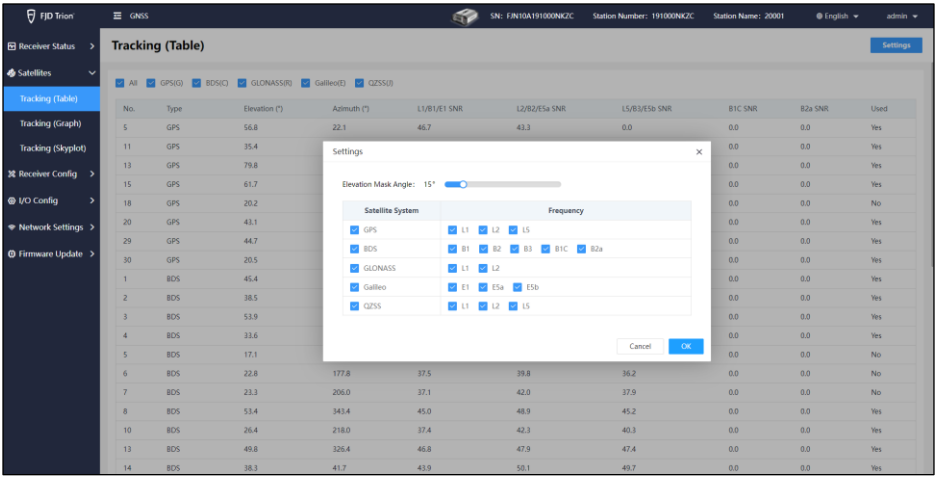
Method 4 (Wi-Fi network):

- Go to Network Settings. Under Wi-Fi Client, Click Obtain Wi-Fi Name 1 to select the target Wi-Fi name, enter the corresponding Wi-Fi password in Wi-Fi Password 1, and click Save.



2.4.3 Configuring the Satellites

- Choose Satellites > Tracking (Table) > Settings.
- Set Elevation Mask Angle to 15°, and click OK. The settings take effect immediately.

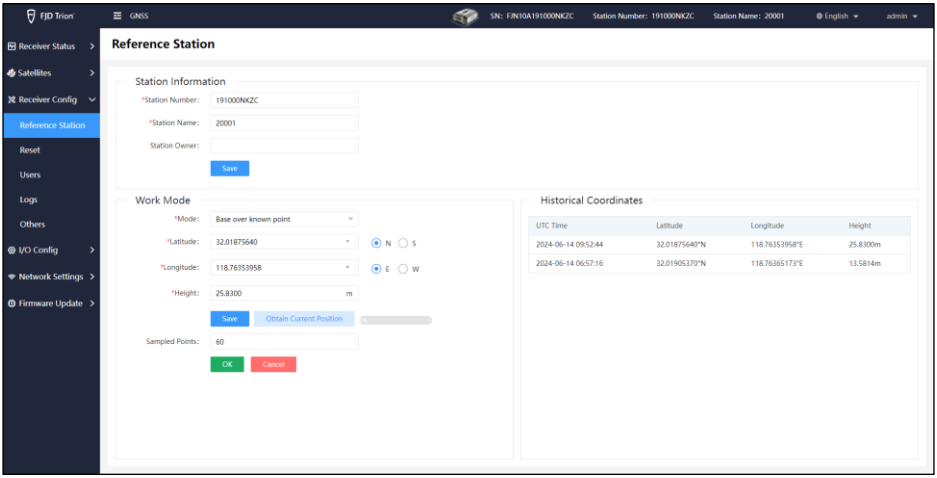


2.4.4 Configuring the Working Mode

- Choose Receiver Config > Reference Station. Under Work Mode, set Mode to Base over known point.

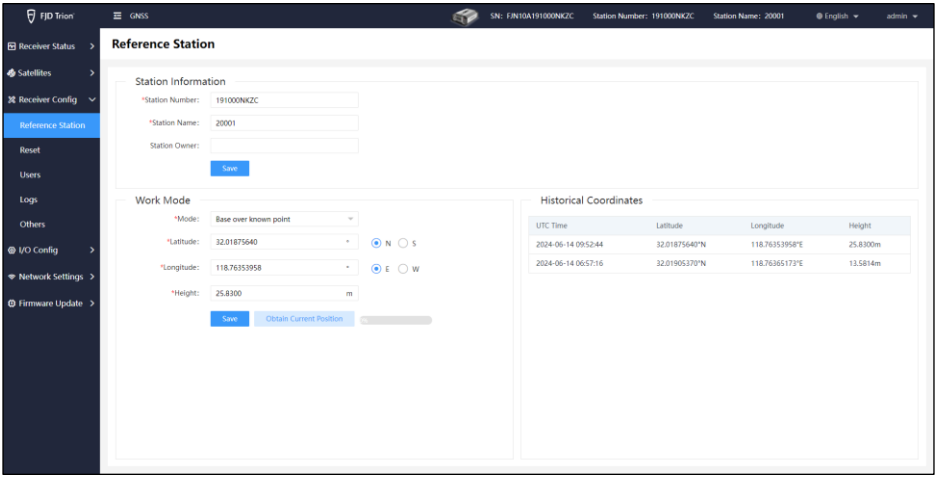
1. If the reference station position is unknown,

- Click Obtain Current Position, set the Sampled Points to a positive integer in the range of 1 to 10,000 (60 by default), and then click OK. After the sampling is complete, click Save.



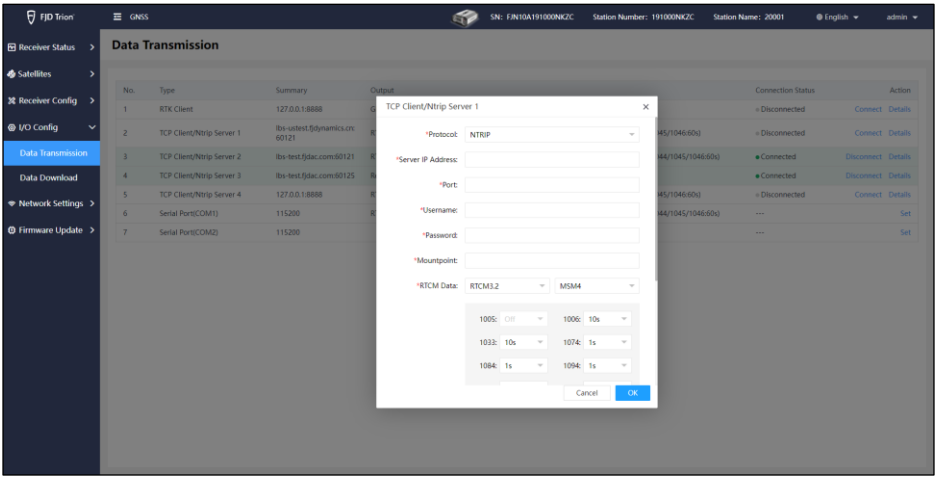
2. If the reference station position is known,

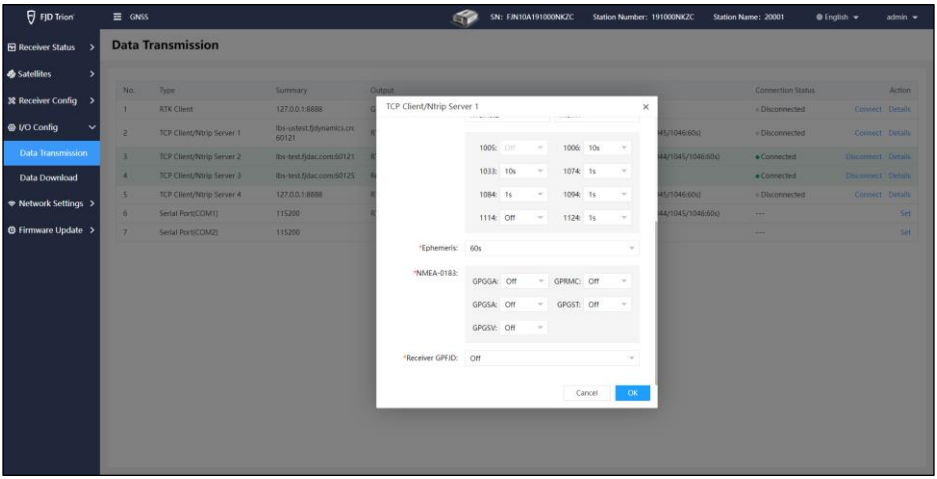
- Enter the latitude, longitude, and height, select N or S, select E or W, and then click Save.



2.4.5 Configuring Ntrip

- Choose I/O Config > Data Transmission, find TCP Client/Ntrip Server 1 (or any of the other three TCP Client/Ntrip Server links) in the list, and click Connect on the right. On the pop-up, set Protocol to NTRIP, enter the Ntrip Caster information provided by the FAE, including the server IP address, port, username, password, and mountpoint. Under RTCM Data, choose RTCM3.2 and MSM4， and set 1006 and 1033 to 10s, 1074, 1084, 1094, and 1124 to 1s, Ephemeris to 60s, and other settings to Off, and then click OK.





- After the above operations are complete, the FAE will inform you whether the receiver configuration is successful.

3 Web Interface

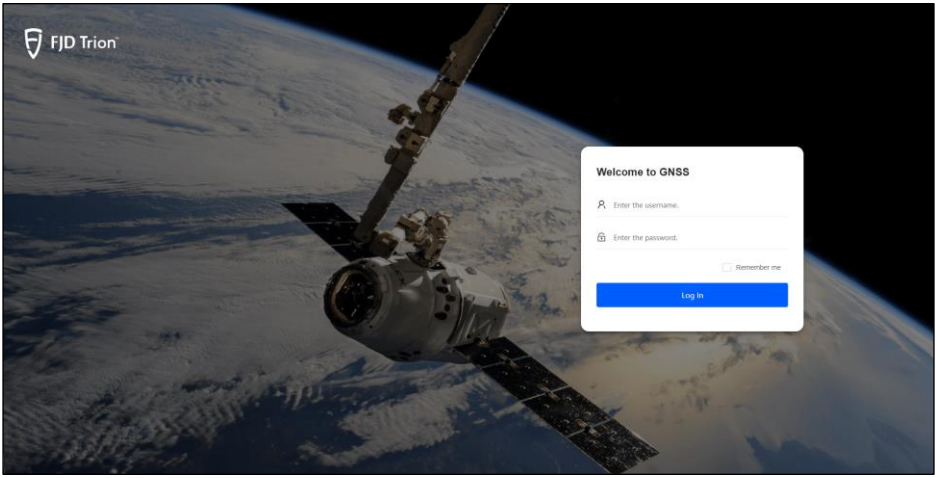
You can access the web interface of the N10 receiver through wired LAN and Wi-Fi.

Method 1: wired LAN

Check and set the receiver IP address on the front panel. Use the network cable to connect the Ethernet port of the receiver (via the network cable adapter) to the network port of the PC. Open a browser on your PC, and enter the receiver IP address in the address bar. Ensure that the IP addresses of the PC and the receiver are on the same subnet.

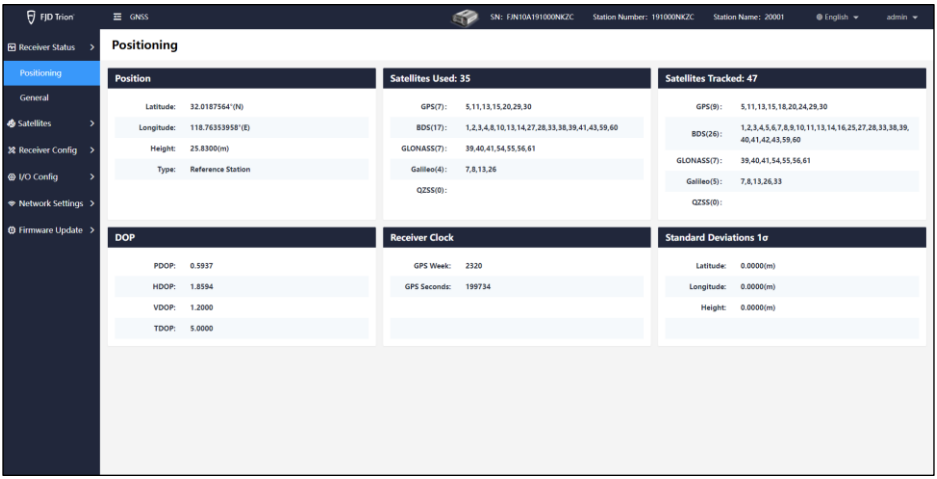
Method 2: Wi-Fi (recommended)

Enable Wi-Fi on the PC, find the receiver Wi-Fi "FJN10*SN*", and enter the password "123456789" to connect to it. Open a browser and enter 192.168.200.1 in the address bar.



Enter the username "admin" and the password "123456". By checking Remember me, you can log in automatically the next time you enter the right IP address in the browser address bar.

Click Log In to access the web interface of the N10 receiver. The interface consists of six modules: Receiver Status, Satellites, Receiver Config, I/O Config, Network Settings, and Firmware Update.



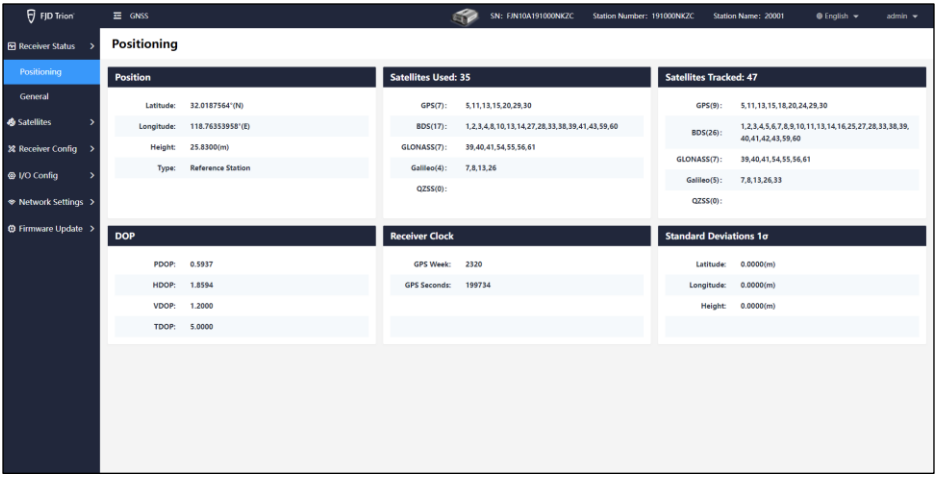
3.1 Receiver Status

This module consists of two parts: Positioning and General.

3.1.1 Positioning

This part shows the satellite data received by the receiver.

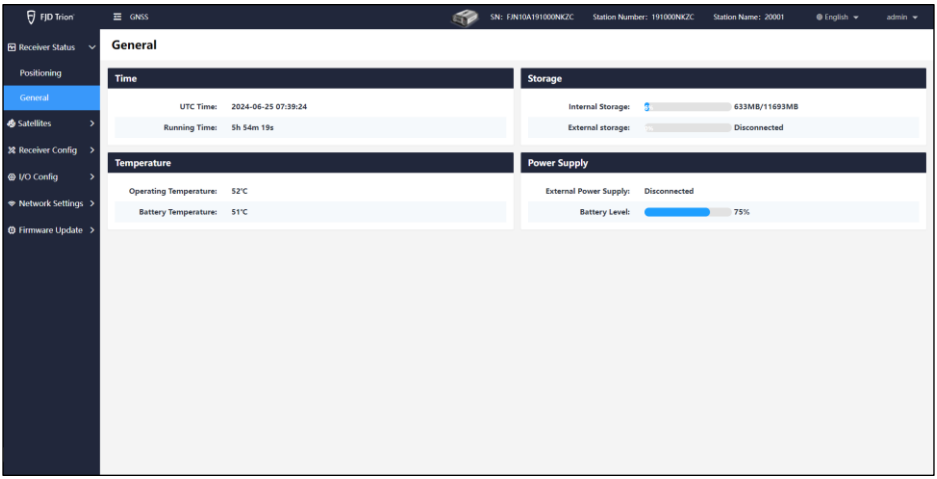
- Position: position of the receiver antenna and receiver work mode.
- Satellites Used: number of satellites used by the receiver.
- Satellites Tracked: number of satellites tracked by the receiver.
- DOP: DOP values of the receiver position.
- Receiver Clock: GPS time of the receiver.
- Standard Deviation 1σ: receiver position errors.



3.1.2 General

This part shows the general information of the receiver.

- Time: UTC time and total running time of the receiver.
- Storage: internal and external storage capacities of the receiver.
- Temperature: operating temperature and battery temperature of the receiver.
- Power Supply: power supply of the receiver, including the external power supply status and battery level.

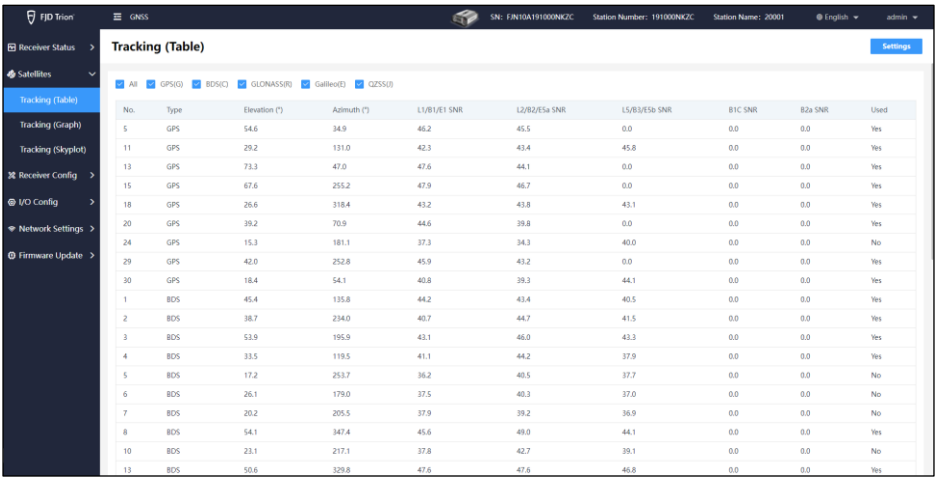


3.2 Satellites

This part shows the satellite tracking status of the receiver in the form of table, graph, and skyplot.

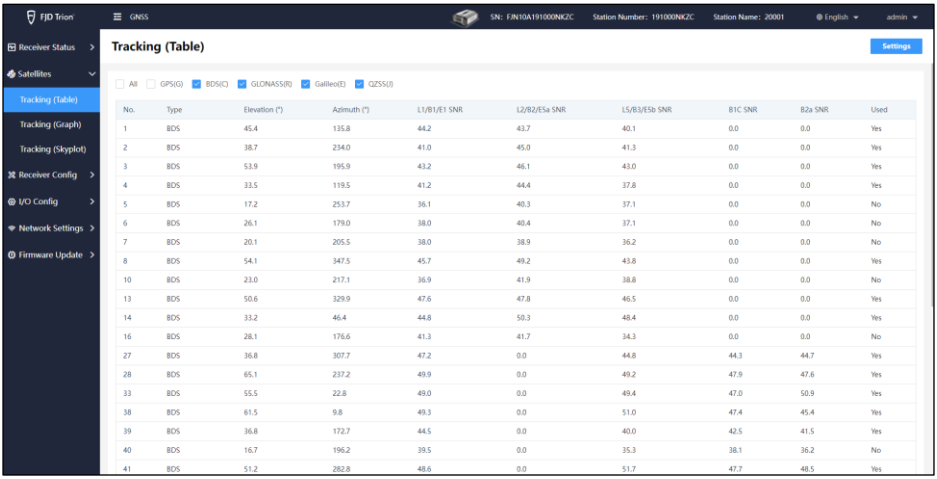
3.2.1 Tracking (Table)

The Tracking (Table) page shows the details of satellites from five constellations, namely GPS, BDS, GLONASS, Galileo, and QZSS, tracked by the receiver in a table, including the satellite number, elevation angle, azimuth angle, and signal to noise ratio (SNR).



No.	Type	Elevation (°)	Azimuth (°)	L1/B1/E1 SNR	L2/B2/E5a SNR	L5/B3/E5b SNR	B1C SNR	B2a SNR	Used
5	GPS	54.6	34.9	46.2	45.5	0.0	0.0	0.0	Yes
11	GPS	29.2	131.0	42.3	43.4	45.8	0.0	0.0	Yes
13	GPS	73.3	47.0	47.6	44.1	0.0	0.0	0.0	Yes
15	GPS	67.6	255.2	47.9	46.7	0.0	0.0	0.0	Yes
18	GPS	26.6	318.4	43.2	43.8	43.1	0.0	0.0	Yes
20	GPS	39.2	70.9	44.6	39.8	0.0	0.0	0.0	Yes
24	GPS	15.3	181.1	37.3	34.3	40.0	0.0	0.0	No
29	GPS	42.0	252.8	45.9	43.2	0.0	0.0	0.0	Yes
30	GPS	18.4	54.1	40.8	39.3	44.1	0.0	0.0	Yes
1	BDS	45.4	135.8	44.2	43.4	40.5	0.0	0.0	Yes
2	BDS	38.7	234.0	40.7	44.7	41.5	0.0	0.0	Yes
3	BDS	53.9	195.9	43.1	46.0	43.3	0.0	0.0	Yes
4	BDS	33.5	119.5	41.1	44.2	37.9	0.0	0.0	Yes
5	BDS	17.2	253.7	36.2	40.5	37.7	0.0	0.0	No
6	BDS	26.1	179.0	37.5	40.3	37.0	0.0	0.0	No
7	BDS	20.2	205.5	37.9	39.2	36.9	0.0	0.0	No
8	BDS	54.1	347.4	45.6	49.0	44.1	0.0	0.0	Yes
10	BDS	23.1	217.1	37.8	42.7	39.1	0.0	0.0	No
13	BDS	50.6	329.8	47.6	47.6	46.8	0.0	0.0	Yes

Select or deselect check boxes to show or hide the satellite system data.



No.	Type	Elevation (°)	Azimuth (°)	L1/B1/E1 SNR	L2/B2/E5a SNR	L5/B3/E5b SNR	B1C SNR	B2a SNR	Used
1	BDS	45.4	135.8	44.2	43.7	40.1	0.0	0.0	Yes
2	BDS	38.7	234.0	41.0	45.0	41.3	0.0	0.0	Yes
3	BDS	53.9	195.9	43.2	46.1	43.0	0.0	0.0	Yes
4	BDS	33.5	119.5	41.2	44.4	37.8	0.0	0.0	Yes
5	BDS	17.2	253.7	36.1	40.3	37.1	0.0	0.0	No
6	BDS	26.1	179.0	38.0	40.4	37.1	0.0	0.0	No
7	BDS	20.1	205.5	38.0	38.9	36.2	0.0	0.0	No
8	BDS	54.1	347.5	45.7	49.2	43.8	0.0	0.0	Yes
10	BDS	23.0	217.1	36.9	41.9	38.8	0.0	0.0	No
13	BDS	50.6	329.9	47.6	47.8	46.5	0.0	0.0	Yes
14	BDS	33.2	46.4	44.8	50.3	48.4	0.0	0.0	Yes
16	BDS	28.1	176.6	41.3	41.7	34.3	0.0	0.0	No
27	BDS	36.8	307.7	47.2	0.0	44.8	44.3	44.7	Yes
28	BDS	65.1	237.2	49.9	0.0	49.2	47.9	47.6	Yes
33	BDS	55.5	22.8	49.0	0.0	49.4	47.0	50.9	Yes
38	BDS	61.5	9.8	49.3	0.0	51.0	47.4	45.4	Yes
39	BDS	36.8	172.7	44.5	0.0	40.0	42.5	41.5	Yes
40	BDS	16.7	196.2	39.5	0.0	35.3	38.1	36.2	No
41	BDS	51.2	282.8	48.6	0.0	51.7	47.7	48.5	Yes

3.2.2 Tracking (Graph)

The Tracking (Graph) page shows the details of the satellites tracked by the receiver in a bar graph.

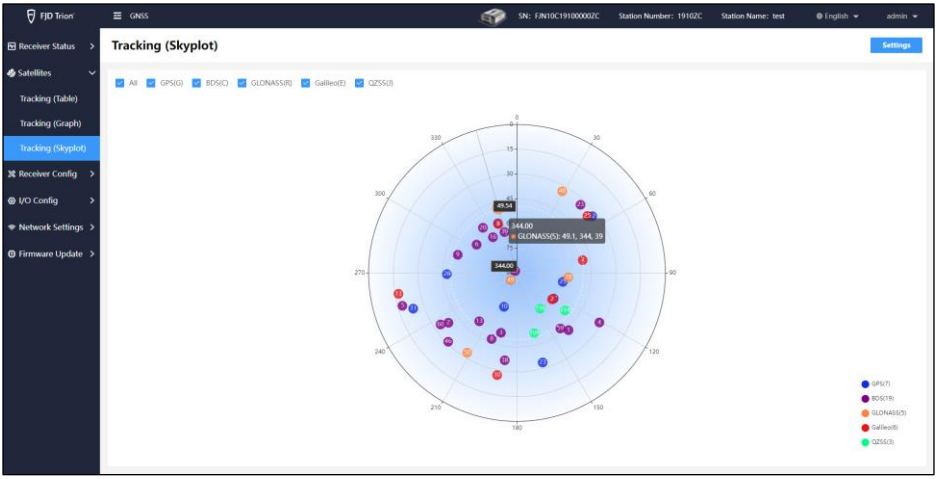
When your cursor points at a point on the bar graph, the system shows the SNR of a satellite tracked by the receiver.

Select or deselect check boxes to show or hide the satellite system data.

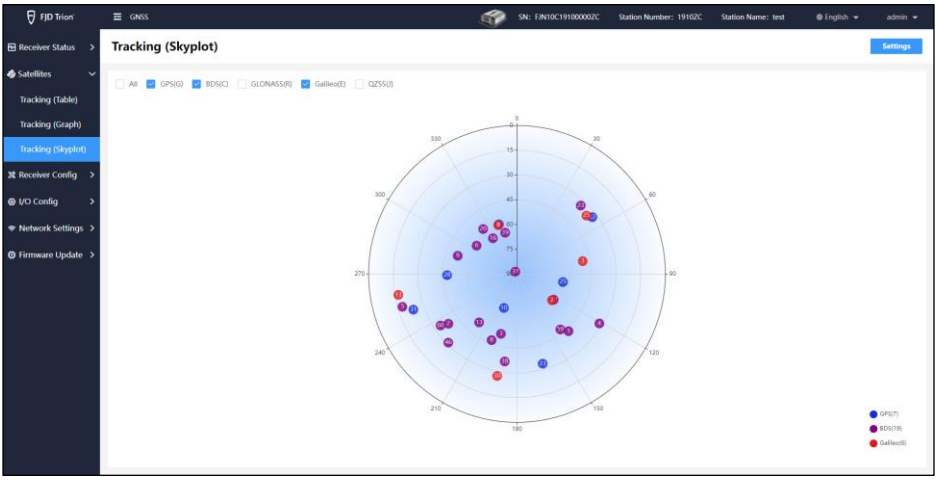
Use the bottom slider to zoom in or out on the bar graph.

3.2.3 Tracking (Skyplot)

The Tracking (Skyplot) page shows the details of the satellites tracked by the receiver in a skyplot. When your cursor points at a point on the skyplot, the system shows the number of satellites tracked, azimuth angle, elevation angle, and SNR.

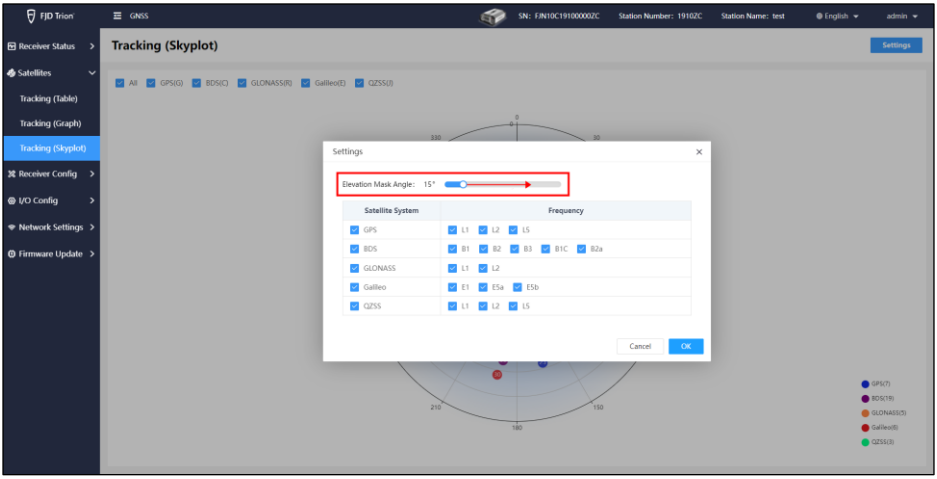


Select or deselect check boxes to show or hide the satellite system data.

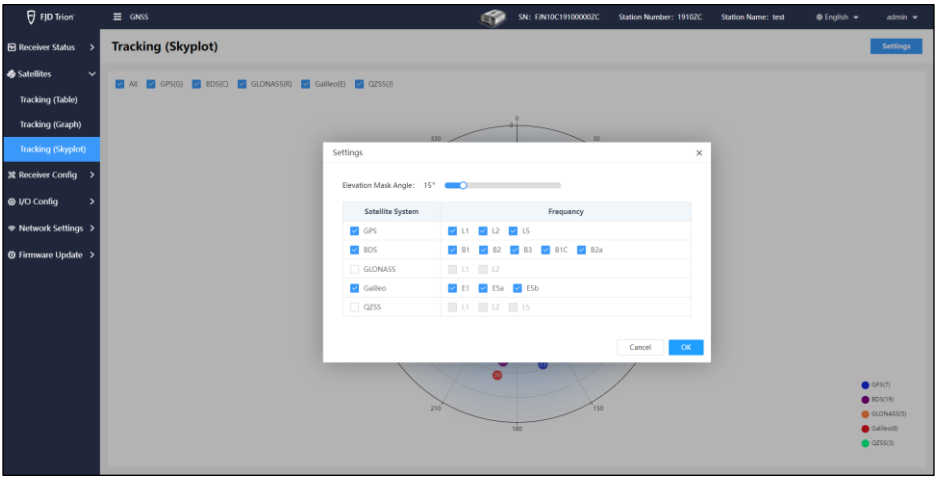


3.2.4 Settings

Click Settings to set the elevation mask angle, satellite system, and frequency information of satellites tracked by the receiver. You can adjust the elevation mask angle in the range of 0°–90° by the slider. The default angle is 5°.



Select or deselect the satellite system and frequency band check boxes to set frequencies of satellites tracked by the receiver.



3.3 Receiver Config

This module allows for working mode configuration and operation management of the receiver.

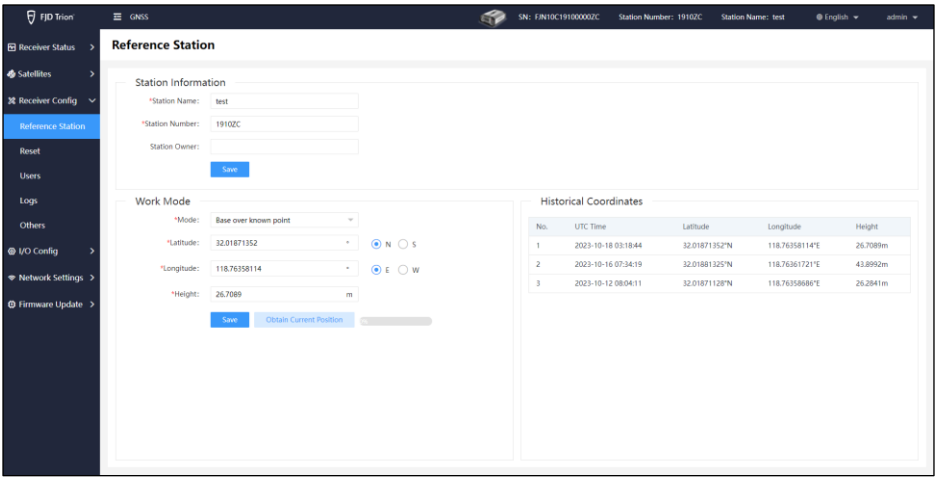
3.3.1 Reference Station

Set the receiver to work as a reference station or a rover. No modification is required to the default station information.

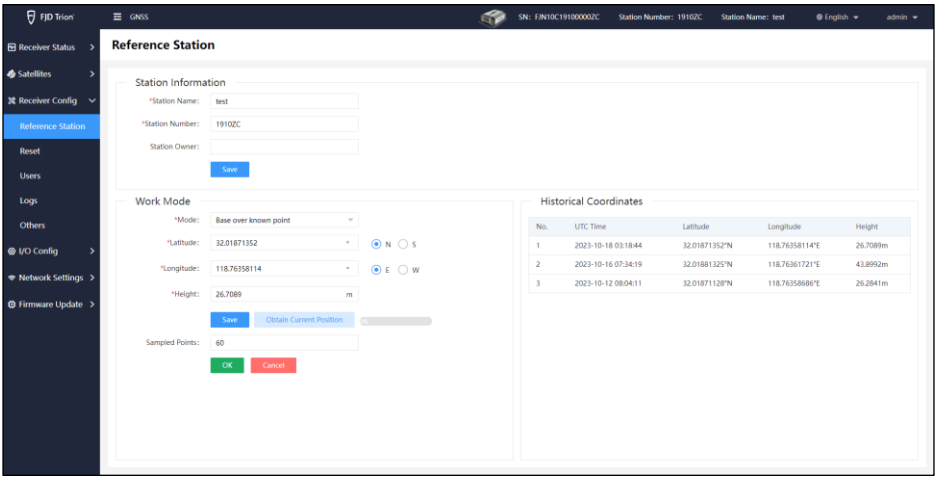
1. Set the reference station mode

- Mode: Select Base over known point.
- Latitude and Longitude: Enter a positive value with 8 decimal places, select N or S, and then select E or W.
- Height: Enter the geodetic height with 4 decimal places.

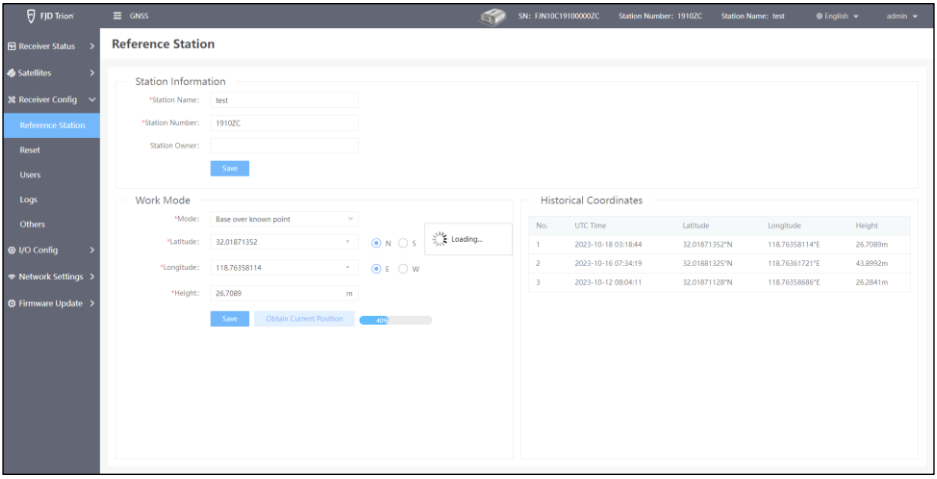
Ensure that all above data is correct, and click Save. The reference station mode is enabled immediately.



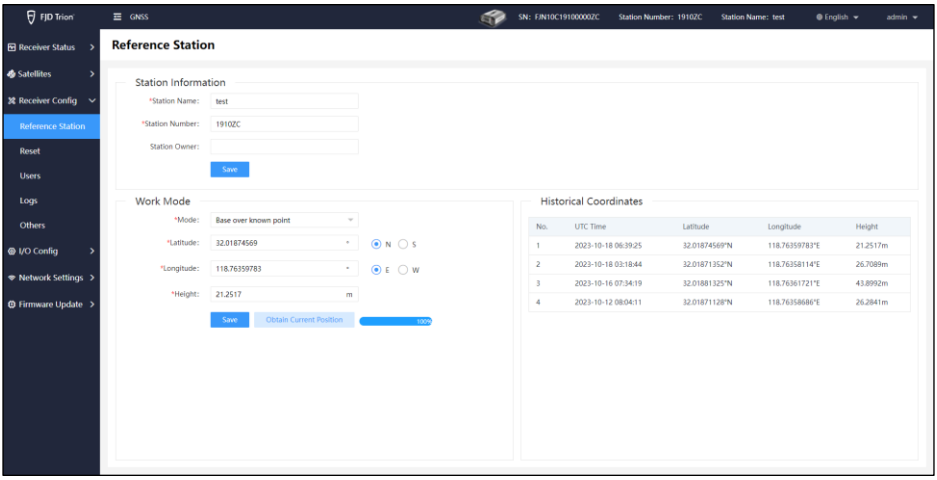
If the current receiver position is unknown, click Obtain Current Position, and set Sampled Points to a positive integer in the range of 1 to 10,000 (60 by default). The sampling frequency is once per second.



Click OK. When the sampling is complete, the system automatically enters the latitude, longitude, and height values.

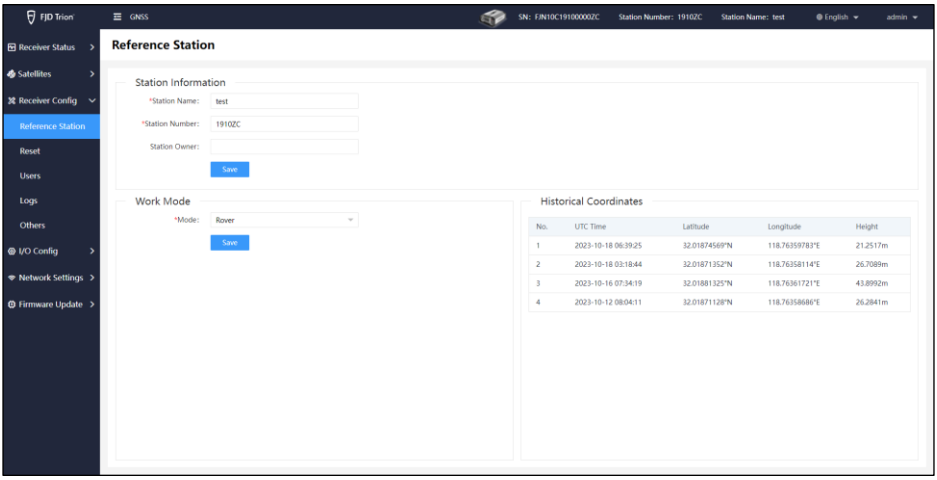


Click Save. The reference station mode is set.



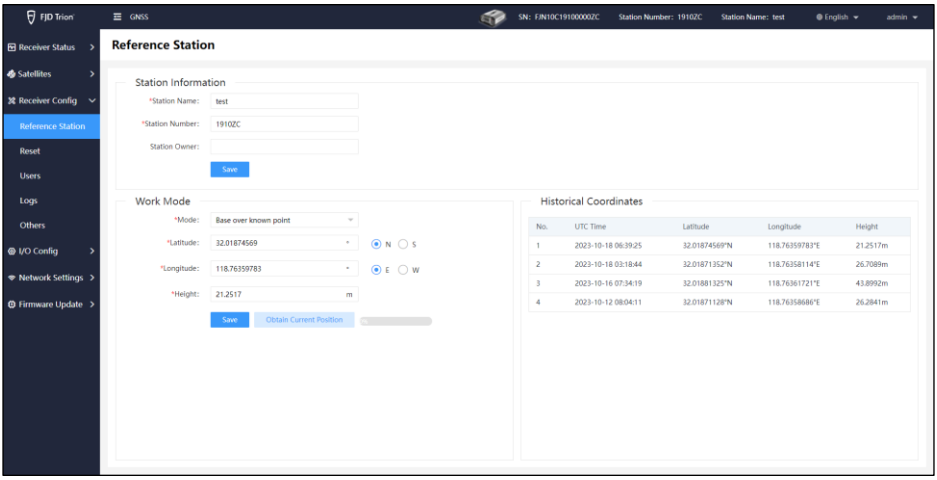
2. Set the rover mode

Set Mode to Rover, and click Save. The rover mode is set.



3. Historical Coordinates

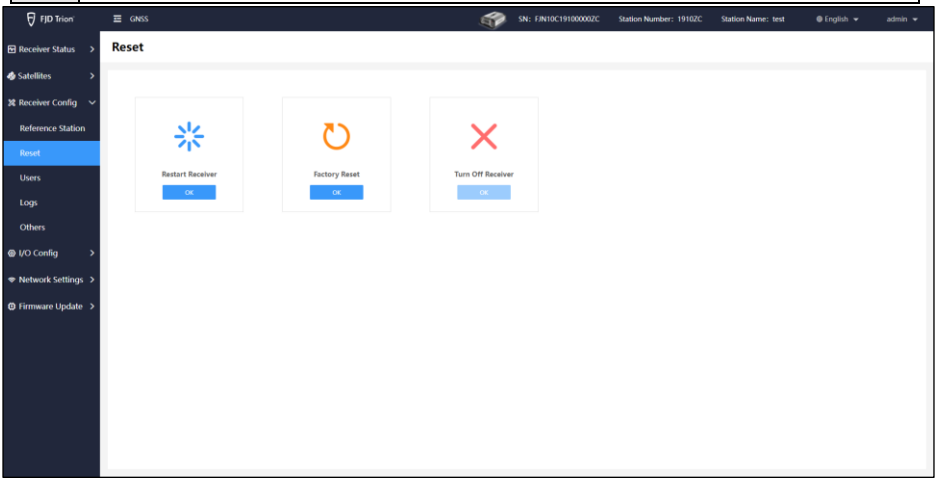
The historical latitudes, longitudes, and heights of the receiver recorded in the reference station mode are shown for future reference.



3.3.2 Reset

Restart, factory reset, or turn off the receiver here.

!	Note: You cannot turn off the receiver here if an external power supply is used.



The following changes occur on the web interface after a factory reset.

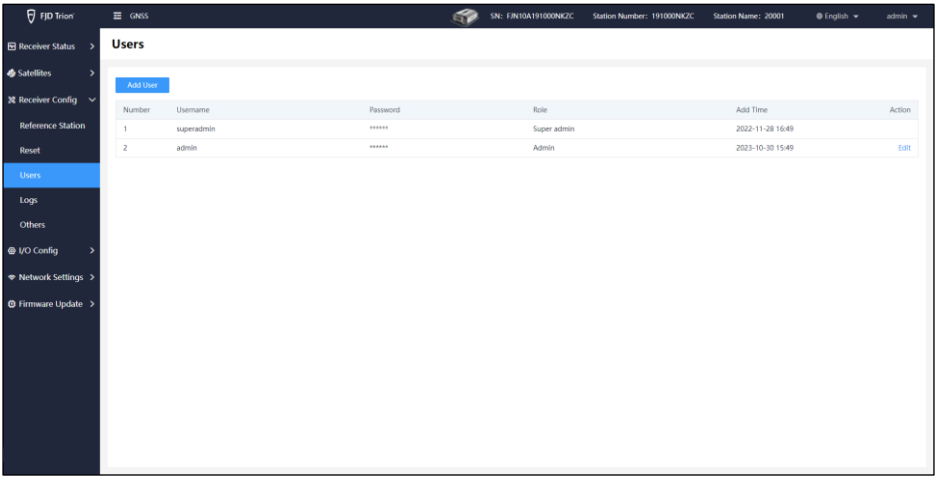
1. Under Receiver Status and Satellites, all GNSS data fields (such as satellite type, satellite number, azimuth angle, elevation angle, and SNR) are empty. The elevation mask angle becomes 5° on the Settings screen.
2. On the Reference Station screen, under Work Mode, the latitude, longitude, and height values become zero while other data remains unchanged, when Mode is set to Base over known point.

No changes are made when Mode is set to Rover.

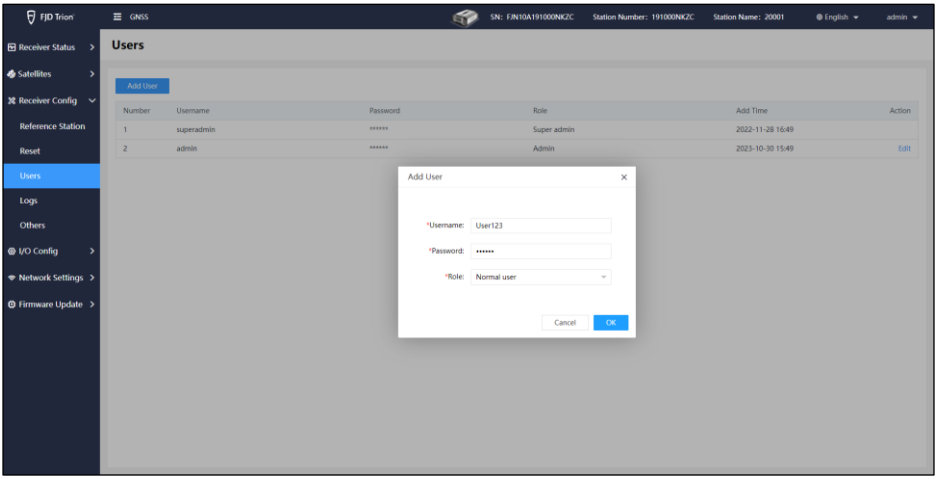
3. On the Others screen, interface settings are off while other data remains unchanged.
4. In I/O Config > Data Transmission, the RTK Client and TCP Client/Ntrip Servers are disconnected, and other data (Summary and Output) remains unchanged; the serial port (COM1) mode is set to serial port direct communication and the serial port (COM2) output is empty. Data download is still available.

3.3.3 Users

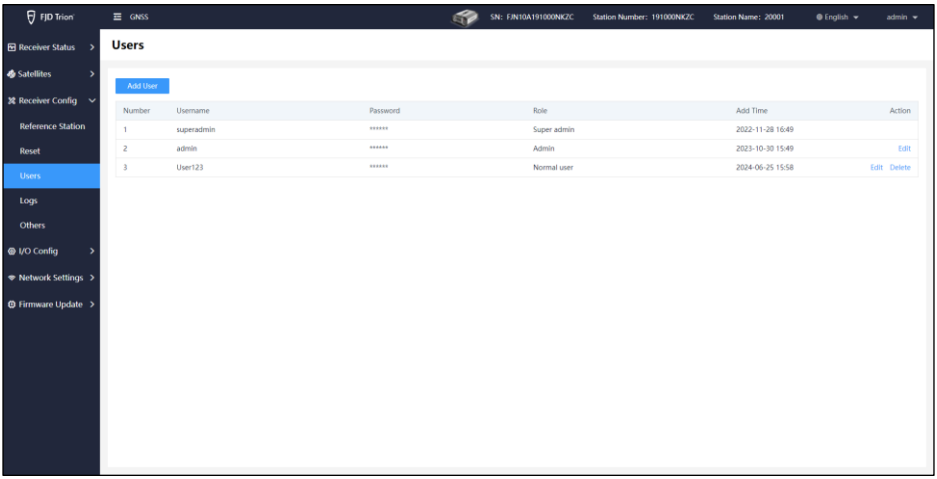
Users can be assigned different access to the receiver here.



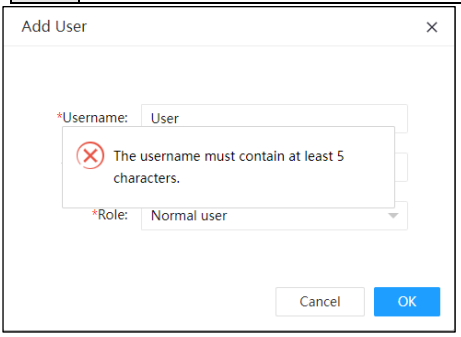
Click Add User, enter the username and password, and then select a role.

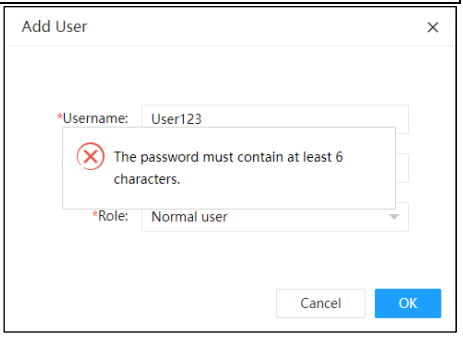


Click OK to add the user.



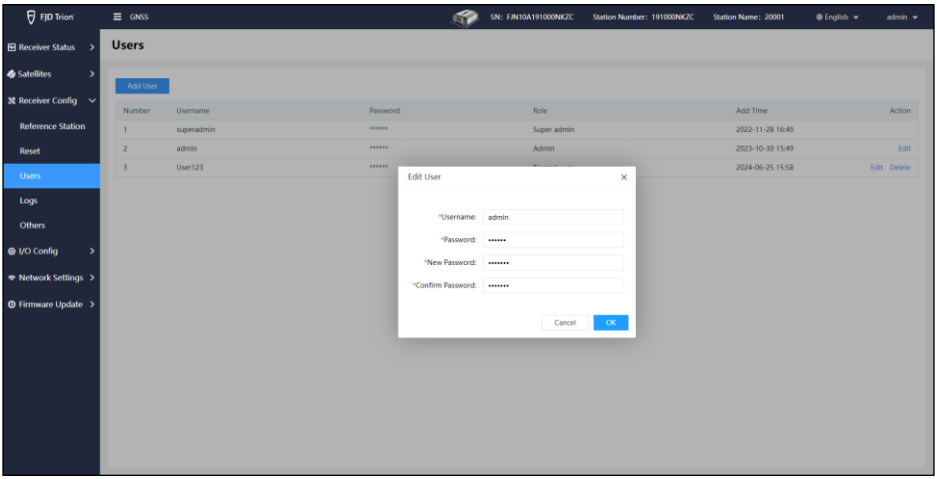
!	Note: The username and password must contain at least 5 and 6 characters respectively.





Normal admin:

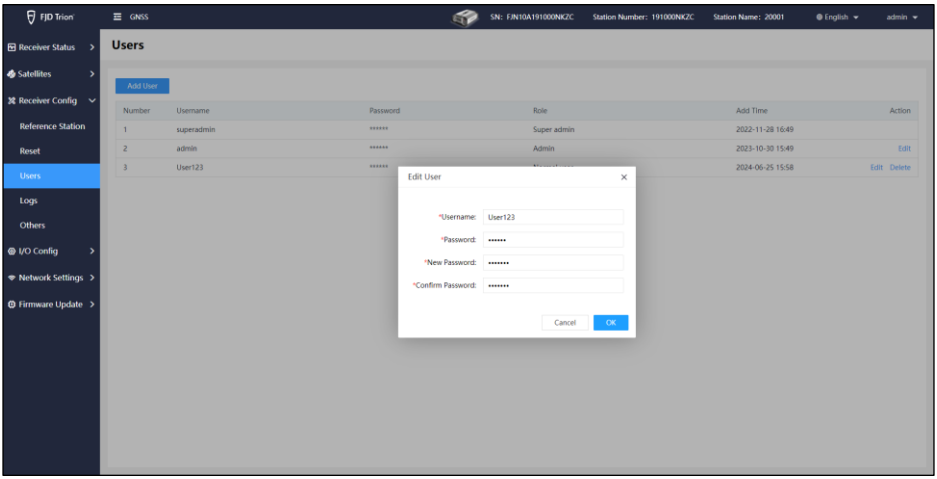
Click Edit to change the username and password.



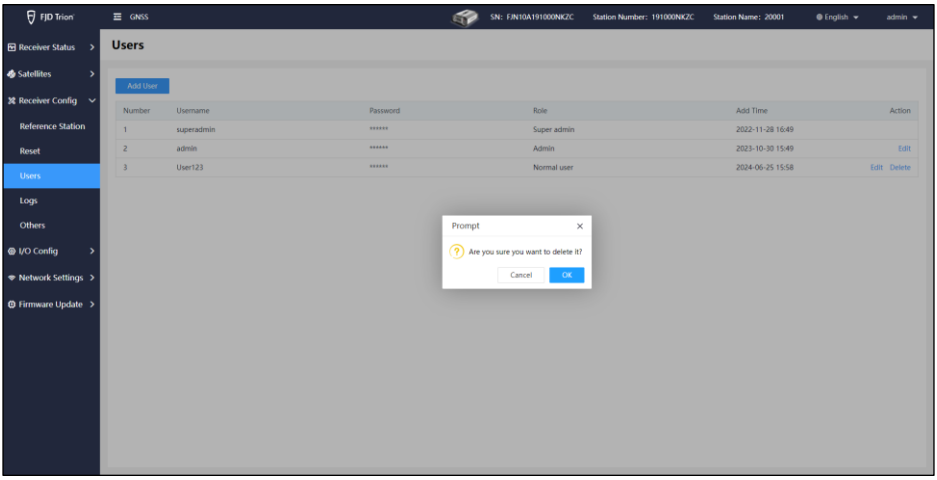
!	Note: The super admin user cannot be deleted.

Normal user:

Click Edit to change the username and password.

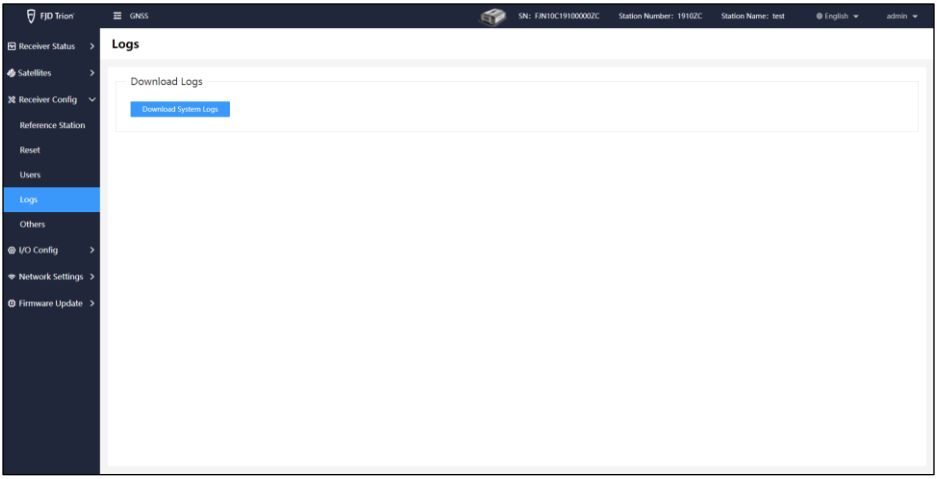


Click Delete, and click OK or Cancel on the pop-up.

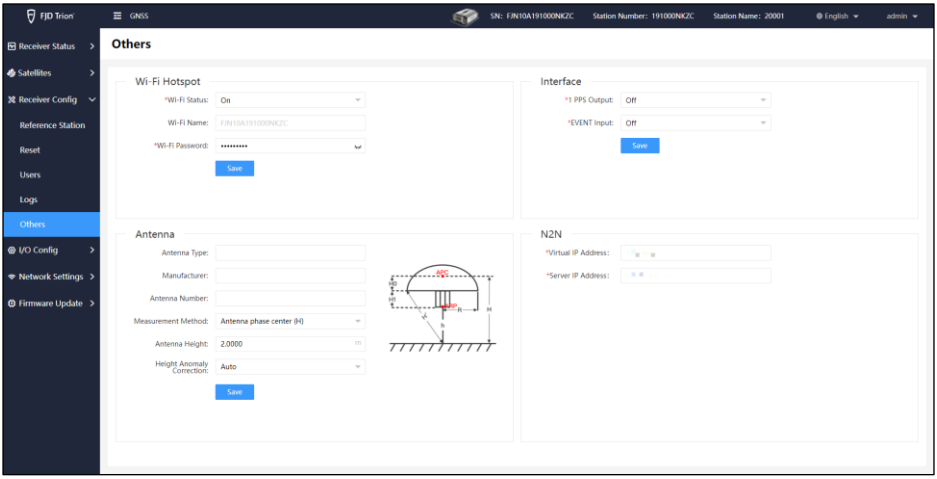


3.3.4 Logs

This feature records the running status of the receiver. Click Download System Logs, and specify the storage path. The system automatically downloads logs.



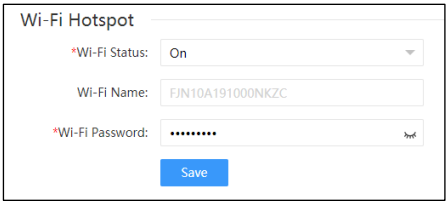
3.3.5 Others



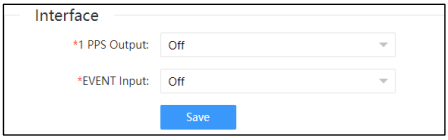
Set the receiver Wi-Fi hotspot under Wi-Fi Hotspot.

- Wi-Fi Status: Select On or Off. The default status is On.
- Wi-Fi Name: receiver SN by default, which cannot be changed.
- Wi-Fi Password: 123456789 by default, which can be changed.

When Wi-Fi Status is On, set parameters and click Save.



On or off external interfaces (1 PPS Output and Event Input) of the receiver under Interface, and click Save.

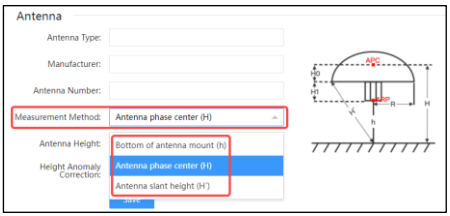


Set the external antenna connected to the receiver under Antenna.

- Antenna Type, Manufacturer, and Antenna Number: Enter information based on facts.
- Measurement Method: Bottom of antenna mount (h), Antenna phase center (H), or Antenna slant height (H').
- Antenna Height: Enter the value measured with one of the above methods.

- Height Anomaly Correction: Auto by default. You can change the setting to any value with up to 4 decimal places.

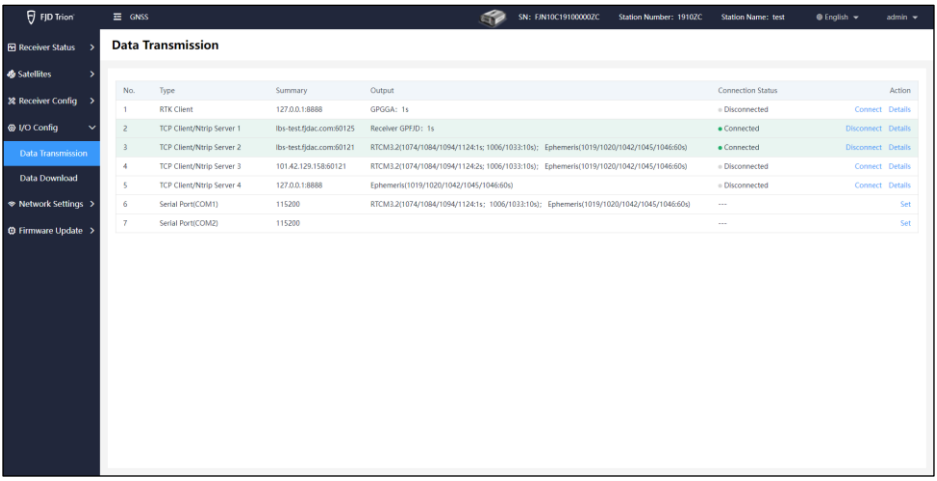
Click Save.



N2N information retains the factory settings.

3.4 I/O Config

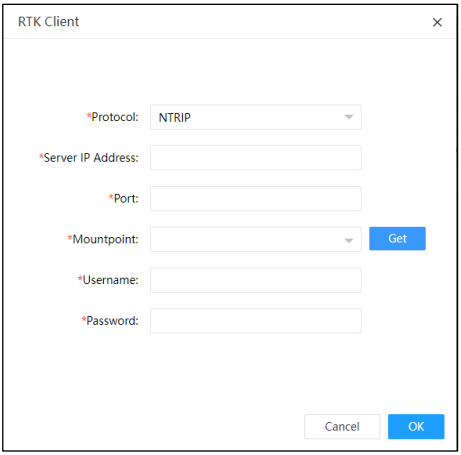
In this module, you can set data transmission and storage, and download data when the receiver works in the reference station or rover mode.



3.4.1 RTK Client

This feature is available when the receiver is in rover mode.

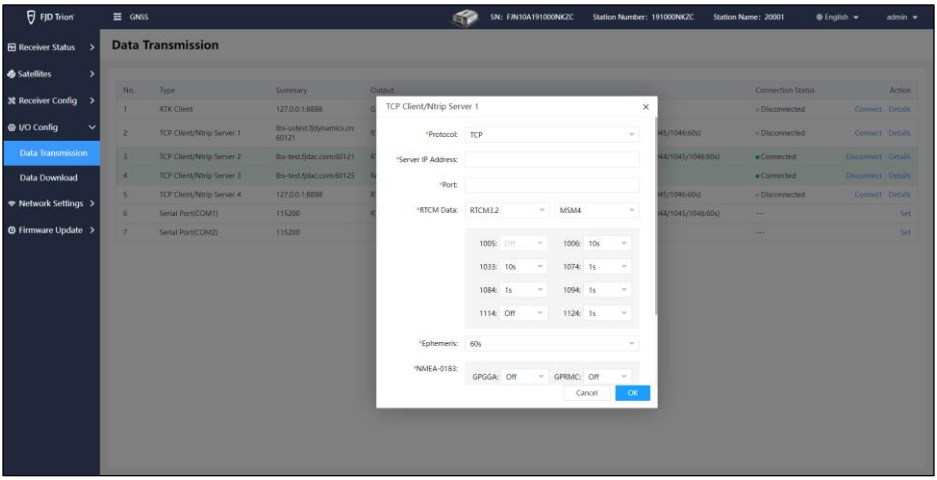
The protocol is NTRIP by default. Enter the server IP address, port, mountpoint, username, and password based on your account information, and click OK. The settings take effect immediately.



3.4.2 TCP Client/Ntrip Server

This feature supports synchronous data transmission via four links. The available protocols are TCP and NTRIP.

1. Set Protocol to TCP.



- Enter the server IP address and port as required.
- RTCM Data: Set RTCM3.0, RTCM3.2(MSM4), RTCM3.2(MSM5), or Off.

① RTCM3.0: Set 1005,1006, and 1033 to 10s or Off, and 1004 and 1012 to 1s or Off.

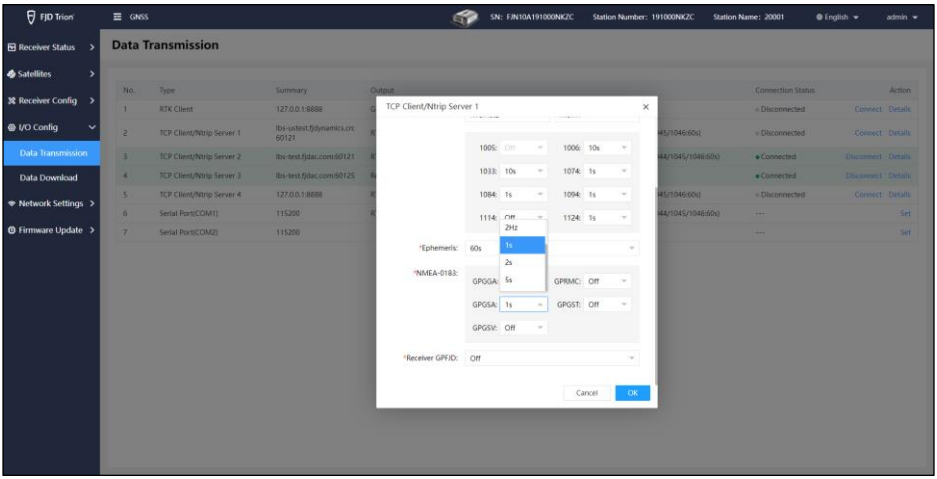
② RTCM3.2(MSM4): Set 1005,1006, and 1033 to 10s or Off, and 1074, 1084, 1094, 1114, and 1124 to 1s, 2s, or Off.

③ RTCM3.2(MSM5): Set 1005, 1006, 1013, and 1033 to 10s or Off, and 1075, 1085, 1095, 1115, and 1125 to 1s, 2s, or Off.

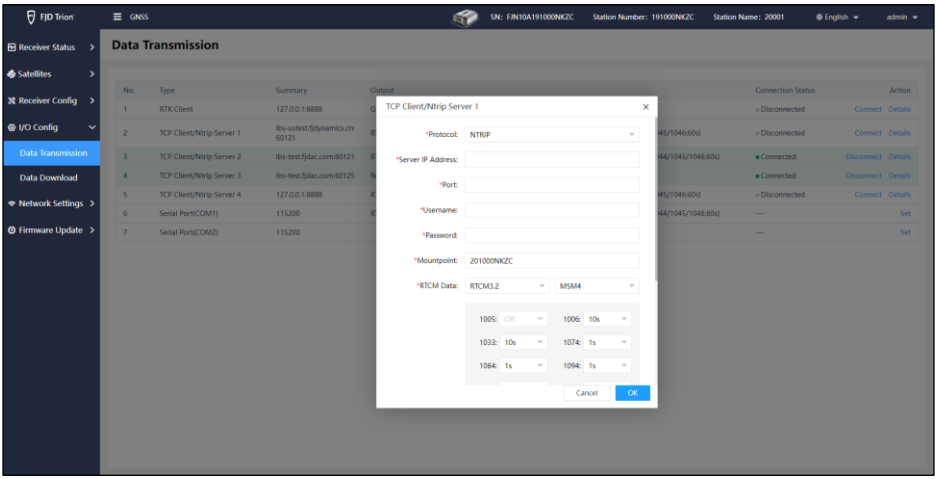
④ 1005 and 1006 are mutually exclusive options. Please choose one of them.

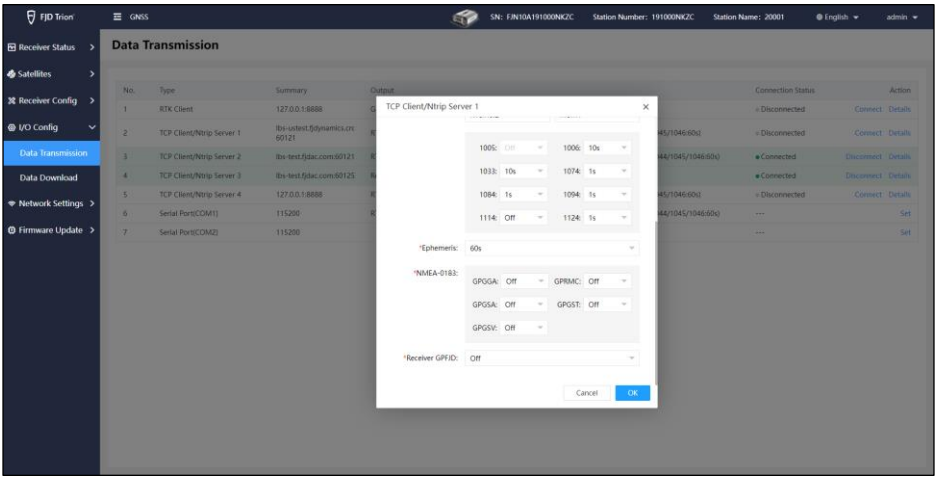
- Ephemeris: Select 60s or Off.
- NMEA-0183: Set GPGGA, GPGSA, GPGST, GPGSV, and GPRMC to 5Hz, 2Hz, 1s, 2s, 5s, or Off.
- Receiver GPFJD: Select 1s, 2s, 5s, or Off.

Set the above parameters, and click OK. The settings take effect immediately.



2. Set Protocol to NTRIP.





- Enter the server IP address, port, username, password, and mountpoint based on the NTRIP CASTER configuration.
- RTCM Data: Set RTCM3.0, RTCM3.2(MSM4), RTCM3.2(MSM5), or Off.

① RTCM3.0: Set 1005,1006, and 1033 to 10s or Off, and 1004 and 1012 to 1s or Off.

② RTCM3.2(MSM4): Set 1005,1006, and 1033 to 10s or Off, and 1074, 1084, 1094, 1114, and 1124 to 1s, 2s, or Off.

③ RTCM3.2(MSM5): Set 1005, 1006, 1013, and 1033 to 10s or Off, and 1075, 1085, 1095, 1115, and 1125 to 1s, 2s, or Off.

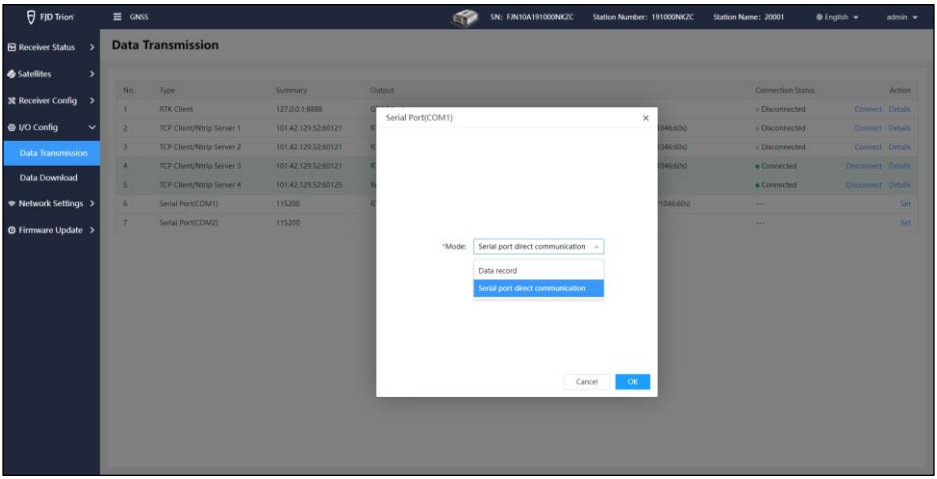
④ 1005 and 1006 are mutually exclusive options. Please choose one of them.

- Ephemeris: Select 60s or Off.
- NMEA-0183: Set GPGGA, GPGSA, GPGST, GPGSV, and GPRMC to 5Hz, 2Hz, 1s, 2s, 5s, or Off.
- Receiver GPFJD: Select 1s, 2s, 5s, or Off.

Set the above parameters, and click OK. The settings take effect immediately. Refer to section 2.4.5 for details.

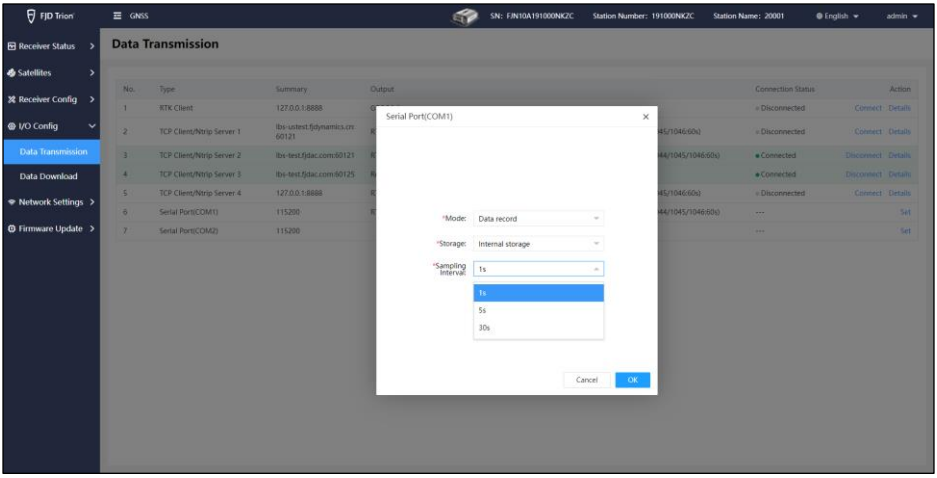
3.4.3 Serial Port (COM1)

Two modes (choose one out of two), namely Data record and Serial port direct communication, are supported.

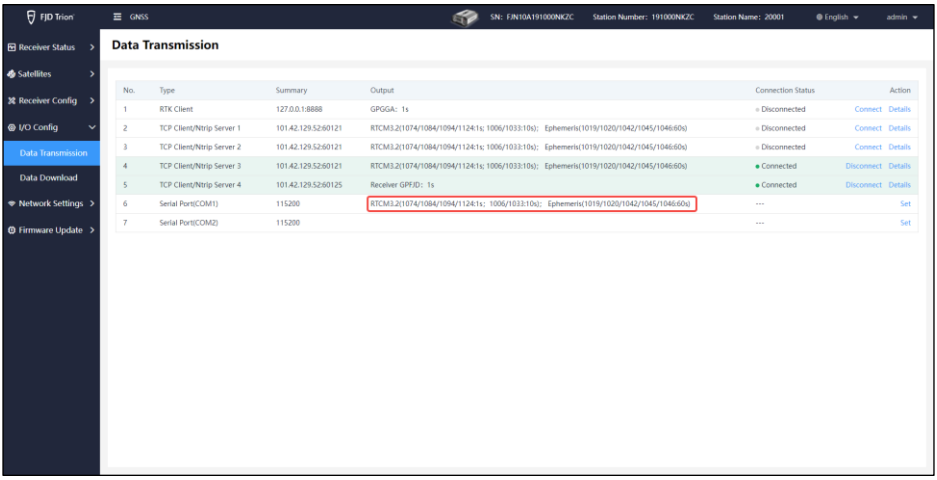


Mode 1: Data record

This mode allows recording the RTCM data of the receiver locally. Set Storage Location to Internal memory or External memory, and set Sampling Interval to 1s, 5s, or 30s, then click OK. The settings take effect immediately.

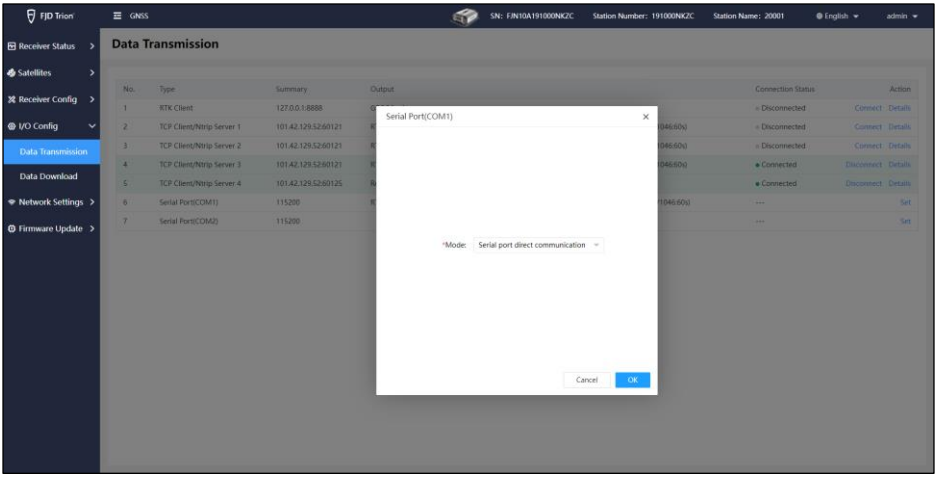


Data recorded is shown in the red box below.

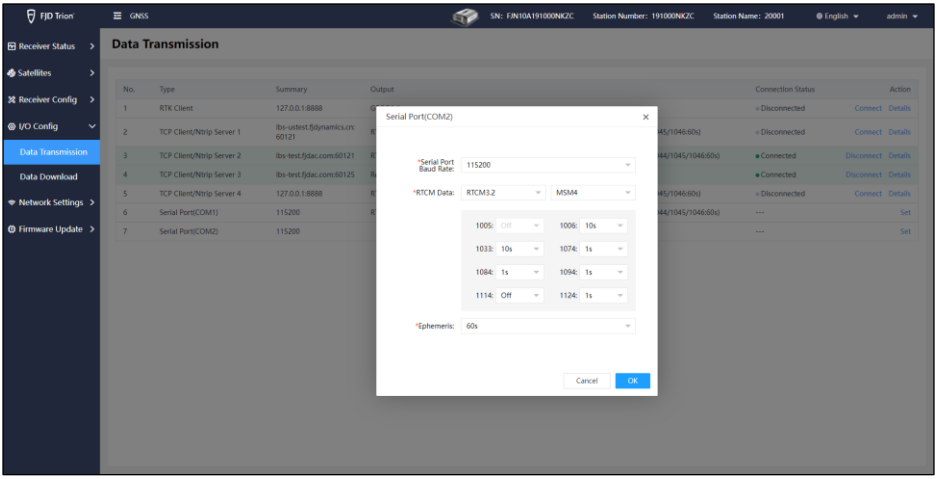


Mode 2: Serial port direct communication

This mode allows for data exchange with the GNSS board through an RS232 cable connected to the COM1 port on the rear panel of the receiver. Set Mode to Serial port direct communication, and click OK.



3.4.4 Serial Port (COM2)



- Serial Port Baud Rate: Select 9600, 19200, 38400, 57600, or 115200.
- RTCM Data: Set RTCM3.0, RTCM3.2(MSM4), RTCM3.2(MSM5), or Off.

① RTCM3.0: Set 1005,1006, and 1033 to 10s or Off, and 1004 and 1012 to 1s or Off.

② RTCM3.2(MSM4): Set 1005,1006, and 1033 to 10s or Off, and 1074, 1084, 1094, 1114, and 1124 to 1s, 2s, or Off.

③ RTCM3.2(MSM5): Set 1005, 1006, 1013, and 1033 to 10s or Off, and 1075, 1085, 1095, 1115, and 1125 to 1s, 2s, or Off.

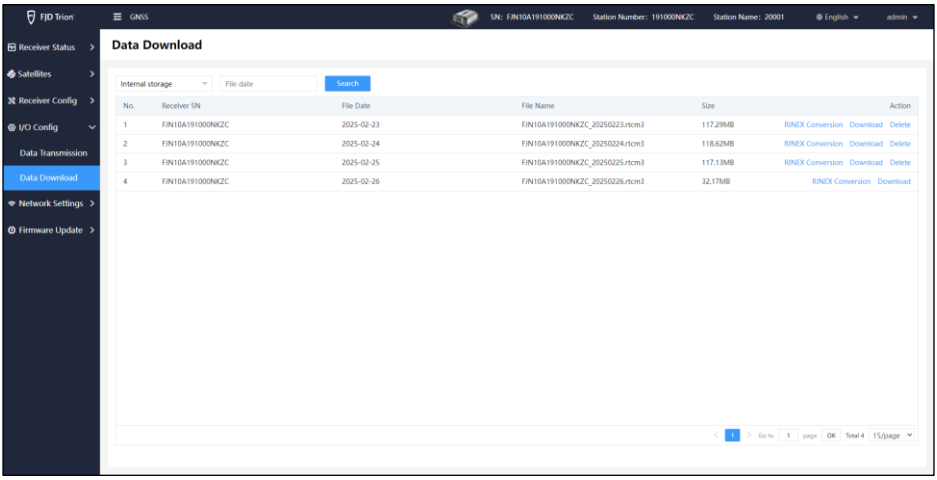
④ 1005 and 1006 are mutually exclusive options. Please choose one of them.

- Ephemeris: Select 60s or Off.

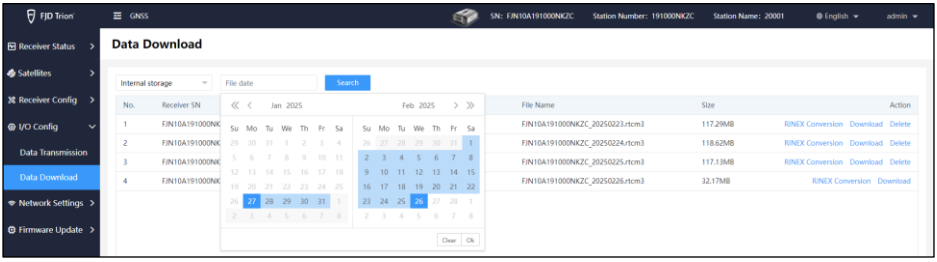
Set the above parameters, and click OK. The settings take effect immediately.

3.4.5 Data Download

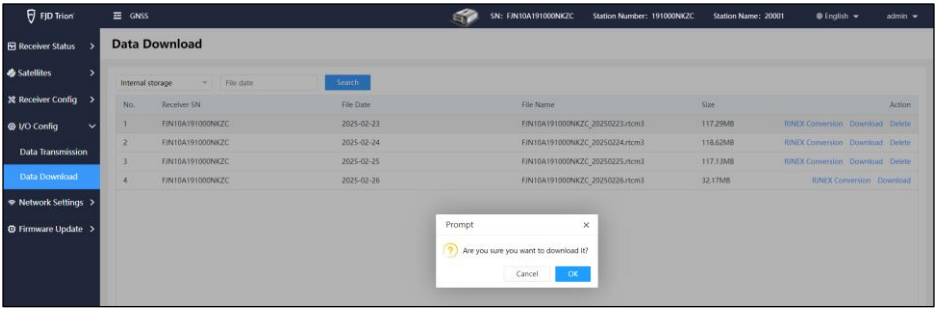
After the serial port (COM1) is set to data record mode, RTCM data stored can be downloaded here.

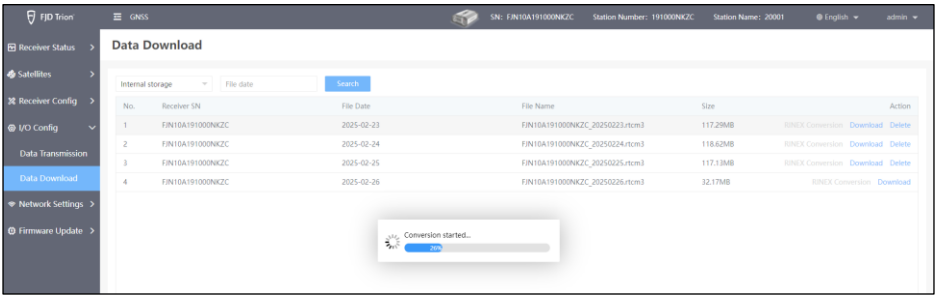


Select Internal storage or External storage, and set the time range. Data stored in the last 30 days can be downloaded.



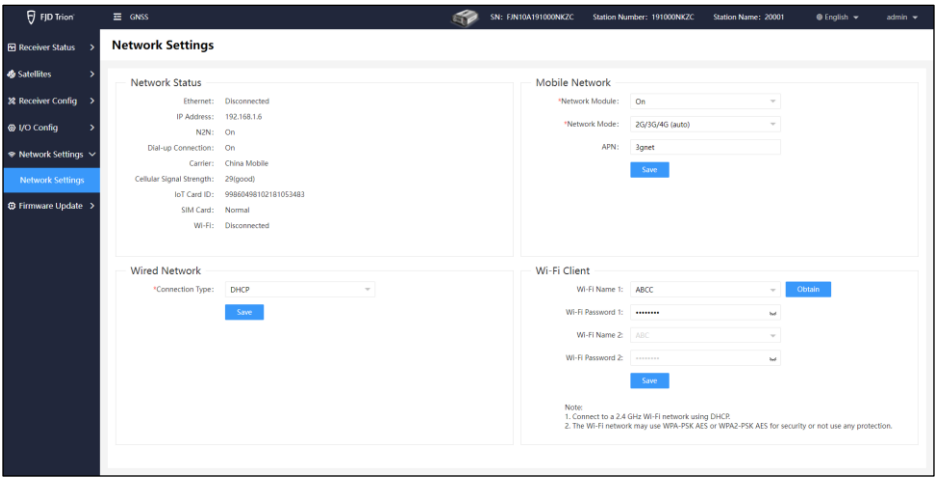
Find the required data file, click Download, and then click OK. The system downloads the file automatically. Click RINEX Conversion, and the system will convert the stored data file into RINEX3.04 format and download the file.





3.5 Network Settings

This module allows for network configuration of the receiver. Ethernet, 4G and Wi-Fi network connection are supported.



3.5.1 Network Status

This feature shows the network connection status of the receiver.

3.5.2 Wired Network

This feature is used when the receiver connects to Ethernet.

Method 1 (DHCP)

- Connection Type: Select DHCP.
- Click Save.

Method 2 (Static IP)

- Connection Type: Select Static IP.
- Enter the IP address, subnet mask, default gateway, DNS1, and DNS2 based on the assigned network.

Refer to section 2.4.2 for details.

3.5.3 Mobile Network

This feature is used when the receiver connects to the 4G network.

- Network Module: Select On.
- Network Mode: Select 2G/3G/4G (auto) by default.
- APN: Enter information provided by the SIM card carrier.

3.5.4 Wi-Fi Client

This feature is used when the receiver connects to the Wi-Fi network.

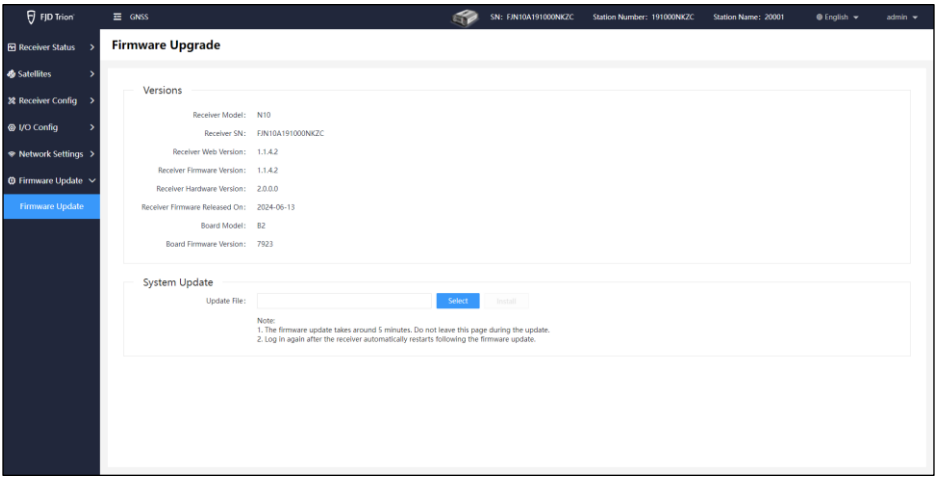
- Wi-Fi Name 1: Click Obtain to select from the dropdown list or manually enter the target Wi-Fi name.
- Wi-Fi Password 1: Enter the corresponding Wi-Fi password.

3.6 Firmware Update

3.6.1 Web Update

This feature allows updating the receiver firmware and board through the Web.

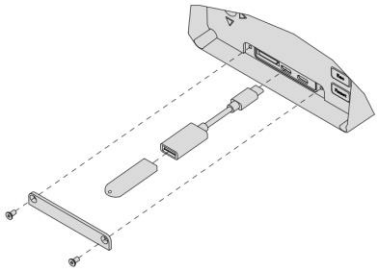
Versions: shows the receiver model, receiver SN, receiver web version, receiver firmware version, receiver hardware version, firmware release date, board model, and board firmware version.



System Update: Select and install an update file to update the web, firmware, and board of the receiver.

3.6.2 USB Flash Drive Update

This feature allows updating the receiver firmware and board through a USB flash drive (Use USB flash drives from mainstream brands, for example, Kingston and SanDisk.). Insert the USB flash drive with the N10 update package into the USB HOST interface (Type-C), and the N10 receiver will automatically recognize the update package and perform the version update. After the updating is completed, the receiver will automatically restart.



Appendix 1 Specifications

Functionality	Positioning	Channels	1,408
		Frequencies	BDS B1I/B2I/B3I/B1C/B2a GPS L1C/A/L2P (Y)/L2C/L5 GLONASS L1/L2 Galileo E1/E5a/E5b QZSS L1/L2/L5
		Accuracy	Single point (RMS) Horizontal: 1.5 m Vertical: 2.5 m
			RTK (RMS) Horizontal: 0.8 cm + 1 ppm Vertical: 1.5 cm + 1 ppm
			Static differential (RMS) Horizontal: 2.5 mm + 1 ppm Vertical: 5.0 mm + 1 ppm
		Update rate	Up to 5 Hz
		Protocols	NMEA-0183, RTCM 2.x/3.x
		GNSS antenna	Survey GNSS antenna or choke ring antenna
	4G network	4G module	Universal
		Coverage	Global (except the Antarctic and Arctic regions)
		SIM card slot	Micro SIM
	Wi-Fi network	Wi-Fi hotspot	For configuring the receiver
		Wi-Fi hotspot properties	Name: FJN10*S/N* Initial password: 123456789 Initial IP address: 192.168.200.1
		Wi-Fi client	For receiver networking (connect to a 2.4 GHz Wi-Fi network using DHCP)
	Ethernet	Ethernet transceiver	Transmission speed: 10/100 Mbps Initial IP address: 192.168.1.6
I/O	USB	USB port	Compliant with USBIF USB2.0 standards. Max.

			transmission speed: 480 Mb/s
		Connector Type	Type-C
		Usage	For connecting to an external storage or updating firmware
	LEMO	LEMO connector	2-pin, applicable power supply: DC 9 V – 36 V, recommended power supply: DC 12 V
	RJ45	Aviation connector	Ethernet port
	COM1	RS232 connector	DB9 connector
	COM2	RS232 connector	7-pin LEMO
	GNSS	GNSS antenna	TNC connector
	4G	4G antenna	SMA connector
	PPS	PPS output	SMA connector
	EVENT	External event input	SMA connector
	CLK	External frequency standard input	SMA connector, reserved
Power supply	Protection	Input voltage	DC 9 V–36 V AC 90 V–260 V
		Over-voltage protection	Threshold: DC 38 V
		Protection against reverse connection	Supported
	Powering method		Lithium battery of 22,000 mAh (under standard conditions) External DC power supply via LEMO connector

	Battery life	>24 h
	Restart	Remote restart supported
Physical and environmental	Power consumption	⩽10 W
	Dimensions	L×W×H: 220.7×152.1×81.7 mm
	Weight	2.08 kg
	IP rating	IP67
	Operating temperature	-40°C to 65°C
	Storage temperature	-40°C to 80°C

Appendix 2 Packing List

No.	Item	Qty.
1	N10 GNSS Reference Receiver	1
2	Power adapter	1
3	4G antenna	1
4	Network cable adapter	1
5	Clip	1
6	Plug (The quantity depends on your country/region.)	2 (for EU)
		1 (for US)
		1 (for China)
7	M3 hexagon socket countersunk head screw	2
8	Hex wrench	1
9	N10 GNSS Reference Receiver Quick Start Guide	1
10	Warranty	1
11	Certification	1

!	Note: This is a general packing list. If there is any inconsistency with the actual shipment, refer to the contract. Check the received items against this list or the contract, and contact your dealer if you have any questions.