



CHCNAV i73+ GNSS

USER GUIDE



Survey & Engineering | March 2022

Make your work more efficient

Table of Content

Table of Content.....	2
Preface	5
Copyright	5
Safety Warnings.....	5
FCC Interference Statement	5
CE Interference Statement	6
1 Introduction.....	7
1.1 Safety Information	7
1.1.1 Warnings and Cautions.....	7
1.2 Regulations and Safety	7
1.2.1 Use and Care.....	8
1.3 Technical Support	8
1.4 Disclaimer	8
1.5 Your Comments	8
2 Getting Started with i73+.....	9
2.1 About the Receiver	9
2.2 Parts of the Receiver.....	9
2.2.1 Front Panel.....	9
2.2.2 Receiver Ports.....	11
2.3 Batteries and Power	12
2.3.1 Built-in batteries	12
2.3.2 Charging the Battery.....	12
2.3.3 Battery Safe	12
2.3.4 External Power Supply.....	13
2.4 Product Basic Supply Accessories.....	14
2.4.1 Rover Kit Basic Supply.....	14
2.4.2 Base Kit Basic Supply	15
2.5 Connecting to an Office Computer	17
2.6 Connecting to a Controller	17
2.6.1 Connecting via Wi-Fi with LandStar 7 Software	17
2.6.2 Connecting via Bluetooth with LandStar 7 Software.....	20
2.7 Downloading Logged Data.....	22
2.7.1 FTP Download.....	22
2.7.2 Web Server Download.....	24

2.7.3 USB Download	24
3 Equipment Setup and Operation	26
3.1 Post-processing Base Station Setup	26
3.2 Real-Time Rover Station Setup	28
3.3 Working with the Tilt Compensation	29
3.3.1 Operation Steps	29
3.3.2 Notes of using tilt measurement	31
4 Configuring Through a Web Browser	33
5.1 Status Menu	34
5.1.1 Position Submenu	35
5.1.2 Activity Submenu	35
5.1.3 Google Map Submenu	35
5.2 Satellites Menu	36
5.2.1 Tracking Table Submenu	36
5.2.2 Tracking Info. Table Submenu	37
5.2.3 Tracking Skyplot Submenu	37
5.2.4 Satellite Activation Submenu	38
5.3 Receiver Configuration Menu	39
5.3.1 Description	39
5.3.2 Antenna Configuration Submenu	39
5.3.4 Receiver Reset Submenu	41
5.3.5 Languages Submenu	41
5.3.6 User Management Submenu	42
5.3.7 USB Function Switch	42
5.3.8 HCPPP Settings	49
5.4 Data Recording Menu	49
5.4.1 Log Settings Submenu	49
5.4.2 FTP Push Settings Submenu	52
5.4.3 FTP Push Log Submenu	53
5.4.4 Data Download Submenu	53
5.5 IO Settings Menu	55
5.5.1 IO Settings Submenu	55
5.6 Module Setting Menu	63
5.6.1 Description Submenu	63
5.6.2 WiFi Submenu	63
5.6.3 Bluetooth Settings Submenu	64
5.6.4 Radio Settings Submenu	64
5.7 Firmware Menu	65

5.7.1 Firmware Info Submenu	66
5.7.2 Hardware Version Submenu	66
5.7.3 Config File Submenu	66
5.7.4 System Log Download Submenu	66
5.7.5 User Log Submenu	67
5.7.6 Firmware Update Submenu	67
5.7.7 GNSS Board Upgrade Submenu	68
5.7.8 GNSS Registration Submenu	69

Preface

Copyright

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Trademarks

All product and brand names mentioned in this publication are trademarks of their respective holders.

Safety Warnings

The Global Positioning System (GPS) is operated by the U.S. Government, which is solely responsible for the accuracy and maintenance of the GPS network. Accuracy can also be affected by poor satellite geometry and obstructions, like buildings and heavy canopy.

FCC Interference Statement

This equipment has been designed to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules in the Portable Mode. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

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.

CE Interference Statement

Declaration of Conformity: Hereby, Shanghai Huace Navigation Technology Ltd. declares that this i73+ is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. A copy of the Declaration of conformity can be found at Shanghai Huace Navigation Technology Ltd.



1 Introduction

The i73+ GNSS receiver removes barriers to portability without sacrificing performance. Featuring full GNSS technology, it offers best-in-class GNSS signal tracking even in a harsh environment, enabling GNSS surveying beyond usual constraints. The i73+ GNSS incorporates the latest innovations such as an inertial module (IMU) providing automatic pole-tilt compensation in a very compact design.

1.1 Safety Information

1.1.1 Warnings and Cautions

An absence of specific alerts does not mean that there are no safety risks involved.

A Warning or Caution information is intended to minimize the risk of personal injury and/or damage to the equipment.



WARNING - A Warning alerts you to a potential misused or wrong setting of the equipment.



CAUTION - A Caution alerts you to a possible risk of serious injury to your person and/or damage to the equipment.

1.2 Regulations and Safety

The receivers contain a built-in wireless modem for signal communication through Bluetooth® wireless technology or through external communication datalink. Regulations regarding the use of the wireless modem vary greatly from country to country. In some countries, the unit can be used without obtaining an end-user license. However, in some countries, the administrative permissions are required. For license information, consult your local dealer. Bluetooth® operates in license-free bands.

Before operating a i73+ GNSS receiver, determine if authorization or a license to operate the unit is required in your country. It is the responsibility of the end-user to obtain an operator's permit or license for the receiver for the location or country of use.

1.2.1 Use and Care

This receiver is designed to withstand the rough environment that typically occurs in the field. However, the receiver is high-precision electronic equipment and should be treated with reasonable care.



CAUTION - Operating or storing the receiver outside the specified temperature range will cause irreversible damage.

1.3 Technical Support

If you have a problem and cannot find the information you need in this manual or CHCNAV website (www.chcnav.com), contact your local CHCNAV dealer from which you purchased the receiver(s).

If you need to contact CHCNAV technical support, please contact us by email (support@chcnav.com) or Skype (chc_support).

1.4 Disclaimer

Before using the receiver, please make sure that you have read and understood this User Guide, as well as the safety information. CHCNAV holds no responsibility for the wrong operation by users and for the losses incurred by the wrong understanding about this User Guide. However, CHCNAV reserves the rights to update and optimize the contents in this guide regularly. Please contact your local CHCNAV dealer for new information.

1.5 Your Comments

Your feedback about this user guide will help us to improve it in future revision. Please email your comments to support@chcnav.com.

2 Getting Started with i73+

2.1 About the Receiver

The new CHCNAV i73+ GNSS receiver offers integrated IMU-RTK technology to provide a robust and accurate GNSS positioning in any circumstances. Unlike the standard MEMS based GNSS receivers, the i73+ GNSS IMU-RTK combines state-of-the-art GNSS RTK engine, calibration-free professional IMU sensor and advanced GNSS tracking capabilities. Survey projects are achieved with high productivity and reliability pushing the boundaries of conventional GNSS RTK survey.

The receiver can be used as the part of an RTK GNSS system with CHCNAV LandStar7 software. Moreover, user can download the GNSS data that recorded in the internal memory of receiver to a computer.

To configure the receiver for performing a wide variety of functions, you can use the web interface by connecting the receiver with PC or smartphone through Wi-Fi.

2.2 Parts of the Receiver

The operating controls are all located on the front panel. Serial ports and connectors are located on the bottom of the unit.

2.2.1 Front Panel

The following figure shows a front view of the receiver.



The front panel contains four indicator LEDs and two buttons.





Name	Description
Correction LED (Green)	<ul style="list-style-type: none"> Indicates whether the receiver is transmitting/receiving differential data. The green LED flashes once per second when <ul style="list-style-type: none"> As a Base station: successfully transmitting differential data. As a Rover station: successfully receiving differential data from Base station.
Satellite LED (Blue)	<ul style="list-style-type: none"> Shows the number of satellites that the receiver has tracked. When the receiver is searching satellites, the blue LED flashes once every 5 seconds. When the receiver has tracked N satellites, the blue LED will flash N times every 5 seconds.
Function button (Yellow)	<ul style="list-style-type: none"> Press and hold this button for 10 seconds to turn on or turn off the static mode. Flash means static is on.
Power button (Red)	<ul style="list-style-type: none"> Works as a Power button: Press and hold this button for 3 seconds to turn on or turn off the receiver. Hold Fn button and press this button for 5 times continuously to reset the mainboard.

2.2.2 Receiver Ports

The receiver ports contain one TNC radio antenna connector, one communication and power ports, one 5/8-11 threaded insert, and one nameplate.



Port	Name	Description
	USB Type-C port	<ul style="list-style-type: none"> This port is a USB Type-C connector that supports USB communications. Users can use USB Type-C Cable supplied with the system to download the logged data to a computer.
	Radio antenna connector	<ul style="list-style-type: none"> Connect a radio antenna to internal radio of the receiver. And this connector is not used if you are using an external radio.

2.3 Batteries and Power

2.3.1 Built-in batteries

The receiver has two built-in 6800 mAh rechargeable Lithium-ion batteries.

2.3.2 Charging the Battery

The rechargeable Lithium-ion battery is supplied partially charged. Charge the battery completely before using it for the first time. Charge via USB Type-C port.



WARNING – Charge and use the rechargeable Lithium-ion battery only in strict accordance with the instructions. Charging or using the battery in unauthorized equipment can cause an explosion or fire and can result in personal injury and/or equipment damage.

To prevent injury or damage:

- Do not charge or use the battery if it appears to be damaged or leaking.
- Charge the Lithium-ion battery only in a CHCNAV product that is specified to charge it. Be sure to follow all instructions that are provided with the battery charger.
- Discontinue charging a battery that gives off extreme heat or a burning odor.
- Use the battery only in CHCNAV equipment that is specified to use it.
- Use the battery only for its intended use and according to the instructions in the product documentation.

2.3.3 Battery Safe



WARNING – Do not damage the rechargeable Lithium-ion battery. A damaged battery can cause an explosion or fire and can result in personal injury and/or property damage.

To prevent injury or damage:

- Do not expose the battery to fire, high temperature, or direct sunlight.
- Do not immerse the battery in water.
- Do not drop or puncture the battery.

2.3.4 External Power Supply

Provide the external power to the receiver by the USB Type-C Cable + Power Adapter.

The Power Adapter is connecting with AC power of 100-240V, the output port of the Power Adapter connects with the USB Type-C Cable.



2.4 Product Basic Supply Accessories

2.4.1 Rover Kit Basic Supply

Item	Picture
I73+ GNSS Receiver	
UHF Bar Antenna (410-470 MHz)	
USB Type-C Cable	
2M Range Pole w/bag	
Auxiliary H.I. Tool	
Power Adapter.	
Transport Hard Case	

2.4.2 Base Kit Basic Supply

Item	Picture
i73+ GNSS Receiver	
UHF Bar Antenna (410-470 MHz)	
USB Type-C Cable	
Tribrach adaptor	
Extension Pole(30cm)	
Auxiliary H.I. Tool	
H.I. Tape	
Tribrach	
Power Adapter.	
Datalink Power Cable (5-pin)	

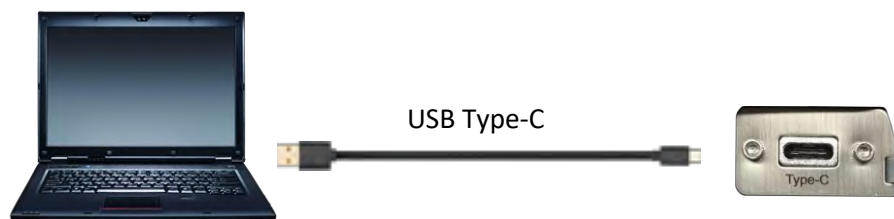
Transport Hard Case



2.5 Connecting to an Office Computer

The receiver can be connected to an office computer via a HCE320 USB Type-C. Before you connect to the office computer, ensure that the receiver is powered on.

The following figure shows how to connect to the computer for serial data transfer or settings:



2.6 Connecting to a Controller

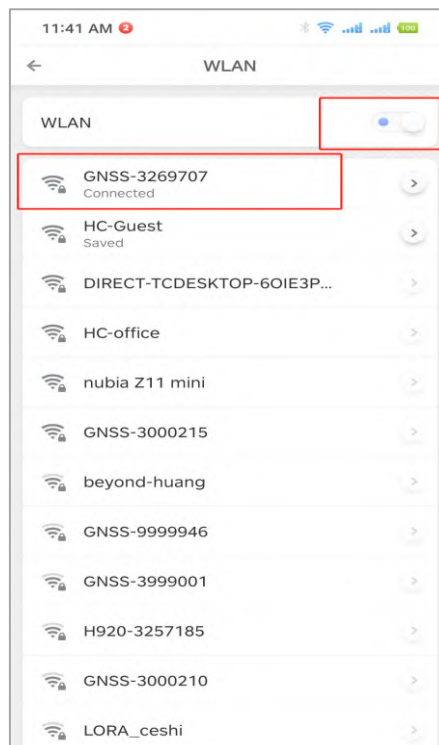
2.6.1 Connecting via Wi-Fi with LandStar 7 Software

Turn on the controller → run LandStar 7 → go to **Config** main menu → tap **Connect**.

In the *Connect* screen, select **CHC** for the *Manufacture* field, **i73+** for *Device Type* field, **WIFI** for *Connection Type* field.

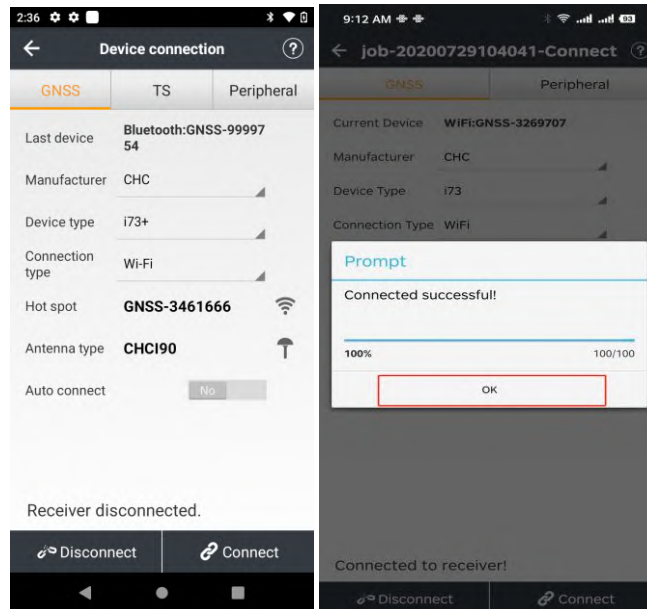


Tap the Wireless Lan icon on the right side to select the hot spot → Switch on the WiFi module by the top switch → select the target device in the list.



Tap **Connect** to link to the hot spot. If the first-time connection to this hot spot, user do not need to type in password

Tap the **Connect** button to build the connection.



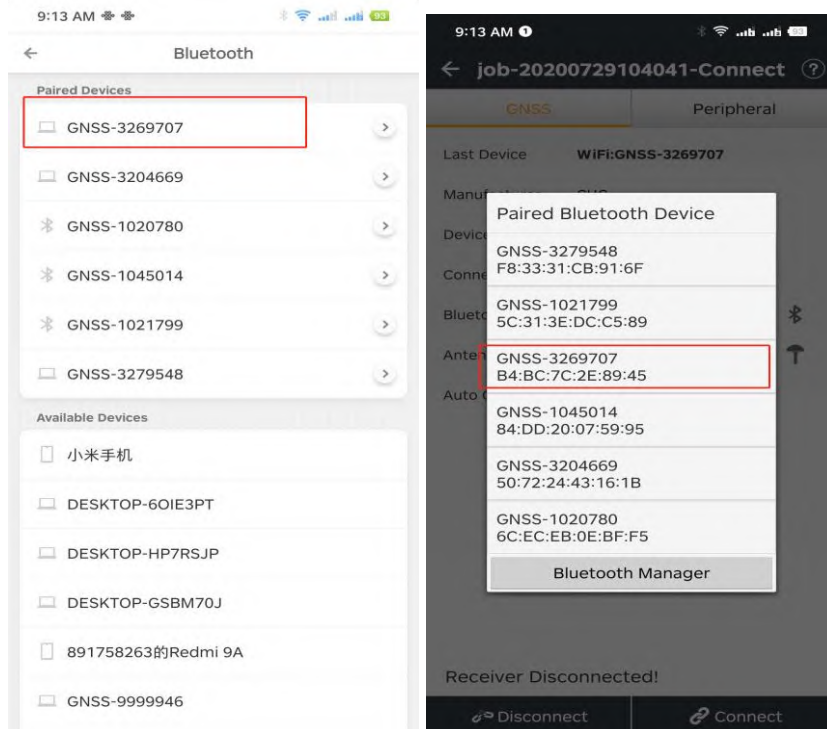
2.6.2 Connecting via Bluetooth with LandStar 7 Software

Turn on the controller → run LandStar 7 → go to **Config** main menu → tap **Connect**.

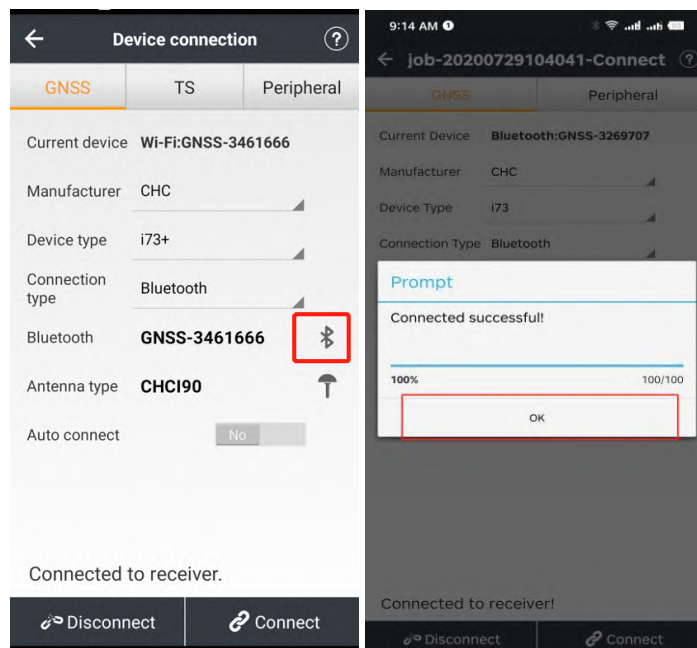
In the *Connect* screen, select **CHC** for the *Manufacture* field, **i73+** for *Device Type* field, **Bluetooth** for *Connection Type* field.



Tap the **Bluetooth Manager** and turn on the **Bluetooth** function to search Bluetooth device around → select the target device in the list → Tap back button → select the target device in the Bluetooth manager list.



Tap the **Connect** button to build the connection.



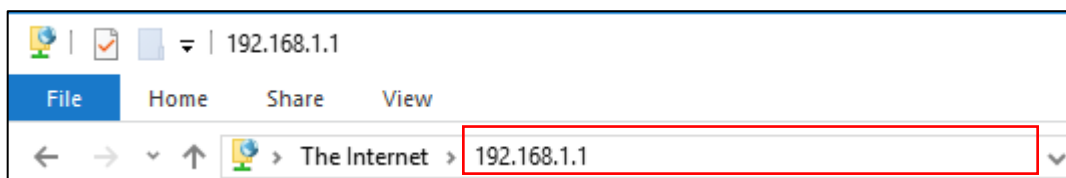
2.7 Downloading Logged Data

Data logging involves the collection of GNSS measurement data over a period at a static point or points, and subsequent post-processing of the information to accurately compute baseline information. Data logging using receivers requires access to suitable GNSS post-processing software such as the CHC Geomatics Office (CGO) Software.

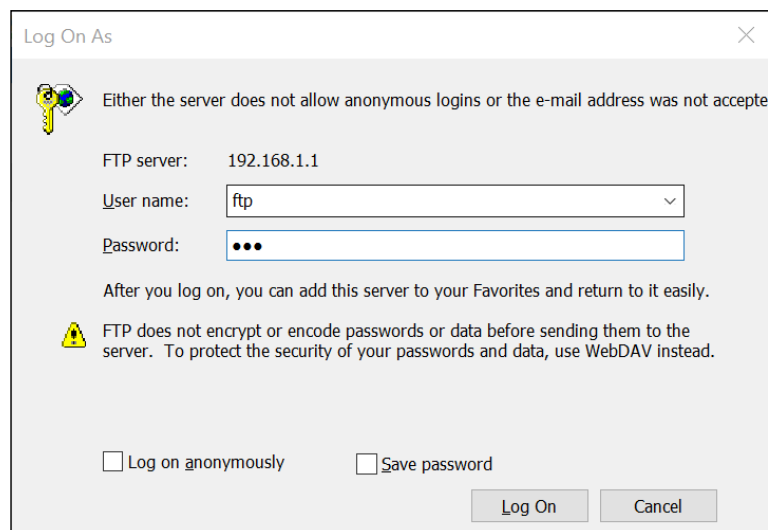
2.7.1 FTP Download

The procedures of downloading logged data through FTP are as follows:

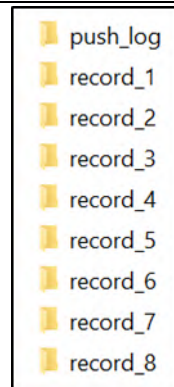
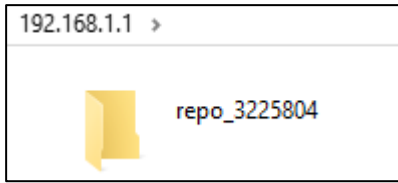
- (1) Switch on the receiver, search its Wi-Fi in the computer and connect.
- (2) After the successful connection, open the file manager in the computer and input “ftp:\\192.168.1.1” in the address box.



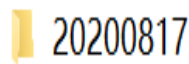
- (3) Input user name and password, the default user name and password are “ftp”.



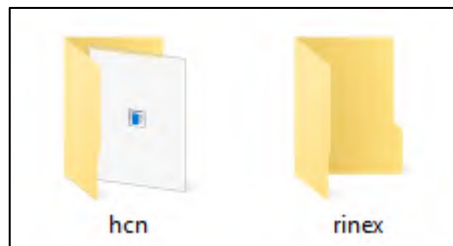
- (4) Double click the folder “repo_receiver SN” (take 3225804 as example), you will see 9 folders. The “push_log” folder is used to save the log files, and the other 8 folders represent different logging sessions and are used for store static data.



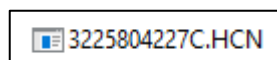
(5) Double click the folder that you have configured to store the static data, you will see the folder(s) created by the i73+ system automatically and named by the date which is decide by GPS time when you start to log data.



(6) Select the destination folder and double click it, two folders named as different data format (hcn and rinex) will be displayed.



(7) Select the data format that you configured to save the static data, you will find the static raw data.



Notes: For hcn files, the name of the file is represented as XXXXXDDDNN, where XXXXXX is the SN of the receiver, DDD is day of year, and NN is the recording session.



WARNING – The static data will be saved in the first logging session, the “record_1” folder, by default. Old files will be deleted if the storage space is full. If you configure not to auto delete old files when the memory is low, the receiver will stop data logging.

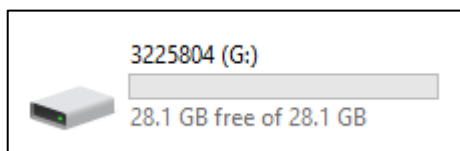
2.7.2 Web Server Download

The procedures of downloading logged data through web server refer to [5.4.4 Data Download Submenu](#).

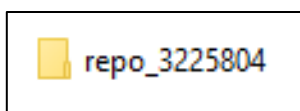
2.7.3 USB Download

The procedures of downloading logged data in the receiver are as follows:

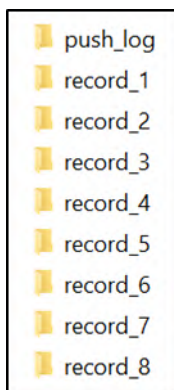
(1) Switch on the receiver and connect it with a computer by HCE320 Type-C. After the successful connection, a removable disk named as the Serial Number (SN) of the receiver will appear on the computer.



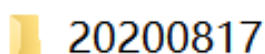
(2) Double click the removable disk and you will see the folder named as “repo”.



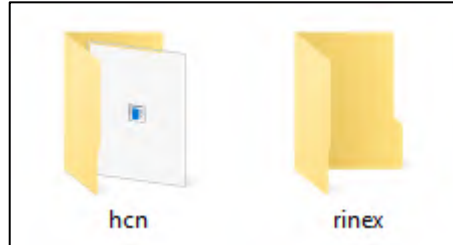
(3) Double click this folder, you will see 9 folders. The “push_log” folder is used to save the log files, and the other 8 folders represent different logging session and are used for store static data.



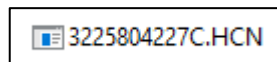
(4) Double click the folder that you have configured to store the static data, you will see the folder(s) created by the i73+ system automatically and named by the date which is decide by GPS time when you start to log data.



(5) Select the destination folder and double click it, and then two folders named as different data format (hcn and rinex) will be displayed.



(6) Select the data format that you have configured to save the static data, you will find the static raw data.



Tip – For hcn files, the name of the file is represented as XXXXXDDNN, where XXXXX is the SN of the receiver, DDD is day of year, and NN is the recording session.



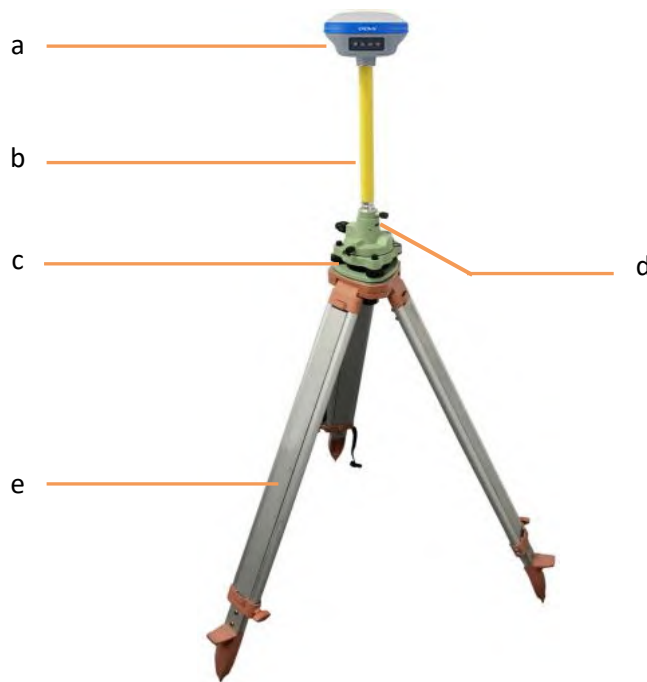
WARNING – The static data will be saved in the first logging session, the “record_1” folder, by default. Old files will be deleted if the storage space is full. If you configure not to auto delete old files when the memory is low, the receiver will stop data logging.

3 Equipment Setup and Operation

3.1 Post-processing Base Station Setup

For good performance, the following base station setup guidelines are recommended:

Components:



No.	Name
a	i73+ GNSS receiver
b	Extension pole (30 cm)
c	Tribrach adaptor
d	Tribrach w/ Opti
e	Aluminum tripod

Steps:

- (1) Put tripod in the target position, center and level it roughly.
- (2) Place and lock the tribrach in the tripod.
- (3) Screw the receiver onto the tribrach.
- (4) Center and level the receiver more precisely.
- (5) Connect the receiver to external battery by using USB Type-C cable if necessary.
- (6) Turn on the receiver by pressing the power button for 3 s.
- (7) Measure the antenna height by using H.I. tape and auxiliary H.I. tool.
- (8) Press the function button to select Data to start recording static raw.

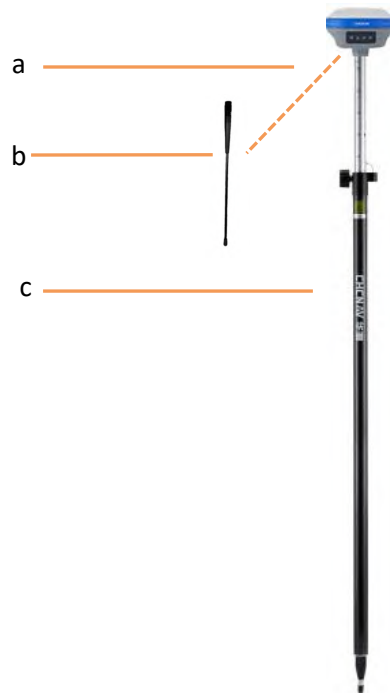
If work with a data controller:

- (9) Switch on the data controller and connect it to the receiver.
- (10) Use software to configure the receiver as static mode.

3.2 Real-Time Rover Station Setup

For good performance, the following rover station setup guidelines are recommended:

Components




No.	Name
a	i73+ GNSS receiver
b	UHF whip antenna
c	2M range pole w/bag

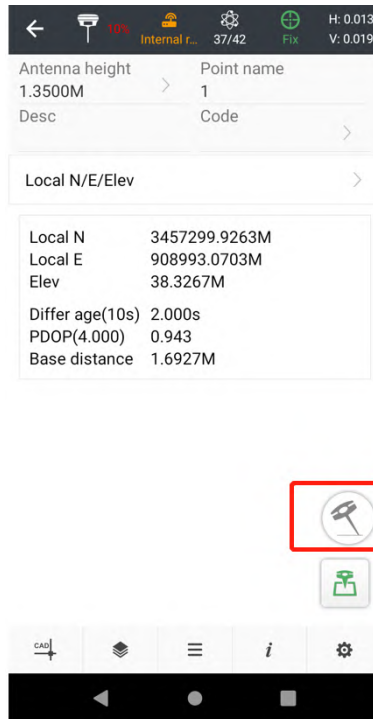
Steps:

- (1) Connect the UHF whip antenna to the receiver.
- (2) Screw the receiver onto the pole.
- (3) Turn on the receiver by pressing the power button for 3 s.
- (4) Switch on the data controller and connect it to the receiver.
- (5) Use software to configure the receiver as rover mode.
- (6) Center and level the receiver more precisely.
- (7) Use software to start survey.

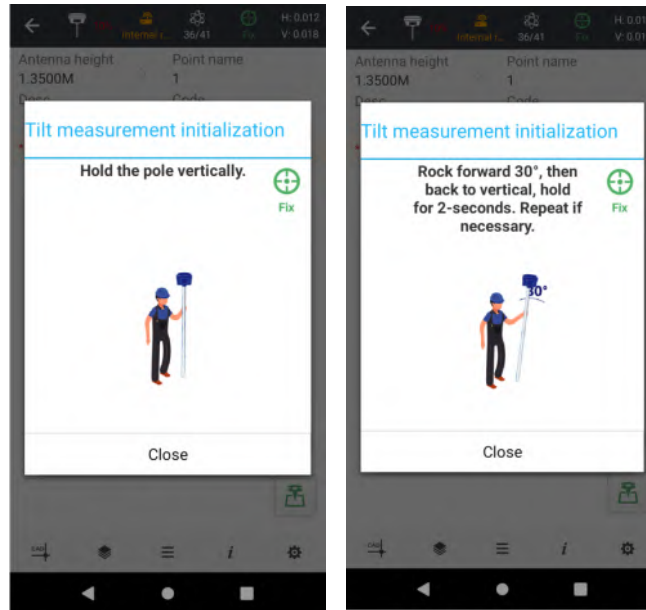
3.3 Working with the Tilt Compensation


3.3.1 Operation Steps

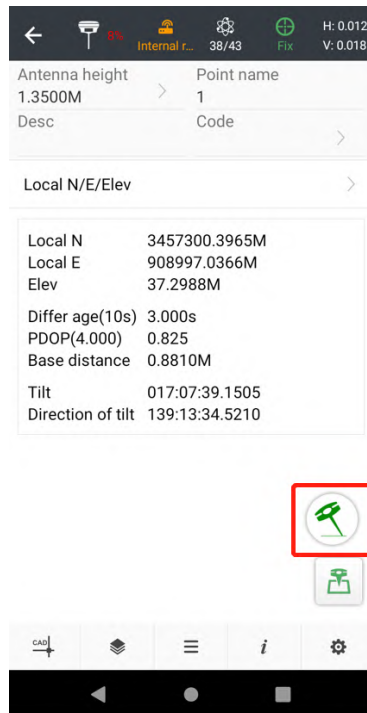
(1) Open Landstar7-> Tap PT Survey-> Tap  to activate tilt measurement.




(2) Shake around according to the procedures in the interface to do initialization.




(3) This icon  will appear when the initialization is successful.



(4) Enter the Name and Antenna, then tap  point will be collected and store to Points automatically.

(5) When this icon  appears, the text will show “Tilt is not available, please measure in alignment” at the bottom of interface.



(6) Tap  to close tilt compensation.

3.3.2 Notes of using tilt measurement

1. At the beginning of initialization, the pole height of the instrument should be the same as that antenna height in the software.
2. In the process of tilt measurement, if the controller shows that “Tilt is not available, please measure in alignment” (red), please shake RTK slightly from left to right or back to front until the reminder disappears.
3. The controller will prompt “Tilt is not available, please measure in alignment” when the receiver is stationary over 30 seconds or the pole hit the ground toughly.
4. The pole cannot be shaken when point is collected.
5. The receiver cannot be moved in a circle in one direction for more than 360 degrees. if the receiver has been rotated 360 degrees, it must be rotated in the opposite direction to recover again.

6. Initialization is required:

- when the RTK is turned on every time;
- when IMU module is turned on every time;
- when receiver drops at working;
- when the pole is tilted more than 65 degree;
- when the receiver is stationary more than 10 minutes;
- when the RTK rotates too fast on the matching pole (2 rounds per second);
- when the pole hit the ground toughly.

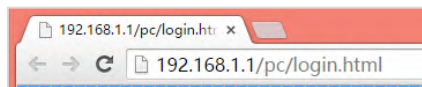
4 Configuring Through a Web Browser

Supported browsers:

- Google Chrome
- Microsoft Internet Explorer[®] version 10, or higher

To connect to the receiver through a web browser:

1. Turn on the Wi-Fi of the receiver.
2. Search the wireless network named as GNSS-XXXXXXX (the SN of your receiver) on your computer, and then establish the connection.
3. After the successful connection between your computer and the receiver, enter the IP address (192.168.1.1) of the receiver into the address bar of the web browser on your computer:



4. The web browser prompts you to enter a login account and password:

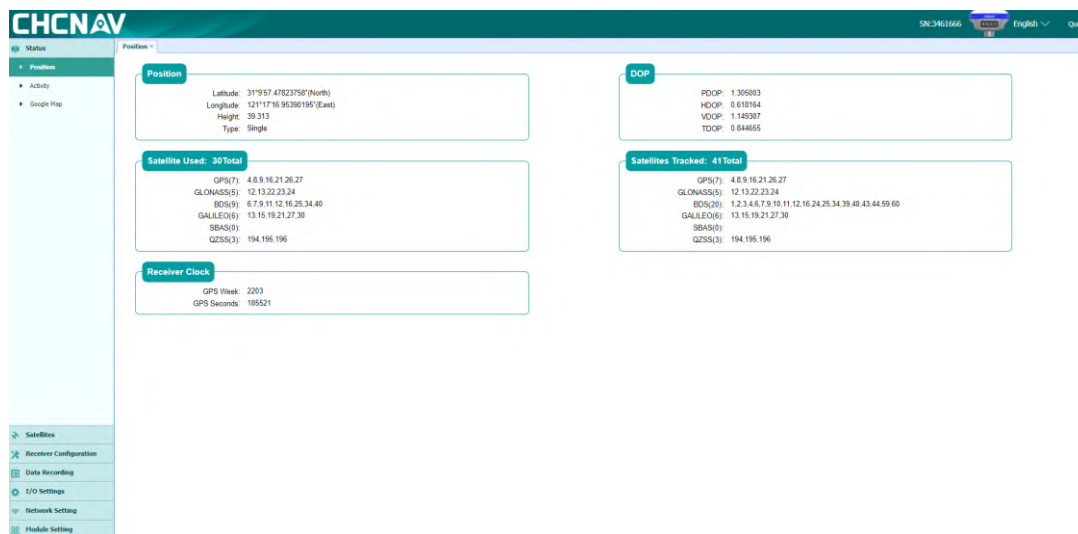


The default login account for the receiver is:

- Login Account: admin
- Password: password

Note – Tick **remember me** option, and then the browser will remember the Login Account and Password you entered.

5. Once you log in, the web page appears as follows:

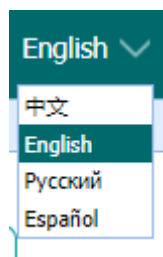


This web page shows the configuration menus on the left of the browser window, and the setting on the right. Each configuration menu contains the related Submenus to configure the receiver and monitor receiver performance.

This chapter describes each configuration menu.

To view the web page in another language, select the corresponding language name from the dropdown list on the upper right corner of the web page.

Currently, four languages are available:

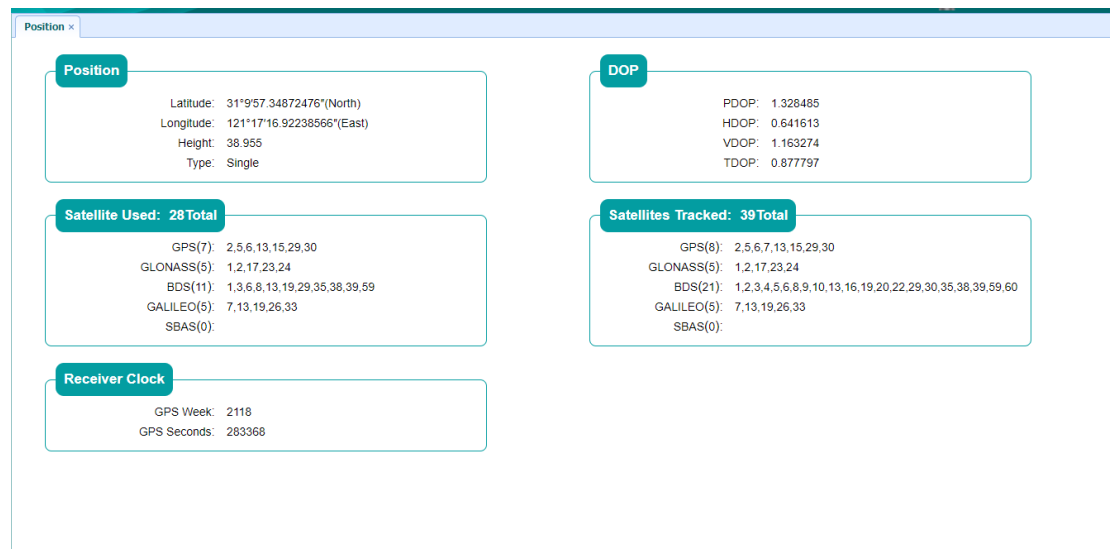


5.1 Status Menu

This menu provides a quick link to review the receiver's position information, satellites tracked, runtime, current data log status, current outputs, available memory, and more.

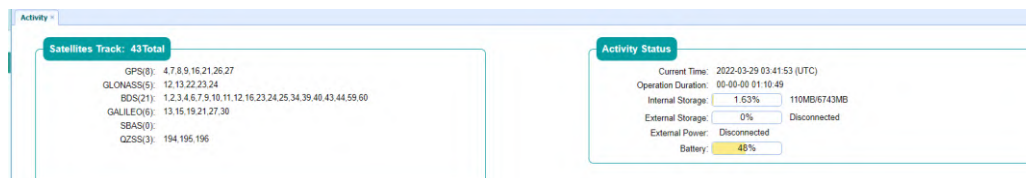
5.1.1 Position Submenu

This page shows the relevant position information about the receiver's position solution which including the position, DOP values, satellites used and tracked, and the receiver clock information.



5.1.2 Activity Submenu

Lists several important items to help you understand how the receiver is being used and its current operating condition. Items include the identities of currently tracked satellites, internal and external storage usage rate, how long the receiver has been operational, state of the internal battery, power source state. With this information, it is easy to tell exactly what functions the receiver is performing:



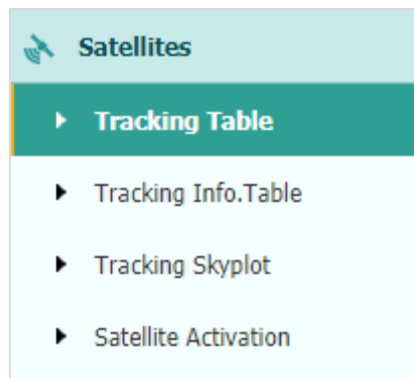
5.1.3 Google Map Submenu

Tap this submenu to show the location of the receiver on Google map.



5.2 Satellites Menu

Use the Satellites menu to view satellite tracking details and enable/disable GPS, GLONASS, BDS and Galileo constellations. These menus include tabular and graphical displays to provide all required information on satellite tracking status.



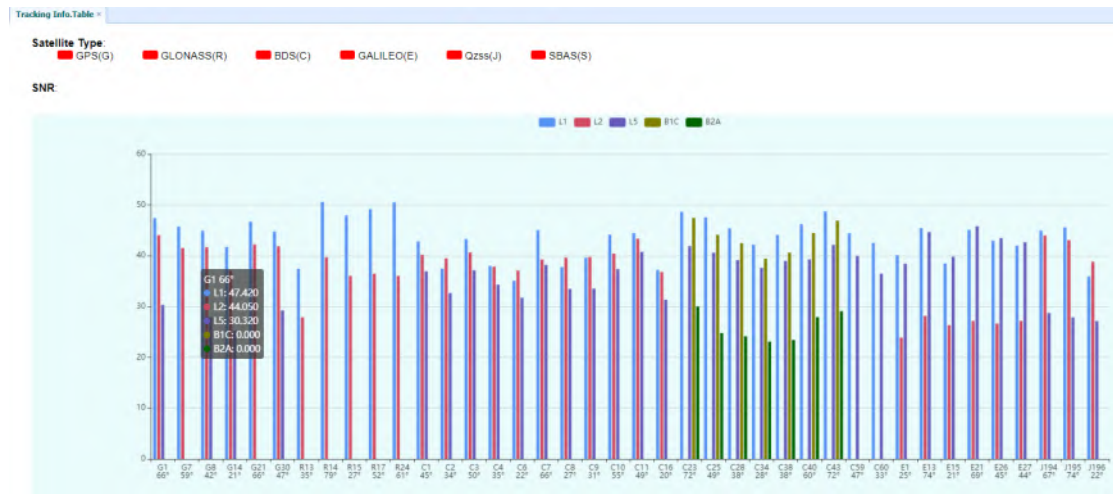
5.2.1 Tracking Table Submenu

Provides the status of satellites tracked in general, such as the satellite ID, satellite type, attitude angle, azimuth angle, L1 SNR, L2 SNR, L5 SNR and enable/disable status of each one.

SV	Type	Elevation Angle	Azimuth Angle	L1 SNR	L2 SNR	L5 SNR	B1C SNR	B2A SNR	Enabled
1	GPS	66	175	47.620	45.340	31.550	0.000	0.000	Yes
7	GPS	59	248	45.800	43.270	0.000	0.000	0.000	Yes
8	GPS	43	40	44.910	43.230	28.540	0.000	0.000	Yes
14	GPS	21	310	42.110	39.350	27.310	0.000	0.000	Yes
21	GPS	66	62	46.730	43.360	0.000	0.000	0.000	Yes
30	GPS	47	289	44.380	44.070	29.210	0.000	0.000	Yes
13	GLONASS	35	138	36.660	27.270	0.000	0.000	0.000	Yes
14	GLONASS	79	12	50.560	37.180	0.000	0.000	0.000	Yes
15	GLONASS	27	330	48.880	29.530	0.000	0.000	0.000	Yes
17	GLONASS	51	243	49.440	26.720	0.000	0.000	0.000	Yes
24	GLONASS	61	6	50.860	30.130	0.000	0.000	0.000	Yes
1	BDS	45	140	43.830	40.060	35.010	0.000	0.000	Yes
2	BDS	34	234	38.570	39.630	30.630	0.000	0.000	No
3	BDS	50	199	44.310	40.600	35.210	0.000	0.000	Yes
4	BDS	35	122	39.100	38.050	33.110	0.000	0.000	No
6	BDS	22	205	36.690	36.470	30.440	0.000	0.000	No
7	BDS	66	342	46.030	39.830	36.290	0.000	0.000	Yes
8	BDS	27	178	39.230	39.400	31.820	0.000	0.000	No

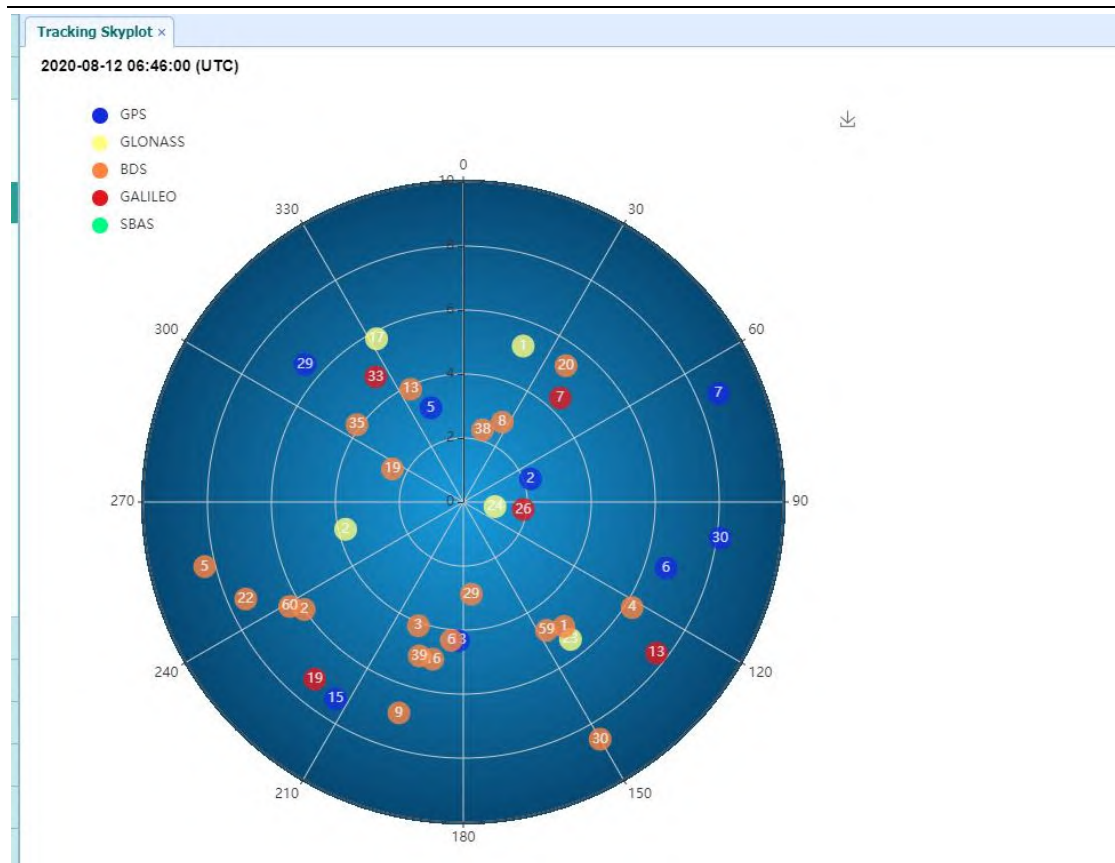
5.2.2 Tracking Info. Table Submenu

The following figure is an example of satellite track diagram page. Users can determine the satellite types and the corresponding SNR of L-band carriers to be displayed in any combination.



5.2.3 Tracking Skyplot Submenu

The following figure is an example of Skyplot page.



5.2.4 Satellite Activation Submenu

Use this menu to enable or disable satellites.

Satellite Activation

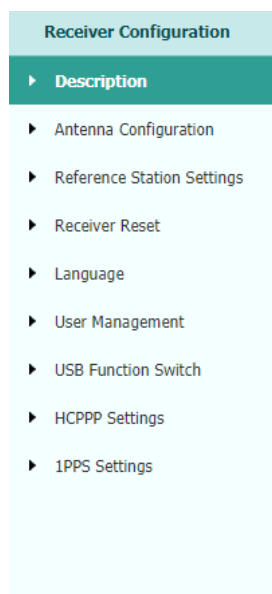
GPS GLONASS BDS GALILEO QZSS SBAS

Enable All Disable All

Satellite Id	Enable	Satellite Id	Enable
1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	4	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	6	<input checked="" type="checkbox"/>
7	<input checked="" type="checkbox"/>	8	<input checked="" type="checkbox"/>
9	<input checked="" type="checkbox"/>	10	<input checked="" type="checkbox"/>
11	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>
13	<input checked="" type="checkbox"/>	14	<input checked="" type="checkbox"/>
15	<input checked="" type="checkbox"/>	16	<input checked="" type="checkbox"/>
17	<input checked="" type="checkbox"/>	18	<input checked="" type="checkbox"/>
19	<input checked="" type="checkbox"/>	20	<input checked="" type="checkbox"/>
21	<input checked="" type="checkbox"/>	22	<input checked="" type="checkbox"/>
23	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>
25	<input checked="" type="checkbox"/>	26	<input checked="" type="checkbox"/>
27	<input checked="" type="checkbox"/>	28	<input checked="" type="checkbox"/>
29	<input checked="" type="checkbox"/>	30	<input checked="" type="checkbox"/>
31	<input checked="" type="checkbox"/>	32	<input checked="" type="checkbox"/>

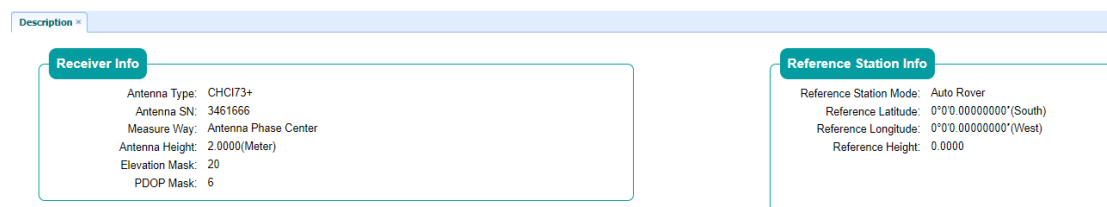
5.3 Receiver Configuration Menu

Use this menu to configure settings such as the antenna type and height, elevation mask and PDOP setting, the reference station coordinates, receiver resetting and web interface language:



5.3.1 Description

This submenu shows the receiver information and reference station information, including antenna related information, elevation mask angle, reference station work mode and position, etc.



5.3.2 Antenna Configuration Submenu

Use this screen to configure all the items related to the GNSS antenna. You must enter the correct values for all antenna-related fields, because the choices you make affect the

accuracy for logged data and broadcast correction data significantly:

Antenna Configuration

Measure Way:	<input type="text" value="Antenna Phase Center"/>	▼
Antenna manufacturer:	<input type="text" value="CHCNav"/>	▼
Antenna Type:	<input type="text" value="CHCI73+"/>	▼
Antenna SN:	<input type="text" value="3461666"/>	
Antenna Height:	<input type="text" value="2.0000"/>	(Meter)
Elevation Mask:	<input type="text" value="20"/>	
PDOP Mask:	<input type="text" value="6"/>	

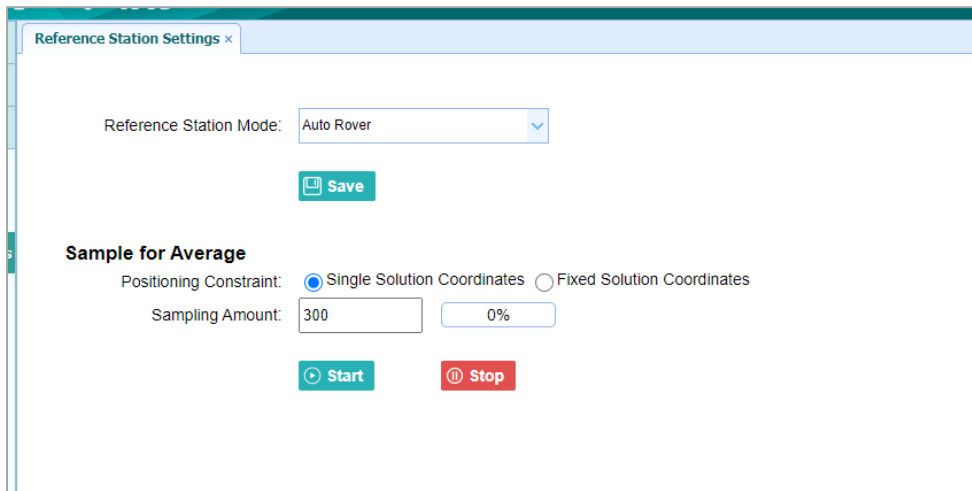
5.3.3 Reference Station Settings Submenu

Use this screen to configure settings such as the station coordinates and the broadcast station identifiers. You must enter accurate information in these fields, as this data affects the accuracy of logged data files and broadcast correction data significantly:

For **Reference Station Mode**:

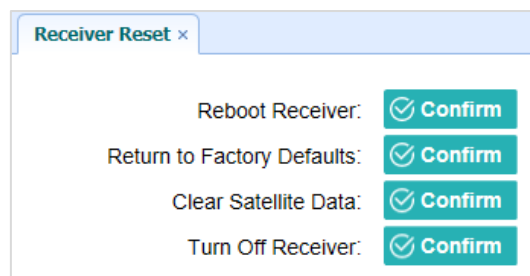
There are three modes available:

- a) **Auto Rover:** The receiver will serve as a rover after this mode is enabled, and then receive correction data through the working mode set last time.



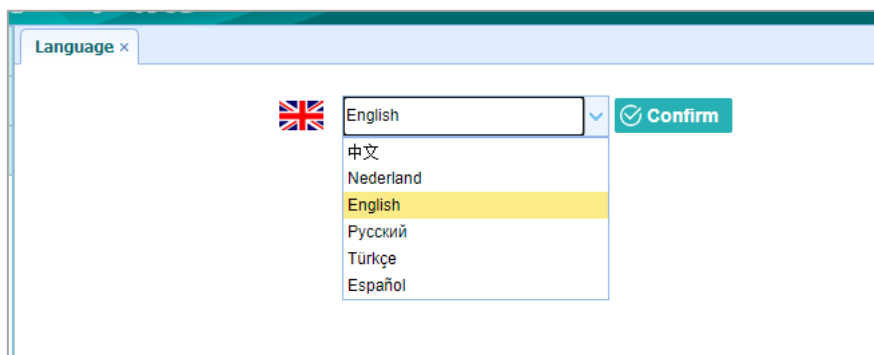
5.3.4 Receiver Reset Submenu

Use this screen to completely or partially reset the receiver:

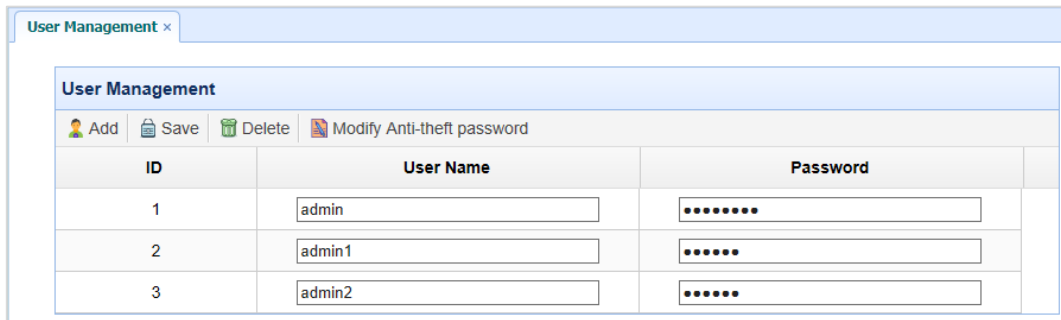


5.3.5 Languages Submenu

Use this screen to select the web interface language:



5.3.6 User Management Submenu

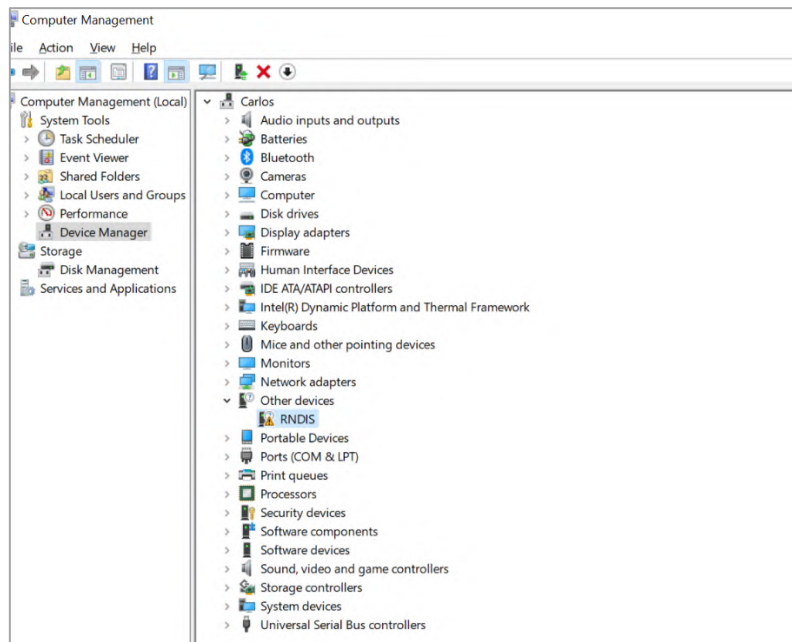


5.3.7 USB Function Switch

Use this screen to set i73+ work as APIS base.



1. Connect i73+ to PC by USB cable, it will shown in device manager as unknown device:
RNDIS



2. Install the driver for i73+ RNDIS
 - a) Right click RNDIS, and select update driver, and choose Browse my computer for driver software.

← Update Drivers - RNDIS

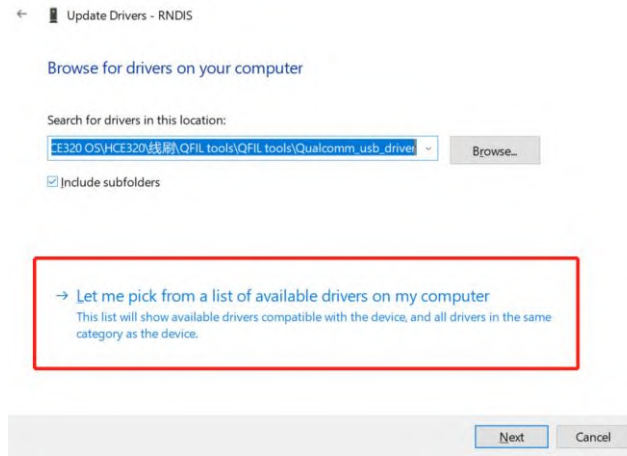
How do you want to search for drivers?

→ Search automatically for updated driver software
 Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.

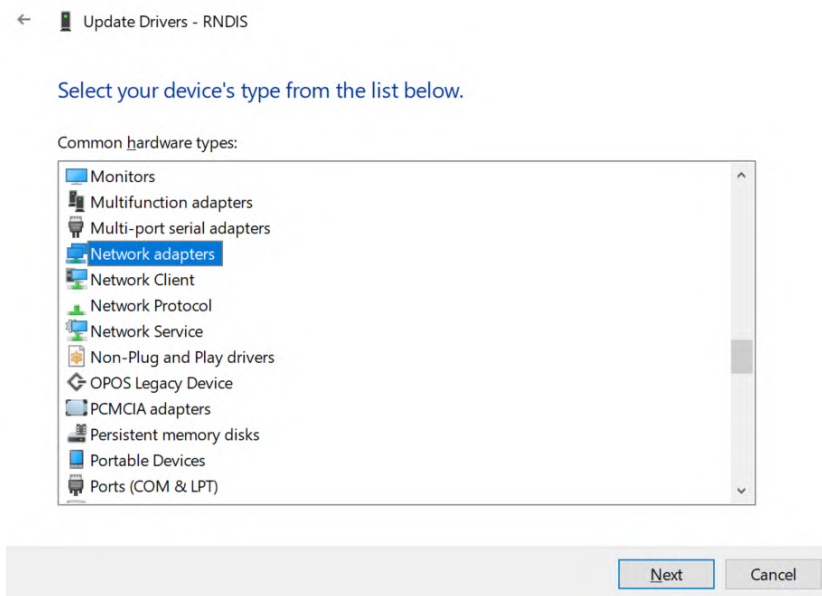
→ Browse my computer for driver software
 Locate and install driver software manually.

Cancel

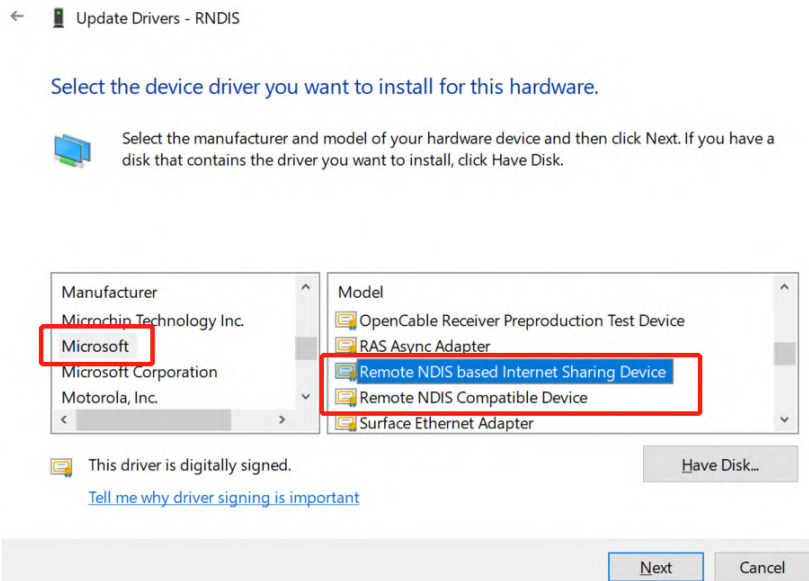
b) Select Let me pick from a list of available drivers on my computer, and click next



c) Then there will appear a hardware type list. In the list, select Network adapters.

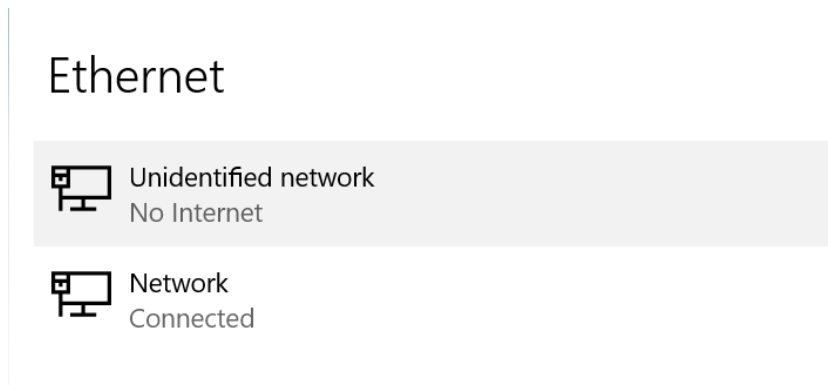


d) Then find Microsoft in the Manufacturer list, and select Remote NDIS based Internet Sharing Device in the model list.

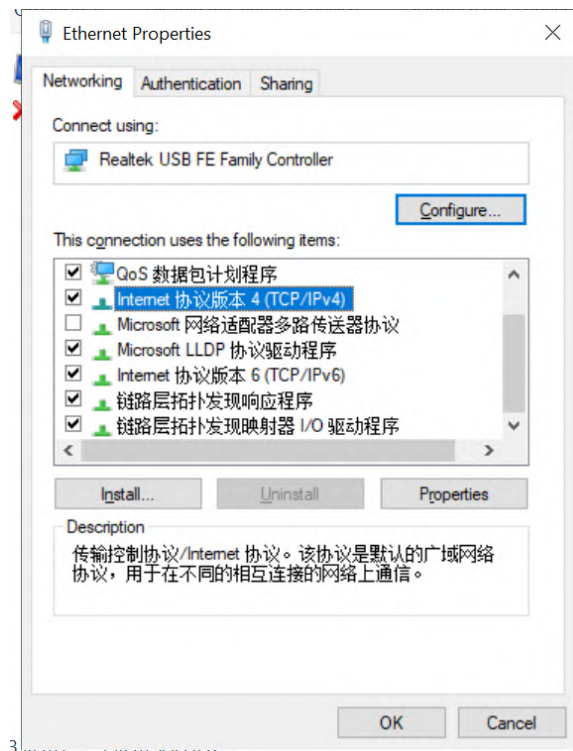


3. Config IP for i73+.

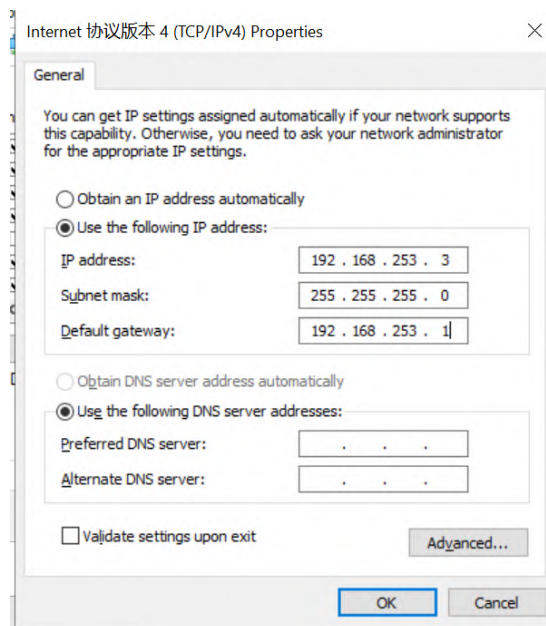
- a) After installing the driver, there will show another Ethernet connection in Network connections.



- b) Go to properties, and double click IPV4 to change the IP address.



c) Change the IP address, Subnet mask and Default gateway as following:

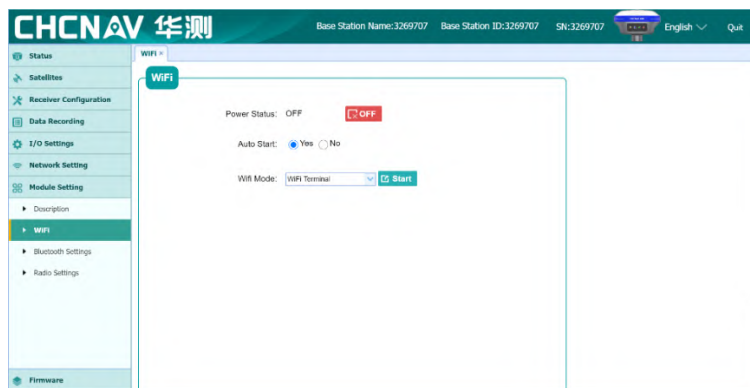


4.Login into i73+ webpage in Chrome by inputting: 192.168.253.1, keep same as the default gateway.

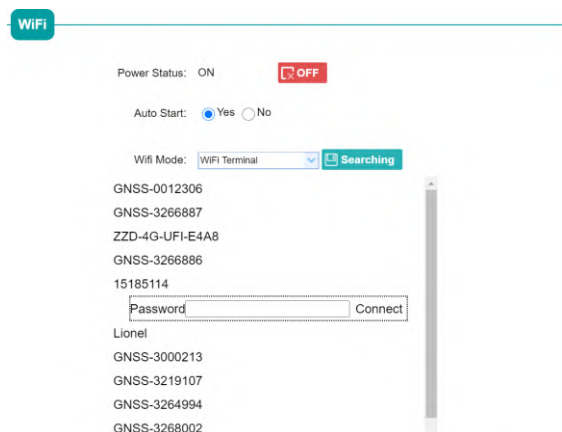


5. Config i73+ to connect Wifi and work as APIS base.

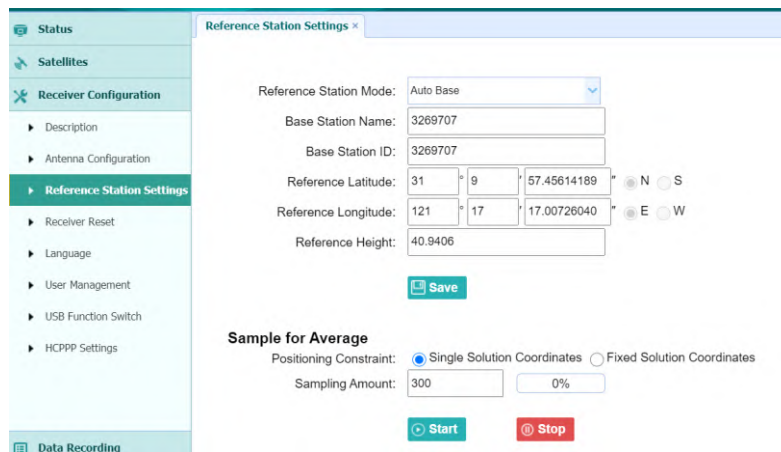
a) Go to Module Setting -> WiFi, change WiFi mode to WiFi Terminal.



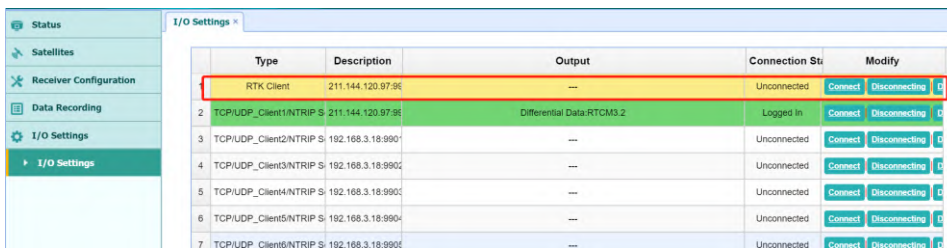
b) Click Start to searching the wifi and connect.



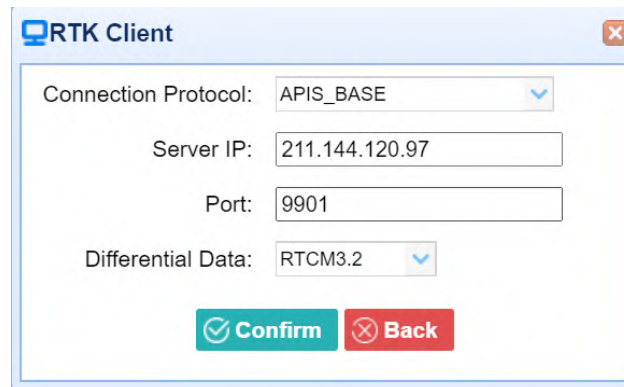
c) Go to Receiver Configuration -> Reference Station Settings. Set i73+ as auto base, and get the base station.



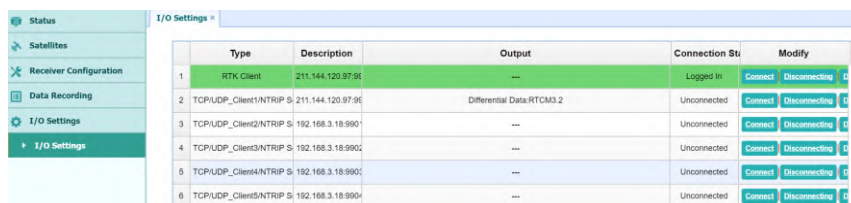
d) Go to I/O settings, in RTK Client, config it.



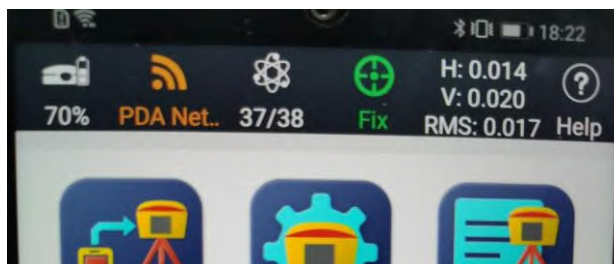
e) Connect Connect and config it as APIS base, use local APIS address. Then click Confirm to set.



f) After send correction data to APIS server successfully, the RTK Client option will become green background.



g) Then set rover as APIS rover, and it will get fix solution.

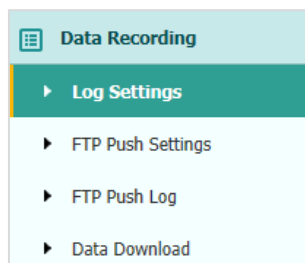


5.3.8 HCPPP Settings

Reserved for HCPPP.

5.4 Data Recording Menu

Use the Data Logging menu to set up the receiver to log static GNSS data and to view the logging settings. You can configure settings such as observable rate, recording rate, continuous logging limit, and whether to auto delete old files when memory is low. This menu also provides the controls for the FTP push feature:



5.4.1 Log Settings Submenu

Here shows the data logging status, including internal and external storage usage and data logging status of each session. Also, users can configure the data logging settings for each session, including recording name, store location, storage limit, store formats, start time, etc.

Log Settings >

Store Info			
	Position	Total Storage	Storage Available
1	Internal Storage	6750MB	6576MB
2	External Storage	0MB	0MB

Attention: Total assigned storage size should be less than 6GB. It will stop recording when the storage is full.

Record Info							
Recording Numbr	File Name	Activated	Log Status	Setting Parameter	Switch	Clear Data	
1	record1	Yes	Recording	Modify Detail	<input type="checkbox"/> ON <input type="checkbox"/> OFF	<input type="button" value="Clear"/>	<input type="button" value="Clear All"/>

To edit the settings of each session, click the **Modify** button to the right of the required session, and then the *Recording Edit* screen appears:

Recording Edit ✕

Auto Record: Yes No

Sample Interval: ▾

Elevation Mask: (°)

Duration Time: (Minute)

Site Name:

Antenna Height:

Measure Way: ▾

Storage Format: ▾

RINEX Version: ▾

Click advanced to see more settings.

Site Name:
Advanced

Start Date: Yes No

Apply Time: Yes No

Integral Point Store: Yes No

Circulating Memory: Yes No
the data overwritten first file after storage space is full

Repeat Observations: Yes No
Turn on to record a single observation. Turn off to record repeated observations.

Store Location:

Assigned Storage: (MB)

Observer:

Observe Agency:



FTP Push:

Close
 1:ftp server 1
 2:ftp server 2
 3:ftp server 3

Save
 Back

In this screen, you can configure all the data logging parameters, and determine whether the recording files will be affected by the FTP Push. The parameters are mainly as follows:

- **Auto Record:** on or off.
- **Sample Interval:** Select the observable rate from the dropdown list.
- **Elevation Mask:** Enter the elevation mask.
- **Duration Time:** Set the duration of data logging.
- **Site Name:** Enter the name of the site.
- **Antenna Height:** the measured height value.
- **Measure way:** Antenna Phase Center, Vertical Height, Slant Height
- **Storage Format:** Select the format of the data store.
- **RINEX Version:** OFF, 3.02, 2.11
- **Start Date:** Select **Yes** or **No** option to determine whether to auto record start date.
- **Apply Time:** Select **Yes** or **No** option to determine whether to auto record apply time.
- **Integral Point Store:** Select **Yes** or **No** option to determine whether to allow receiver to save data every hour.
- **Circulating Memory:** Select **Yes** or **No** option to determine whether to auto delete old files if the storage space is full.
- **Repeat Observations:** Select **Yes** or **No** option to determine whether to turn on to record a single observation.
- **Store Location:** Internal Storage, External Storage.
- **Assigned Storage:** The assigned memory size of current thread(for example, Record 1) is 10000MB
- **Observer:** Enter the name of observer.
- **Observer Agency:** Enter the name of observer agency.
- **FTP Push:** Decide whether to push the stored files to the FTP server of your choice.

Tap  **Save** button to save the settings and back to the *Log Settings* screen. Also, users can click  **Back** to abandon the changed settings and back to *Log Settings* screen.

Note – To modify data logging parameters, make sure the data logging session is switched off.

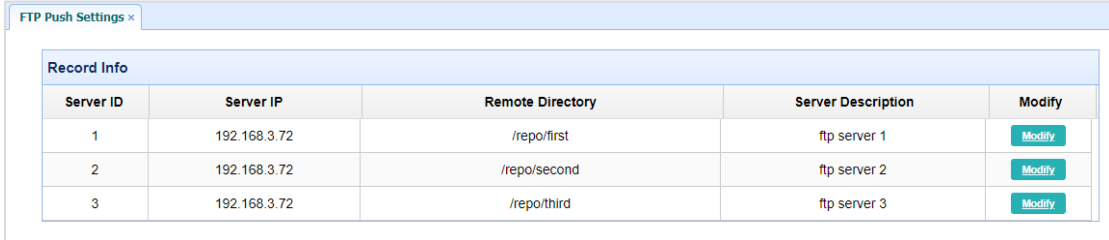
To switch on or off **ANY** data logging session, tap the **ON** or **OFF** button on the right of the required session.

To delete the recorded files of **ANY** data logging session, tap the **Clear** button on the right of the required session.




To delete the recorded files of **ALL** data logging sessions, tap the **Clear ALL Accounts** button.

5.4.2 FTP Push Settings Submenu

Use this screen to configure the receiver to push stored files to the FTP server of your choice. Only files that are configured to use FTP push are transmitted.



The screenshot shows the 'FTP Push Settings' screen with a table titled 'Record Info'. The table has five columns: 'Server ID', 'Server IP', 'Remote Directory', 'Server Description', and 'Modify'. There are three rows of data, each with a 'Modify' button in the 'Modify' column.

Server ID	Server IP	Remote Directory	Server Description	Modify
1	192.168.3.72	/repo/first	ftp server 1	
2	192.168.3.72	/repo/second	ftp server 2	
3	192.168.3.72	/repo/third	ftp server 3	

Tap **Modify** button on the right of the required FTP server and the *FTP Push Settings* screen appears:

5.4.3 FTP Push Log Submenu

Shows the related information about the recorded files that be pushed. And users can tap **Clear Ftp Send Log** button in the upper right corner to clear the log of FTP Push operations.

Server ID	Push File	File Size	Push Time	Push Successful Or Not
Clear FTP Push Log				
Displaying 0 to 0 of 0 items				

5.4.4 Data Download Submenu

In this submenu, users can download the data files that recorded in the internal storage through the internal FTP site.

1. Click this submenu, and then the log on dialogue box will prompt you to enter a user name and password:

Sign in

ftp://192.168.1.1

Your connection to this site is not private

Username

Password

The default logon account for the internal FTP site is:

- User name: ftp
- Password: ftp

2. Click the directory named as “repo” to view and download the files currently stored on the receiver:

Index of /

Name	Size	Date Modified
System Volume Information/		8/9/19, 10:28:00 PM
repo_3225804/		7/16/19, 1:17:00 PM

3. To find the file need to be downloaded, click the name of data logging session → the date of file that be recorded → the format of the file → the name of the target file.

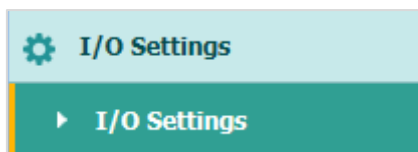
Index of /repo_3225804/

[\[parent directory\]](#)

Name	Size	Date Modified
push_log/		7/16/19, 1:17:00 PM
record_1/		8/15/19, 10:22:00 AM
record_2/		7/16/19, 1:17:00 PM
record_3/		7/16/19, 1:17:00 PM
record_4/		7/16/19, 1:17:00 PM
record_5/		7/16/19, 1:17:00 PM
record_6/		7/16/19, 1:17:00 PM
record_7/		7/16/19, 1:17:00 PM
record_8/		7/16/19, 1:17:00 PM

4. To download a file, left-click the name of the target file → download the file according to the prompts.

5.5 IO Settings Menu



Use the IO Settings menu to set up all receiver outputs and inputs. The receiver can output CMR, RTCM, Raw data, Ephemeris data, GPGGA, GPGSV, on TCP/IP, UDP, serial port, or Bluetooth ports.

5.5.1 IO Settings Submenu

The following figure shows an example of the screen that appears when you select this submenu. (serial port setting is reserved menu)

	Type	Description	Output	Connection Status	Modify
1	RTK Client	211.144.118.5:2102	---	Unconnected	Connect Disconnecting Detail
2	TCP/UDP_Client1/NTRIP Server1	192.168.3.18:9900	---	Unconnected	Connect Disconnecting Detail
3	TCP/UDP_Client2/NTRIP Server2	192.168.3.18:9901	---	Unconnected	Connect Disconnecting Detail
4	TCP/UDP_Client3/NTRIP Server3	192.168.3.18:9902	---	Unconnected	Connect Disconnecting Detail
5	TCP/UDP_Client4/NTRIP Server4	192.168.3.18:9903	---	Unconnected	Connect Disconnecting Detail
6	TCP/UDP_Client5/NTRIP Server5	192.168.3.18:9904	---	Unconnected	Connect Disconnecting Detail
7	TCP/UDP_Client6/NTRIP Server6	192.168.3.18:9905	---	Unconnected	Connect Disconnecting Detail
8	TCP Server/NTRIP Caster1	9901	---	Closed	Connect Disconnecting Detail
9	TCP Server/NTRIP Caster2	9902	---	Closed	Connect Disconnecting Detail
10	TCP Server/NTRIP Caster3	9903	---	Closed	Connect Disconnecting Detail
11	TCP Server/NTRIP Caster4	9904	---	Closed	Connect Disconnecting Detail
12	Serial Port	115200	---	---	Settings
13	Bluetooth	GNSS-3225804	GPGGA:5s,	---	Settings
14	Radio	456.0500MHz	---	---	Settings

In this submenu, users can configure 6 types of input and output settings.

1. RTK Client

After configuring the settings of RTK client, users can log on CORS or APIS. Tap the **Connect** button to the right → the *IO Settings* screen will appear → choose one of the connection protocols among the NTRIP, APIS_BASE, APIS_ROVER and TCP → configure the related parameters → click **Confirm** to log on CORS or APIS.

- Connection Protocol: NTRIP

The screenshot shows the 'RTK Client' configuration window with the following settings:

- Connection Protocol: NTRIP
- Server IP: 211.144.118.5
- Port: 2102
- Mount Point: asd (with a green checkmark and 'Get' text)
- User Name: zc
- Password: zc

Buttons at the bottom: Confirm (green), Back (red).

- Connection Protocol: APIS_BASE

The screenshot shows the 'RTK Client' configuration window with the following settings:

- Connection Protocol: APIS_BASE
- Server IP: 111.111.111.1
- Port: 9901
- Differential Data: OFF

Buttons at the bottom: Confirm (green), Back (red).

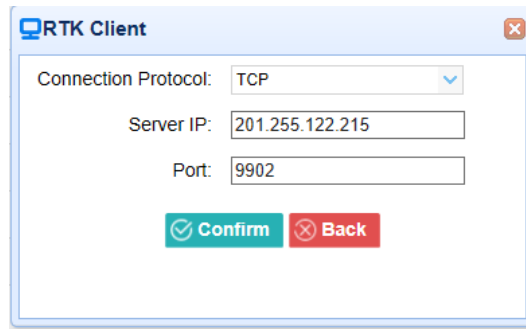
- Connection Protocol: APIS_ROVER

The screenshot shows the 'RTK Client' configuration window with the following settings:


- Connection Protocol: APIS_ROVER
- Server IP: 210.14.66.58
- Port: 9902
- Base ID: 1019923

Buttons at the bottom: Confirm (green), Back (red).

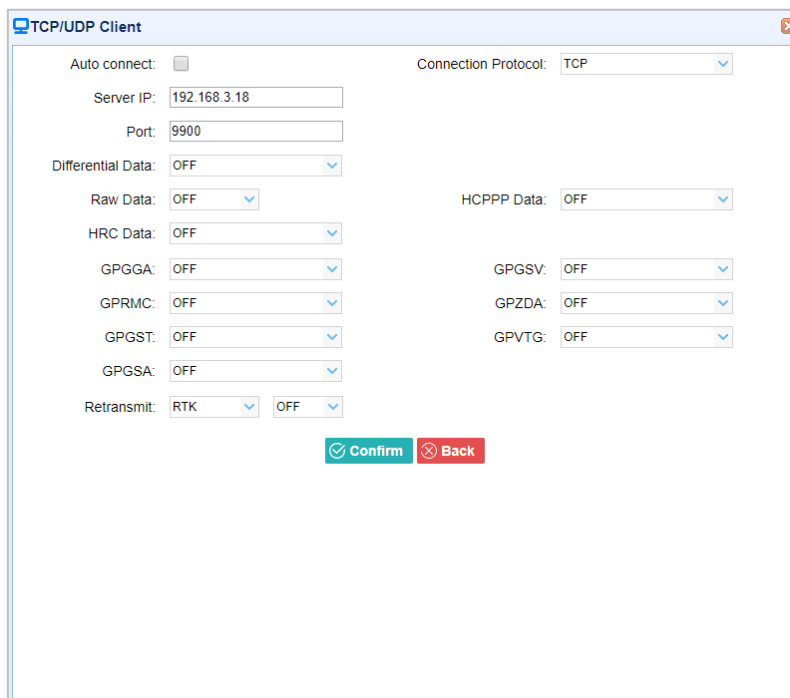
- Connection Protocol: TCP



2. TCP/UDP_Client/NTRIP Server

Tap the **Connect** button on the right of required TCP/UDP Client → the *IO Settings* screen will appear → select the connection protocol from TCP, UDP, NTRIP1.0 and NTRIP2.0 → enter the IP and Port of the target server → configure messages that you want to output to the target server → click  **Confirm** to save and complete the connection.

- Connection Protocol: TCP



➤ Connection Protocol: UDP

The screenshot shows the 'TCP/UDP Client' configuration window. The 'Connection Protocol' dropdown is set to 'UDP'. The 'Server IP' is '192.168.3.18' and the 'Port' is '9900'. The 'Auto connect' checkbox is unchecked. The 'Differential Data' dropdown is set to 'OFF'. The 'Raw Data' dropdown is set to 'OFF'. The 'HRC Data' dropdown is set to 'OFF'. The 'GPGGA' dropdown is set to 'OFF'. The 'GPRMC' dropdown is set to 'OFF'. The 'GPGST' dropdown is set to 'OFF'. The 'GPGSA' dropdown is set to 'OFF'. The 'Retransmit' dropdown is set to 'RTK'. The 'HCPPP Data' dropdown is set to 'OFF'. The 'GPGSV' dropdown is set to 'OFF'. The 'GPZDA' dropdown is set to 'OFF'. The 'GPVTG' dropdown is set to 'OFF'. At the bottom, there are 'Confirm' and 'Back' buttons.

➤ Connection Protocol: NTRIP1.0

The screenshot shows the 'TCP/UDP Client' configuration window. The 'Connection Protocol' dropdown is set to 'NTRIP1.0'. The 'Server IP' is '192.168.3.18' and the 'Port' is '9900'. The 'Auto connect' checkbox is unchecked. The 'Password' field is filled with '*****'. The 'Mount Point' field is empty. The 'Differential Data' dropdown is set to 'OFF'. The 'Raw Data' dropdown is set to 'OFF'. The 'HRC Data' dropdown is set to 'OFF'. The 'GPGGA' dropdown is set to 'OFF'. The 'GPRMC' dropdown is set to 'OFF'. The 'GPGST' dropdown is set to 'OFF'. The 'GPGSA' dropdown is set to 'OFF'. The 'Retransmit' dropdown is set to 'RTK'. The 'HCPPP Data' dropdown is set to 'OFF'. The 'GPGSV' dropdown is set to 'OFF'. The 'GPZDA' dropdown is set to 'OFF'. The 'GPVTG' dropdown is set to 'OFF'. At the bottom, there are 'Confirm' and 'Back' buttons.

➤ Connection Protocol: NTRIP2.0

The screenshot shows a web browser configuration window titled "TCP/UDP Client". The window contains the following fields and controls:

- Auto connect:**
- Server IP:**
- Password:**
- Mount Point:**
- Raw Data:** (dropdown)
- HRC Data:** (dropdown)
- GPGGA:** (dropdown)
- GPRMC:** (dropdown)
- GPGST:** (dropdown)
- GPGSA:** (dropdown)
- Retransmit:** (dropdown) (dropdown)
- Connection Protocol:** (dropdown)
- User Name:**
- Port:**
- Differential Data:** (dropdown)
- HCPPP Data:** (dropdown)
- GPGSV:** (dropdown)
- GPZDA:** (dropdown)
- GPVTG:** (dropdown)

At the bottom center of the window are two buttons: **Confirm** (green) and **Back** (red).

3. TCP Server/NTRIP Caster

Tap the **Connect** button to the right of required TCP Server/NTRIP Caster → the **IO Settings** screen will appear → select one of the connection protocols between NTRIP and TCP → configure the other related parameters → click **Confirm** to save the settings and open the server.

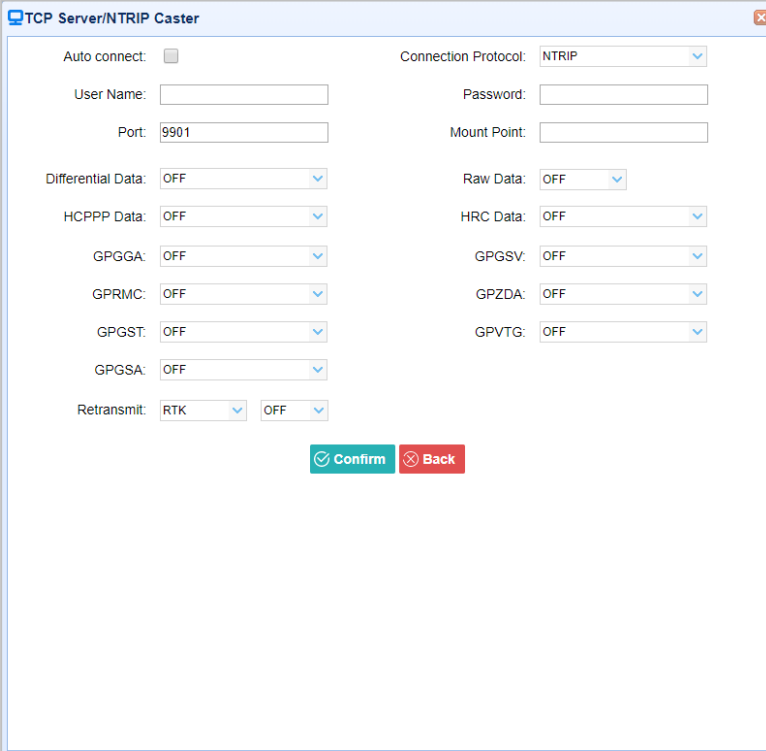
- Connection Protocol: TCP

The screenshot shows a configuration window titled "TCP Server/NTRIP Caster". It contains the following settings:

- Auto connect:
- Port: 9901
- Connection Protocol: TCP
- Differential Data: OFF
- HCPPP Data: OFF
- GPGGA: OFF
- GPRMC: OFF
- GPGST: OFF
- GPGSA: OFF
- Raw Data: OFF
- HRC Data: OFF
- GPZDA: OFF
- GPVTG: OFF
- Retransmit: RTK, OFF

At the bottom, there are two buttons: "Confirm" (green) and "Back" (red).

➤ Connection Protocol: NTRIP



TCP Server/NTRIP Caster

Auto connect: Connection Protocol: NTRIP

User Name: Password:

Port: 9901 Mount Point:

Differential Data: OFF Raw Data: OFF

HCPPP Data: OFF HRC Data: OFF

GPGGA: OFF GPGSV: OFF

GPRMC: OFF GPZDA: OFF


GPGST: OFF GPVTD: OFF

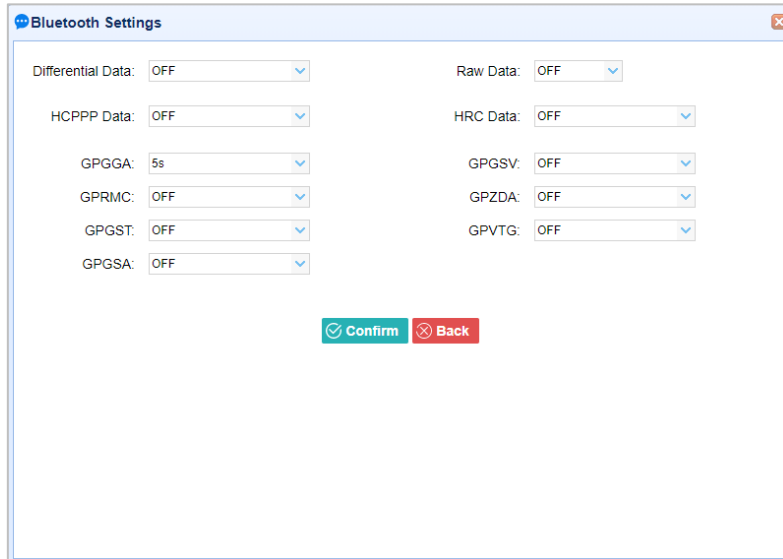
GPGSA: OFF

Retransmit: RTK OFF

Confirm Back

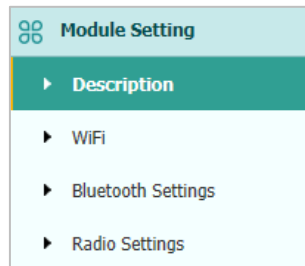
4. Bluetooth

Tap the **Settings** button to the right of Bluetooth → the *Bluetooth Set* screen will appear → configure the messages that you want to transmit through Bluetooth → click  to save the settings and start to transmit.



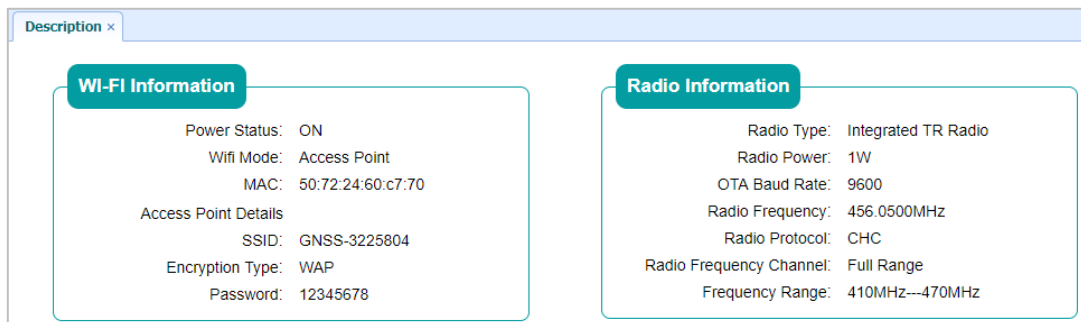
5.6 Module Setting Menu

Use this menu to check module information, configure WiFi, bluetooth, radio related settings.



5.6.1 Description Submenu

Use this submenu to check the information of WiFi module, bluetooth module and radio module.



5.6.2 WiFi Submenu

Use this submenu to turn on/off WiFi function and modify password.

WiFi

Power Status: ON OFF

Auto Start: Yes No

Wifi Mode: Access Point

SSID: GNSS-3461666

Start

5.6.3 Bluetooth Settings Submenu

Use this submenu to turn on/off bluetooth function and modify PIN number.

Bluetooth Settings ×

Bluetooth Settings

Local Name: GNSS-3225804

MAC Address: 50:72:24:60:C7:6F

PIN: 1234

Save

5.6.4 Radio Settings Submenu

Use this submenu to turn on/off radio function and configure radio parameters.

Radio Settings

Radio Status: ON ON OFF

Auto Start: Yes No

Radio Protocol: CHC v

Channel Bandwidth : 25 v (kHz)

OTA Baud Rate: 9600 v

Radio Power: 1W v

Radio Frequency: 1 v 456.0500 (410MHz--
-470MHz)

Save

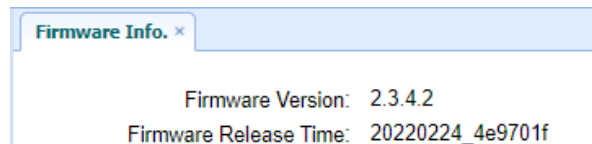
5.7 Firmware Menu

Use this menu to check the current firmware information, download the system log, update the receiver firmware, download or update the configuration file and register the receiver, and more:



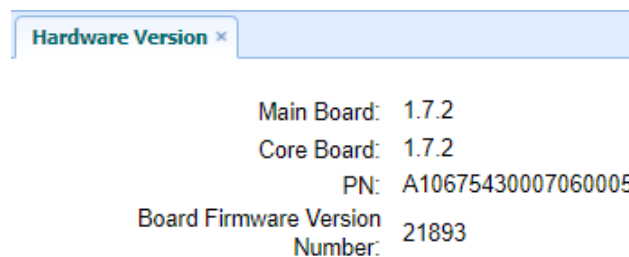
5.7.1 Firmware Info Submenu

Use this submenu to check the current firmware information. The following figure shows an example of the firmware information.



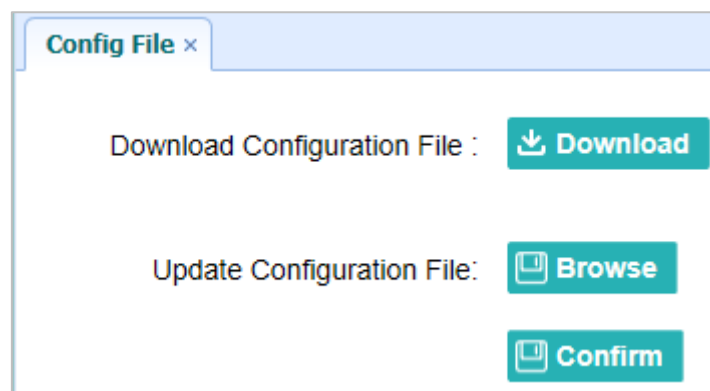
5.7.2 Hardware Version Submenu

Use this submenu to check the hardware information, including main board version and core board version:



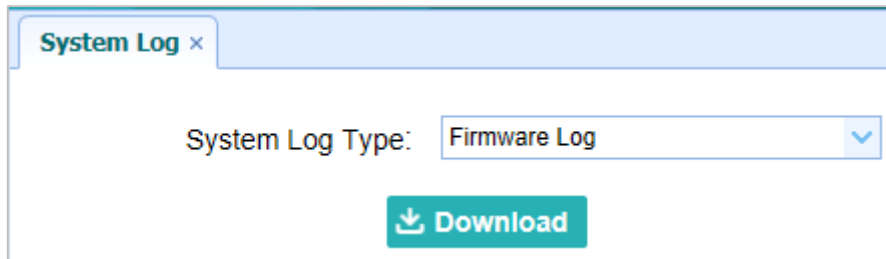
5.7.3 Config File Submenu

Use this submenu to update Configuration File.



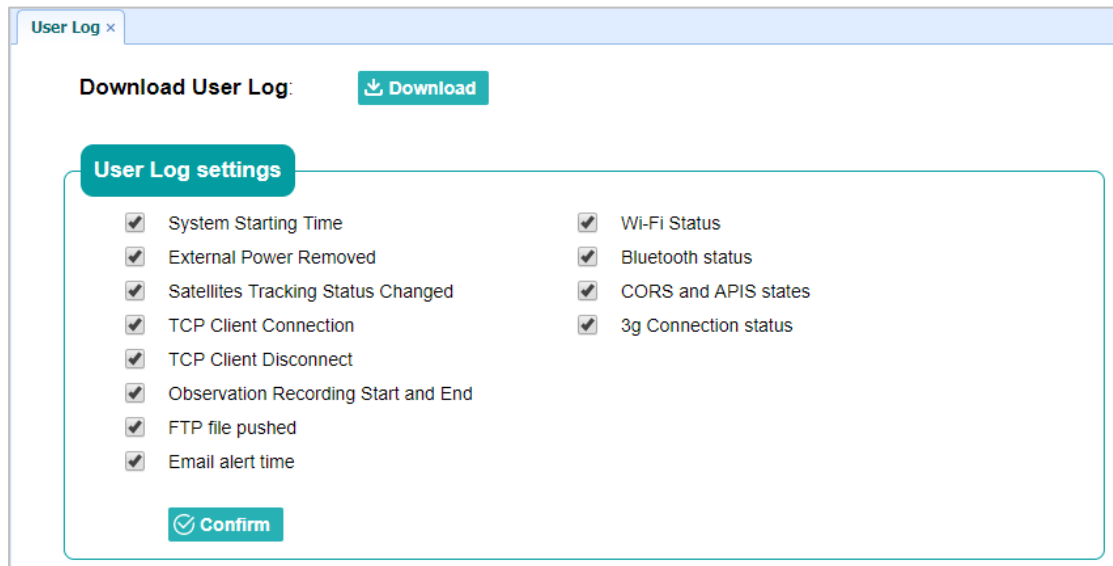
5.7.4 System Log Download Submenu

Use this submenu to download the system log of the receiver.



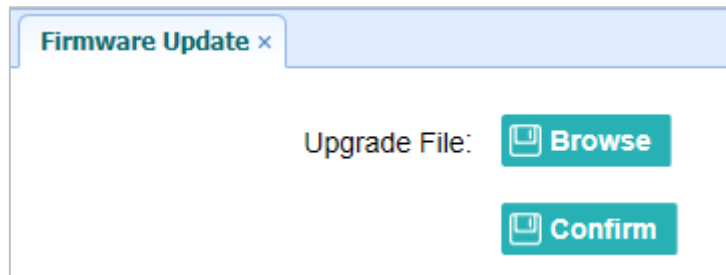
5.7.5 User Log Submenu

Use this submenu to download the user log. Tap **Download** to download current user log; Tick items that you want to see on the user log and tap confirm button to confirm selected user log.



5.7.6 Firmware Update Submenu

Use this submenu to load new firmware to the receiver across the network. Tap the **Browse** button to locate the upgrade file → tap **Confirm** button to confirm the selected upgrading file and start upgrading.

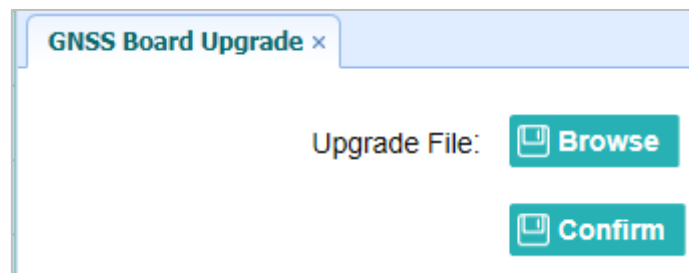


Notes

- It may take about 3 or 4 minutes to complete the firmware upgrading. Do not touch the power button or unplug the power until the upgrading process finishes, or damage will be caused to the receiver.
- The receiver will restart after the firmware upgrading is done, so users need to reconnect the receiver with your computer via Wi-Fi, and then log-in the receiver through a web browser to continue the configuration.

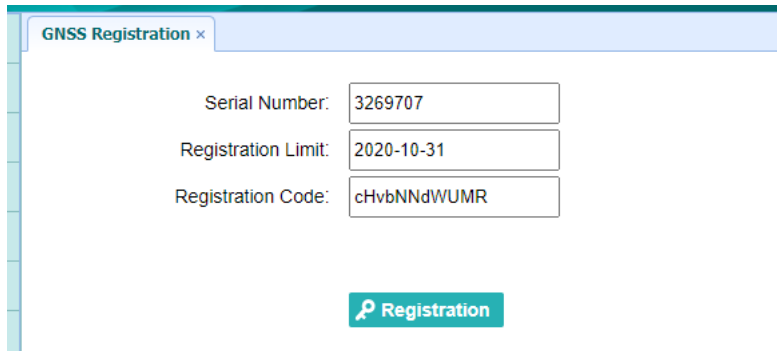
5.7.7 GNSS Board Upgrade Submenu

Use this submenu to upgrade GNSS Board. Use this submenu to load new board to the receiver across the network. Tap the **Browse** button to locate the upgrade file → tap **Confirm** button to confirm the selected upgrading file and start upgrading.



5.7.8 GNSS Registration Submenu

Use this submenu to register the receiver. Paste or enter the registration code to the *Registration Code* field → tap **Registration** button to complete the registration.



The screenshot displays the 'GNSS Registration' submenu. It features three input fields: 'Serial Number' with the value '3269707', 'Registration Limit' with the value '2020-10-31', and 'Registration Code' with the value 'cHvbNNdWUMR'. Below these fields is a teal button labeled 'Registration' with a key icon.

Serial Number:	3269707
Registration Limit:	2020-10-31
Registration Code:	cHvbNNdWUMR

Registration



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1) FCC 15.19

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.

2) FCC 15.21

Warning: Changes or modifications to this unit not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

3) FCC 15.105

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

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.

4) FCC RF Exposure- portable

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 & your body.