EFIX® F4 Geodetic GNSS Receiver

User Guide

Revision 1.0

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Building the intelligent world with precise time and space.

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Preface

Copyright

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.

1 Introduction

The F4 GNSS Receiver User Guide describes how to set up and use the EFIX F4 GNSS receiver.

In this manual, “the receiver” refers to the F4 GNSS receiver unless otherwise stated.

Even if you have used other Global Navigation Satellite Systems (GNSS) products before, EFIX recommends that you spend some time reading this manual to learn about the special features of this product. If you are not familiar with GNSS, go to www.efix-geo.com for an interactive look at EFIX and GNSS.

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.

1.1.2 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 F4 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.

1.1.3 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.

1.2 Technical Support

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

If you need to contact EFIX technical support, please contact us by email support@efix-geo.com

1.3 Disclaimer

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

1.4 Your Comments

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

2 Getting Started with F4

2.1 About the Receiver

The F4 GNSS receiver incorporates a GNSS engine, GNSS antenna, internal radio (410 MHz – 470 MHz), 4G cellular modem, Bluetooth and Wi-Fi in a ruggedized and miniature unit that is easy for you to set up an all-in-one RTK rover or mobile base station. Bluetooth and Wi-Fi technology provide cable-free communication between the receiver and controller.

The receiver can be used as the part of a RTK GNSS system with EFIX eField software. And you can download the GNSS data that recorded in the internal memory of receiver to a computer.

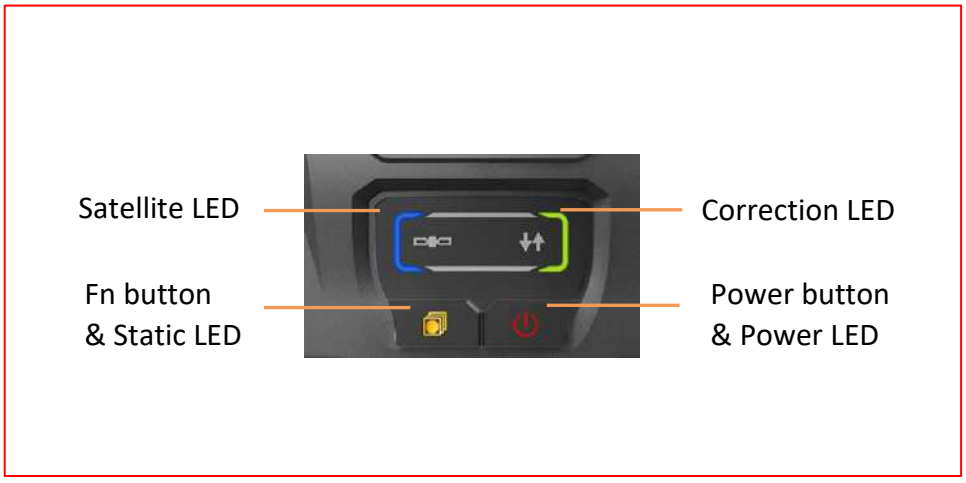
To configure the receiver for performing a wide variety of functions, you can use the web interface by connecting the receiver with PC or smartphone through Wi-Fi.

2.2 Parts of the Receiver

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

2.2.1 Front Panel

The following figure shows the front panel of the receiver, it contains two indicator LEDs and two buttons.



Name	Description
Satellites LED (blue)	• When the receiver is searching satellites, the green LED flashes once every 5 seconds • When the receiver has tracked N satellites, the green LED will flash N times every 5 seconds.
Correction LED(Green)	• Indicates whether the receiver is transmitting/receiving differential data. • The LED flashes once per second when As a Base station (orange): successfully transmitting differential data. As a Rover station (orange): successfully receiving differential data from Base station but float. As a Rover station (green): successfully receiving differential data from Base station and fix.
Static LED (orange)	If F4 is recording static data: • If the recording rate is larger than 1 s, the static LED will flash as the setting rate. • If the recording rate is less than 1 s, the static LED will flash twice per every second.
	If the memory of F4 is full, the static LED will keep awake.
	If F4 is in APIS mode, the static will keep 3 s awake per 10 s.
Power LED	If F4 has already powered on: • If the power of internal battery is more than 20% or the receiver is charging via 7-pin port, the power LED (green) will keep awake. • If the power of internal battery is less than 20%, the power LED (red) will flash once every second.

Power Button	Works as a Power button.
Function Button	Turn on/off the static data recording: • Switch to static mode when pressed for 3 s, the static LED (orange) shines for 2 s.
	If press the function button quickly: • If F4 works with RTK mode, the static LED (orange) will flash. • If F4 is recording static data, the correction LED (green) will flash.
	When keep function button pressed, press power button 5 times continuously, the board of F4 will reboot and research satellites.

2.2.2 Receiver Back and Bottom

The following figures show the back and bottom view of the receiver.

Name	Description
SIM card slot	One micro SIM card slot (12 mm × 15 mm) provides 4G network solution.

No.	Name	Description
a	IO port	• A 7-pin LEMO connector for RS-232 communications and external power (9 VDC to 36 VDC) input. • Use the GPS to PC data cable to realize RS-232 communications between the receiver and computer or controller.

		• Use the GPS to PC data cable to transmit differential data to an external radio.
b	Radio antenna connector	• A TNC connector for external UHF antenna. • Use external UHF antenna to transmit or receive UHF signals.
c	5/8” 11 TPI threaded insert	• A 5/8” 11 TPI threaded insert to connect a centering pole or a tribrach adaptor.

2.3 Battery and Power

2.3.1 Internal Battery

The receiver has an internal Lithium-ion battery, which can not be removed for charging.

2.3.2 External Power Supply

There is one recommended method for providing the external power (9 V DC to 36 V DC):

Connect the receiver to a vehicle battery by using the external power cable.

 WARNING - Use caution when connecting external power cable's clip leads to a vehicle battery. Do not allow any metal object to connect (short) the battery's positive (+) terminal to either the negative (-) terminal or the metal part of the vehicle battery. This could result in high current, arcing, and high temperatures, exposing the user to possible injury.

2.4 Inserting SIM Card

(a) Open the cover.
(b) Insert the SIM card with the contacts facing upward, as indicated by the SIM card icon next to the SIM card slot.
(c) Close the cover to prevent water immersion.
(d) To eject the SIM card, slightly push it in to trigger the spring-loaded release

mechanism.

Note: The SIM card is provided by your cellular network service provider.

2.5 Product Basic Supply Accessories

2.5.1 Base Kit Basic Supply

Item	Picture
F4 Geodetic GNSS Receiver	
UHF Bar Antenna (410-470 MHz)	
GPS to PC Data Cable	
Charging Cable	

H.I. Tape	
Extension pole	
Tribrach with optical plummet	
Auxiliary H.I. Tool	
Tribrach adaptor	
Transport Hard Case	

2.5.2 Rover Kit Basic Supply

Item	Picture
F4 Geodetic GNSS Receiver	
UHF Bar Antenna (410-470 MHz)	

GPS to PC Data Cable	
Charging Cable	
2M Range Pole w/bag	
Auxiliary H.I. Tool	
Transport Hard Case	

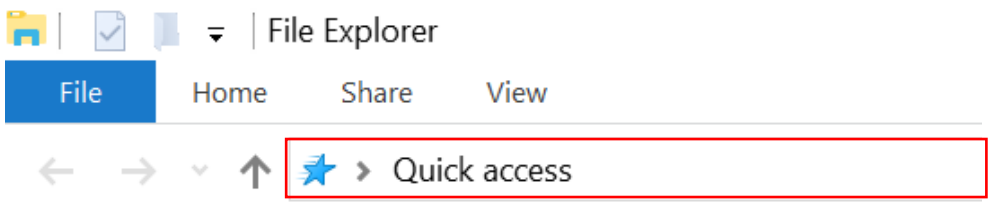
2.6 Downloading Logged Data

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 EFIX Geomatics Office Software 2.0 (CGO 2.0).

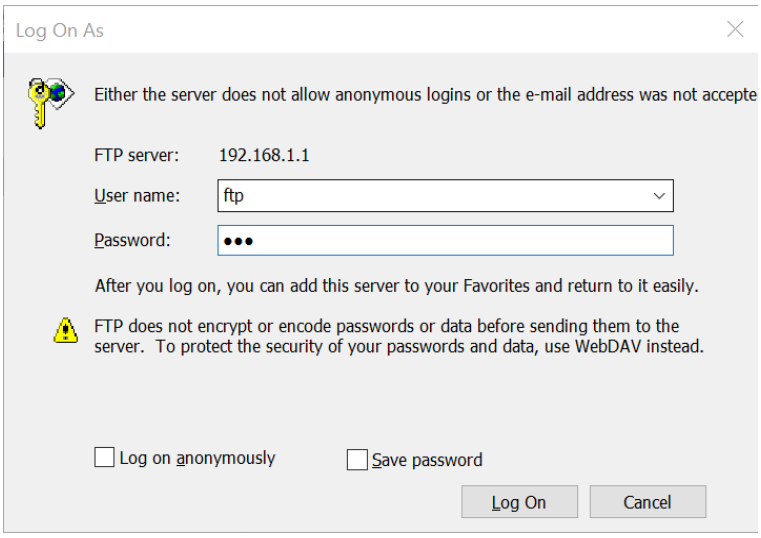
2.6.1 FTP Download

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

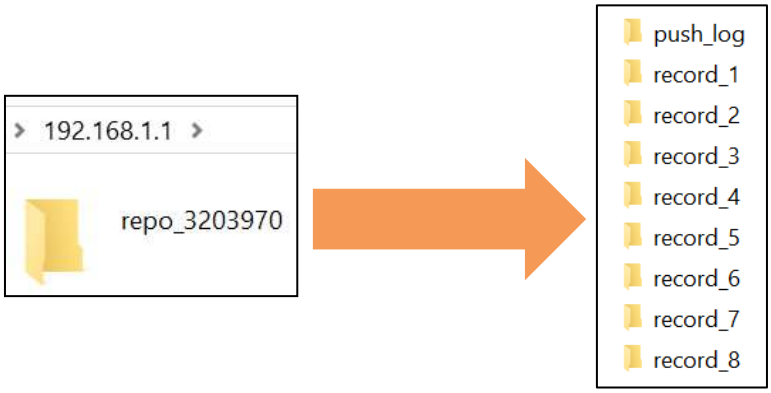
(1) Switch on the receiver, search its Wi-Fi in the computer and connect.
(2) After the successful connection, open the file manager in the computer and input “ftp:\\192.168.1.1” in the address box.



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



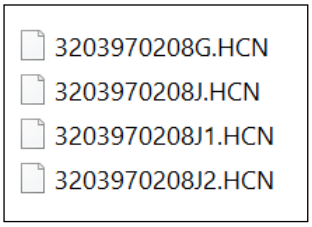
(4) Double click the folder “repo_receiver SN” (take 3203970 as example), you will see 9 folders. The “push_log” folder is used to save the log files, and the other 8 folders represent different logging sessions and are used for store static data.



(5) Double click the folder that you have configured to store the static data, you will see the folder(s) created by the F4 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 has 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 XXXXXXDDDNN, 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.

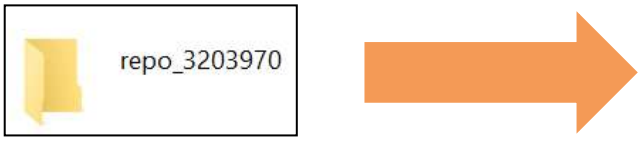
2.6.2 Web Server Download

The procedures of downloading logged data through web server refer to 5.4.4 Data Download Submenu.

2.6.3 USB Download

The procedures of downloading logged data through USB cable are as follows:

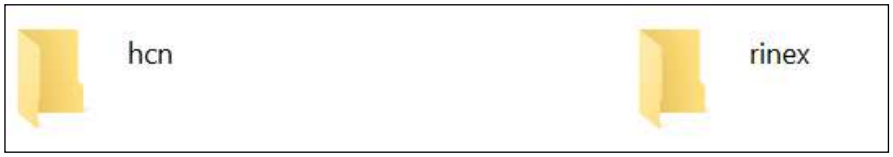
(1) Switch on the receiver, and connect it with a computer by USB Cable. After the successful connection, a removable disk named as the Serial Number (SN) of the receiver will appear on the computer.
(2) Double click the removable disk and you will see the folder named as "repo_receiver SN".
(3) Double 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.



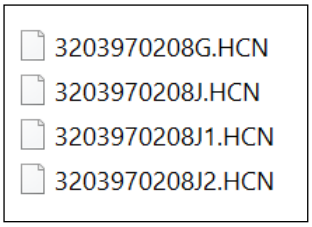
(4) Double click the folder that you have configured to store the static data, you will see the folder(s) created by the F4 system automatically and named by the date which is decide by GPS time when you start to log data.

(5) Select the destination folder and double click it, and then you can see several folders named with the date.

(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 has 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 XXXXXXDDDNN, where XXXXXX is the SN of the receiver, DDD is day of year, and NN is the recording session.

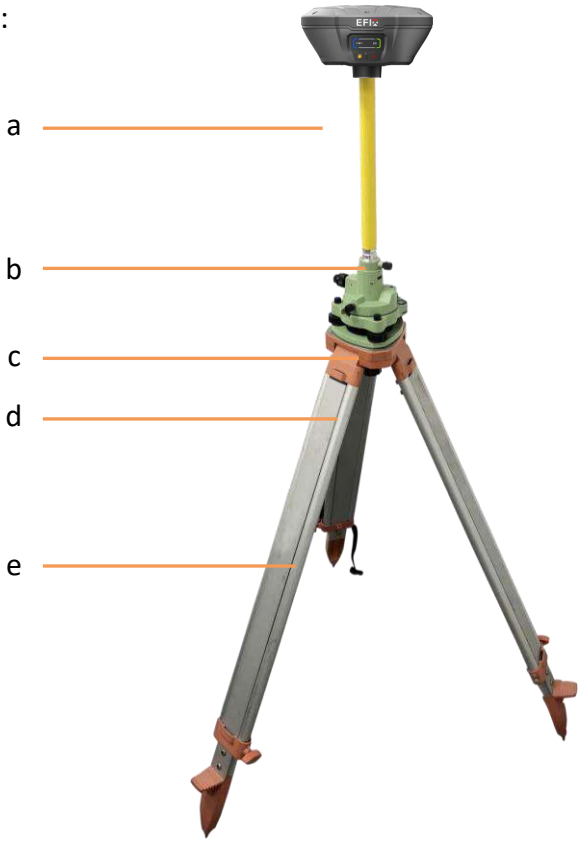
WARNING – The static data will be saved in the first logging session, the "record_1" folder, by default. Old files will be deleted if the storage space is full. If you configure not to auto delete old files when the memory is low, the receiver will stop data logging.

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	F4 GNSS receiver
b	Extension pole (30 cm)
c	Tribrach adaptor
d	Tribrach w/ Opti

e	Aluminum tripod

Steps:

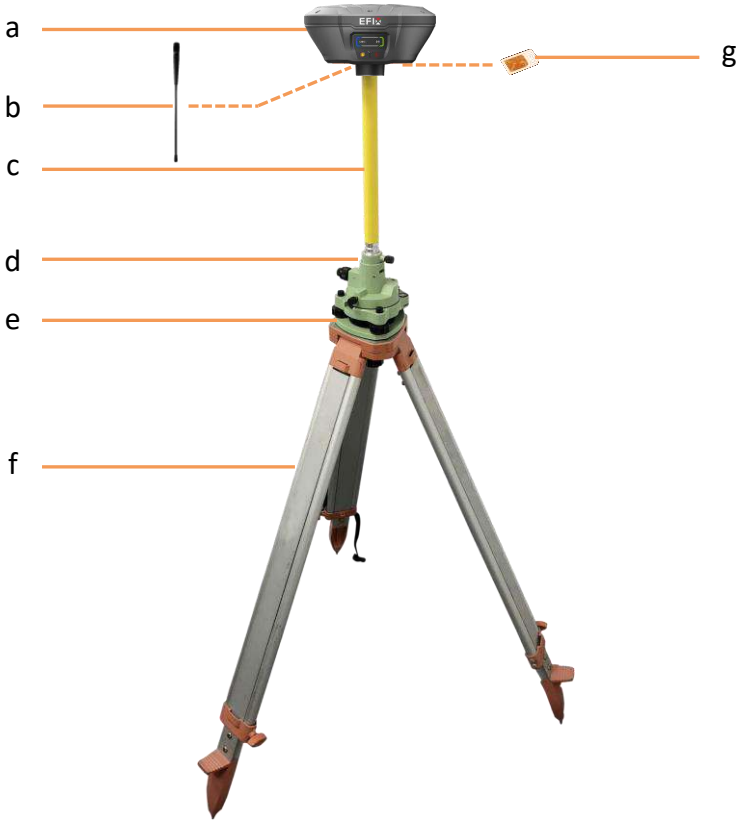
(1) Put tripod in the target position, center and level it roughly.
(2) Place and lock the tribrach in the tripod.
(3) Screw the receiver onto the tribrach.
(4) Center and level the receiver more precisely.
(5) Connect the receiver to external battery by using external power cable if necessary.
(6) Connect the receiver to external storage disk by using USB cable if necessary.
(7) Turn on the receiver by pressing the power button for 3 s.
(8) Measure the antenna height by using H.I. tape and auxiliary H.I. tool.
(9) Press the function button for 3 s to start recording static raw data.
If work with a data controller:
(10) Switch on the data controller and connect it to the receiver.
(11) Use software to configure the receiver as static mode.

3.2 Real-Time Base Station Setup

3.2.1 Internal Cellular or UHF

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

Components:



No	Name
a	F4 GNSS receiver
b	UHF whip antenna
c	Extension pole (30 cm)
d	Tribrach adaptor
e	Tribrach w/ Opti
f	Aluminum tripod
g	Micro SIM card (12 mm × 15 mm)

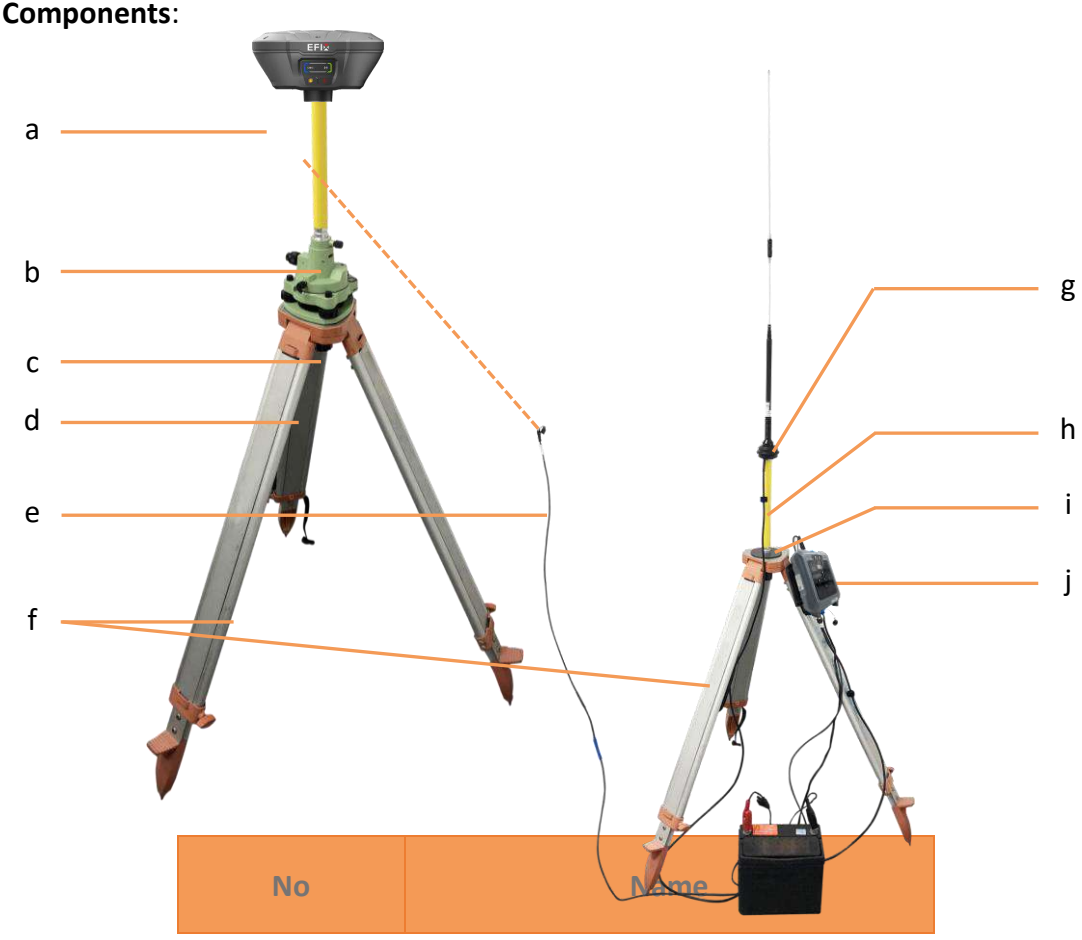
Steps:

(1) Put tripod in the target position, center and level it roughly.
(2) Place and lock the tribrach in the tripod.
(3) **If work as a cellular base station**, the SIM card need to be inserted.
(4) Screw the receiver onto the tribrach.
(5) Center and level the receiver more precisely.
(6) **If work as a UHF base station**, the UHF whip antenna need to be connected to the receiver.
(7) Connect the receiver to external battery by using external power cable if necessary.
(8) Connect the receiver to external storage disk by using USB cable if necessary.
(9) Turn on the receiver by pressing the power button for 3 s.
(10) Measure the antenna height by using H.I. tape and auxiliary H.I. tool.
(11) Switch on the data controller and connect it to the receiver.
(12) Use software to configure the receiver as cellular base or UHF base mode.

3.2.2 External UHF

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

Components:



a	F4 Geodetic GNSS receiver
b	Extension pole (30 cm)
c	Tribrach adaptor
d	Tribrach w/ Opti
e	GPS to datalink cable (power cable)
f	Aluminum tripod
g	3 m cable for datalink antenna
h	Datalink antenna mounting pole kit
i	Pole mounting
j	External UHF datalink

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 datalink by using GPS to datalink cable.
(6) Hang the external datalink on the tripod leg.
(7) Connect the receiver to external battery by using external power cable if necessary.
(8) Connect the receiver to external storage disk by using USB cable if necessary.
(9) Turn on the receiver by pressing the power button for 3 s.
(10)Measure the antenna height by using H.I. tape and auxiliary H.I. tool.
(11)Turn on the external datalink and configure it as need.

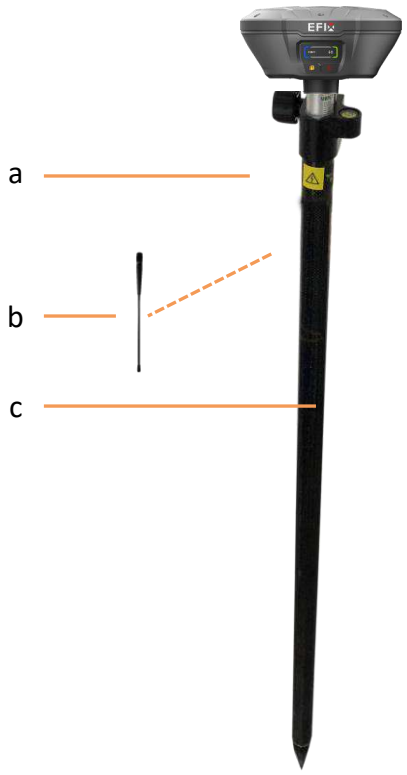
If work with a data controller:

(12)Switch on the data controller and connect it to the receiver.
(13)Use software to configure the receiver as cellular base or UHF base mode.

3.3 Real-Time Rover Station Setup

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

Components:



No	Name
a	F4 Geodetic GNSS receiver
b	UHF whip antenna
c	2M range pole w/ bag

Steps:

(1) **If work as a cellular rover station**, the SIM card need to be inserted.
(2) Screw the receiver onto the pole.
(3) **If work as a UHF rover station**, the UHF whip antenna need to be connected to

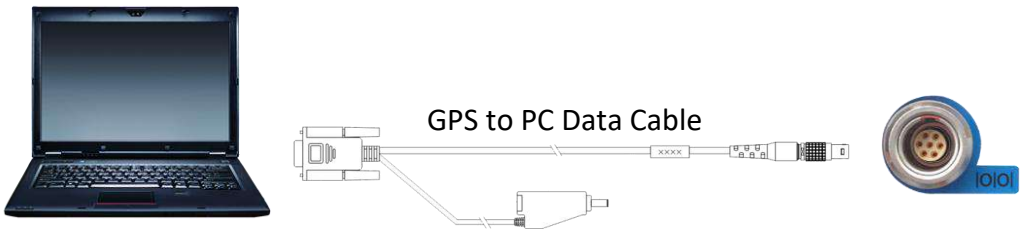
the receiver.

(4) Turn on the receiver by pressing the power button for 3 s.
(5) Switch on the data controller and connect it to the receiver.
(6) Use software to configure the receiver as cellular rover or UHF rover mode.
(7) Center and level the receiver more precisely.
(8) Use software to start survey.

4 Connecting to an Office Computer

The receiver can be connected to an office computer for upgrading firmware, configuring GNSS board parameters or outputting NEMA0183 data via a GPS to PC data cable. Before you connect to the office computer, ensure that the receiver is powered on.

The following figure shows how to connect to the computer:



Steps:

(1) Use the 7-pin LEMO port to connect to the receiver, and use the RS232 port to connect to the PC.
(2) Connect the receiver to the PC software for configuring upgrading firmware, configuring GNSS board parameters or outputting NEMA0183 data.

Note: To prevent the damage of the receiver caused by misoperation, please use the firmware provided by EFIX for upgrading.

5 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 of the receiver into the address bar of the web browser on your computer:

   http://192.168.1.1/pc/login.html

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 for the next time you enter this login screen.

5. Once you are logged 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, three 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, files being logged, and data streams being output. With this information, it is easy to tell exactly what functions the receiver is performing:

5.1.3 Google Map submenu

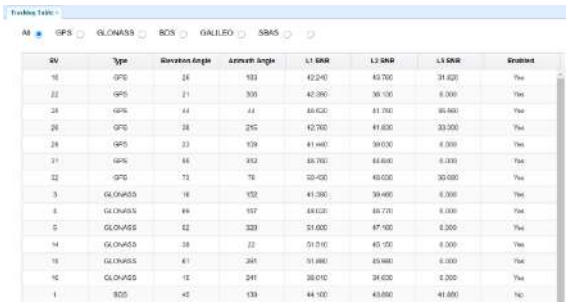
Tap this submenu to show the location of the receiver on Google map.

5.2 Satellites menu

Use the Satellites menu to view satellite tracking details and enable/disable GPS, SBAS, 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.

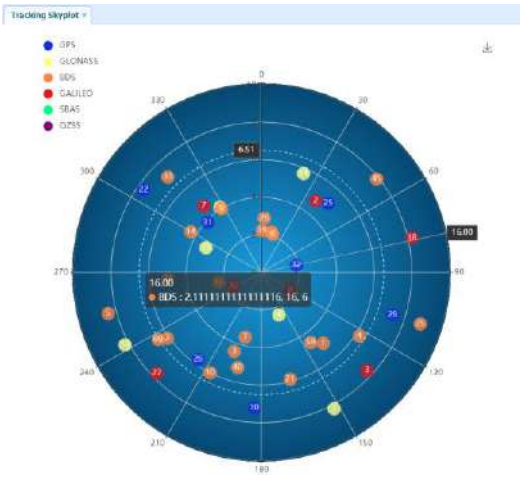


5.2.2 Tracking Info. Table submenu

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.

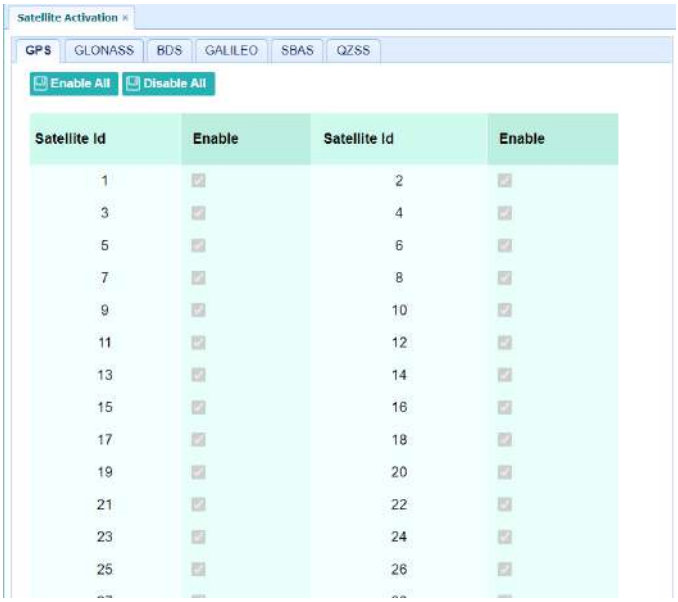
5.2.3 Tracking Skyplot submenu

The following figure is an example of Skyplot page.



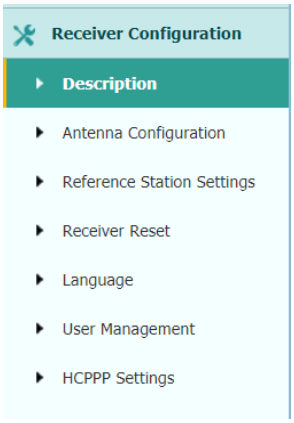
5.2.4 Satellite Activation submenu

Use this menu to enable or disable satellites.



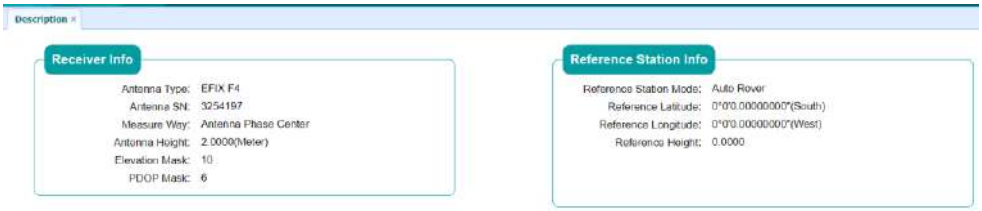
5.3 Receiver Configuration menu

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:



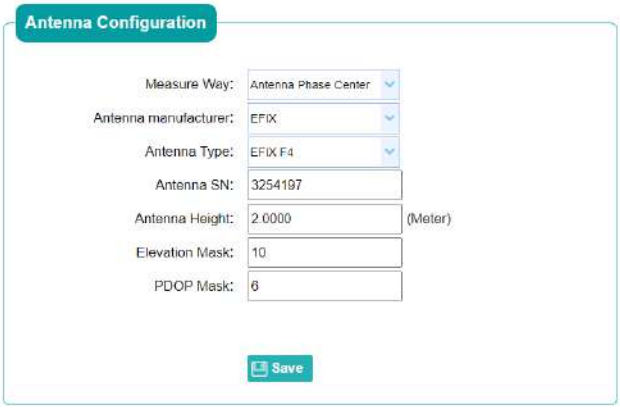
5.3.1 Description

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



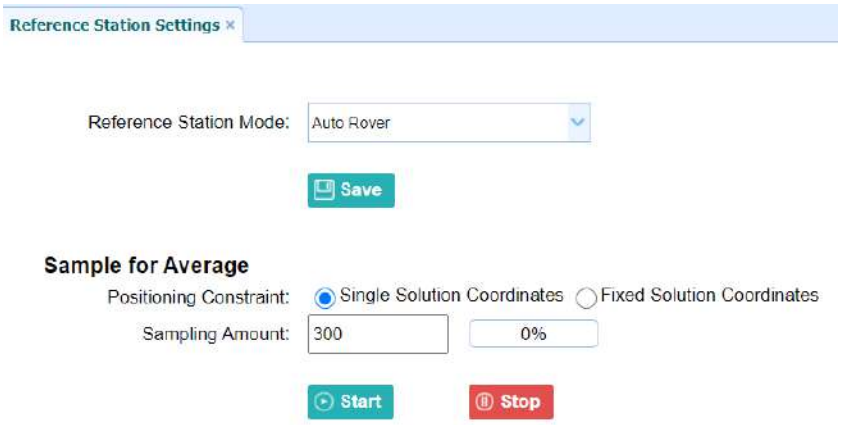
5.3.2 Antenna Configuration submenu

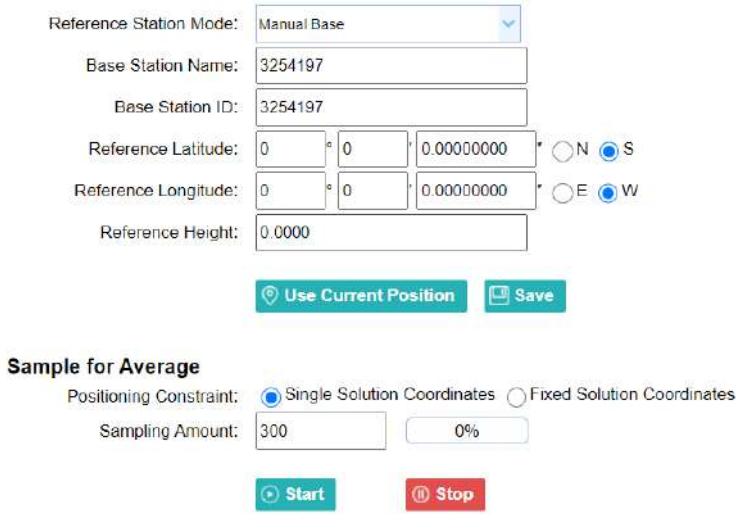
Use this screen to configure all of the items relating to the GNSS antenna. You must enter the correct values for all antenna-related fields, as the choices you make significantly affect the accuracy for logged data and broadcast correction data:



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 significantly affects the accuracy of logged data files and broadcast correction data:





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.
b) **Auto Base:** The receiver will serve as a base after this mode is enabled, and then broadcast correction data based on coordinate inputted by user, or obtained through autonomous positioning automatically.
c) **Manual Base:** The receiver will serve neither as a base or a rover after this mode is enabled. Users need to configure the receiver manually.

For **Reference Latitude** and **Reference Longitude**:

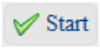
There are mainly three methods to enter the reference coordinates and shown as follows:

a) **Acquire Current Position**: Click this button to acquire current position obtained through autonomous positioning automatically.
b) **Manual Input**: Manually input the coordinate of a control point.
c) **From CORS**: After the receiver logging in CORS, the software can record the coordinate of current position based on fix solution.

For **Sample for Average**:

Users can determine the positioning limit and sampling amount. The positioning limit falls into two types:

a) **Single Solution Coordinates**: Collect the coordinates of receiver obtained through autonomous positioning.
b) **Fixed Solution Coordinates**: Only collect coordinates of receiver with a fixed solution.

After the configuration of positioning limit and sampling amount, click 

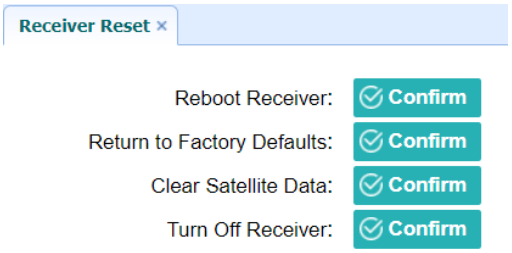
to carry out sampling and averaging → the progress bar will show the progress → the result will be served as the coordinate of current positon.

If users need to save the changes, please tap 

button.

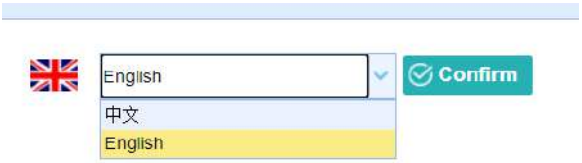
5.3.4 Receiver Reset submenu

Use this screen to completely or partially reset the receiver:



5.3.5 Languages submenu

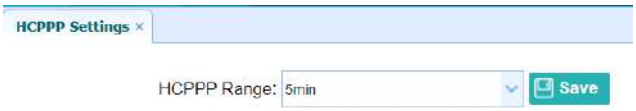
Use this screen to select the web interface language:



5.3.6 User Management submenu

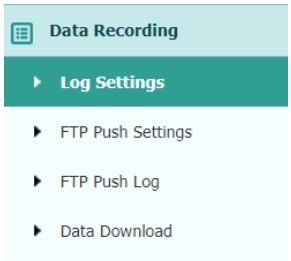
5.3.7 HCPPP Settings submenu

Use this menu to select HCPPP Range.



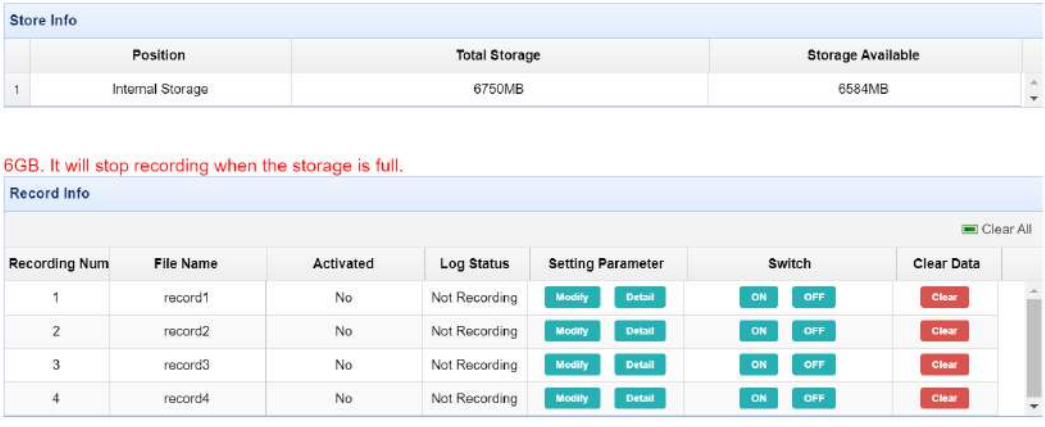
5.4 Data Recording menu

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 if memory is low. This menu also provides the controls for the FTP push feature:



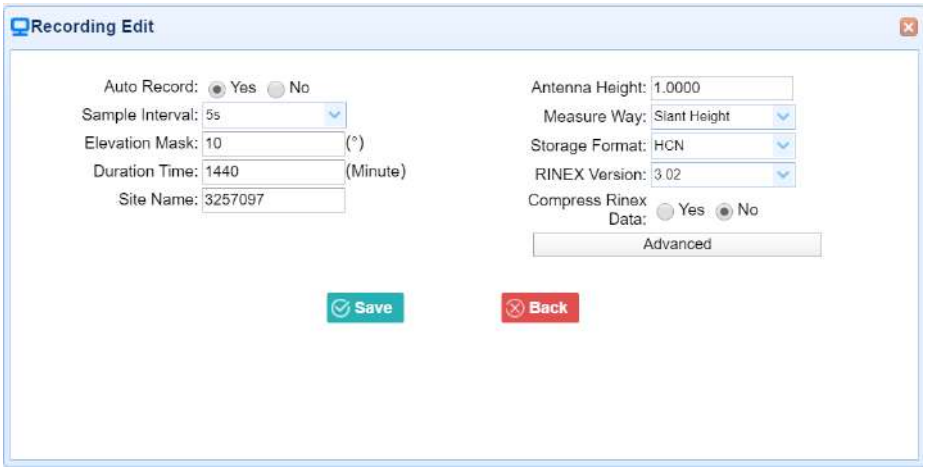
5.4.1 Log Settings submenu

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

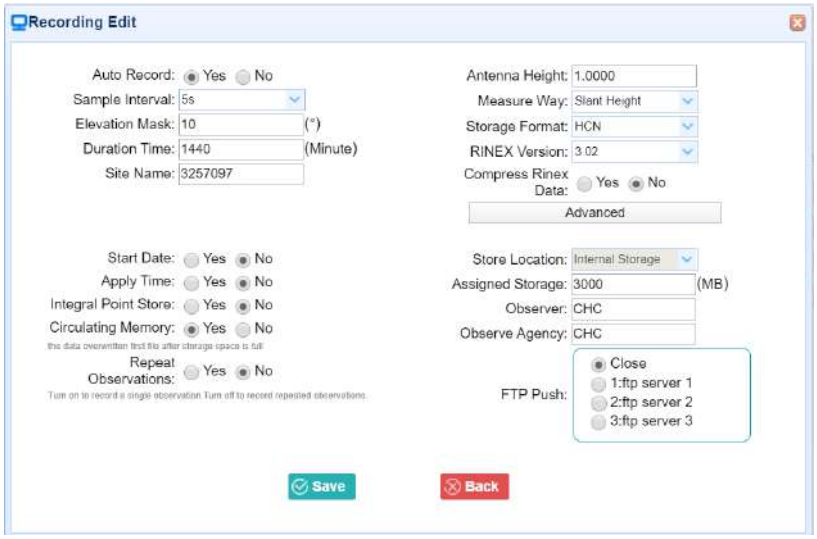


for each session, including recording name, store location, storage limit, store formats, start time, etc.

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:



Click advanced to see more settings.



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:

- **File Name**: The name of this logging session.
- **Sample Interval**: Select the observable rate from the dropdown list.
- **Store Location**: Determine whether to store at internal storage or external storage.

- **Enable Start Time**: Set the start time of data logging in UTC. Select **Or not** option below to determine whether to start data logging from the start time defined, or immediately after this session is switched on.
- **Duration Time**: Set the duration of data logging.
- **Assigned Storage**: Set the storage space of this session.
- **Circulating Memory**: Select **Yes** or **No** option to determine whether to auto delete old files if the storage space is full.
- **Data Format**: Set the data format of the logged data.
- **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.

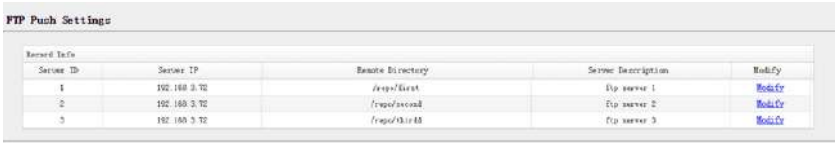
To switch on or off **ANY** data logging session, tap the **ON** or **OFF** button to the right of the required session.

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

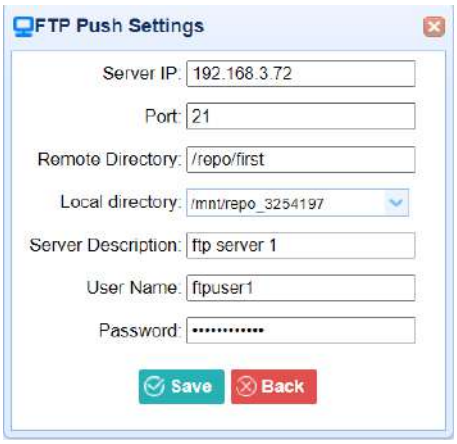
To delete the recorded files of **ALL** data logging sessions, tap the **Clear ALL Accounts** button.

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.

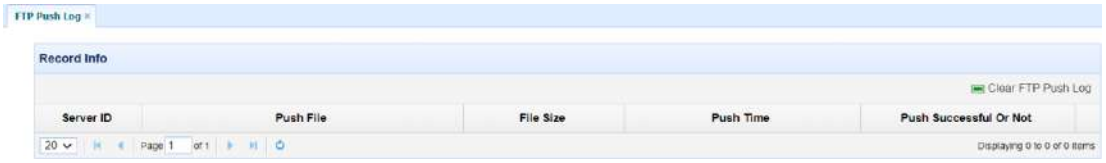


Tap **Modify** button to the right of the required FTP server and the *FTP Push Settings* screen appears:



5.4.3 FTP Push log submenu

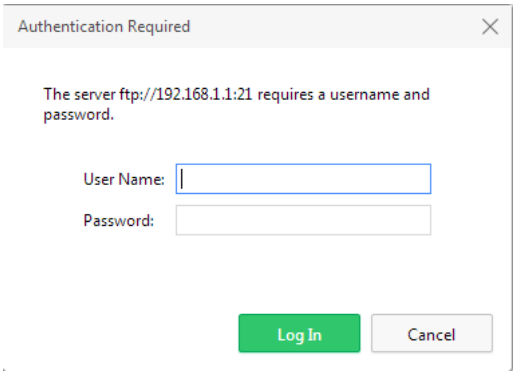
Shows the related information about the recorded filed that be pushed. And users can tap **Clear Ftp Send Log** button in the upper right corner to clear the log of FTP Push operations.



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:



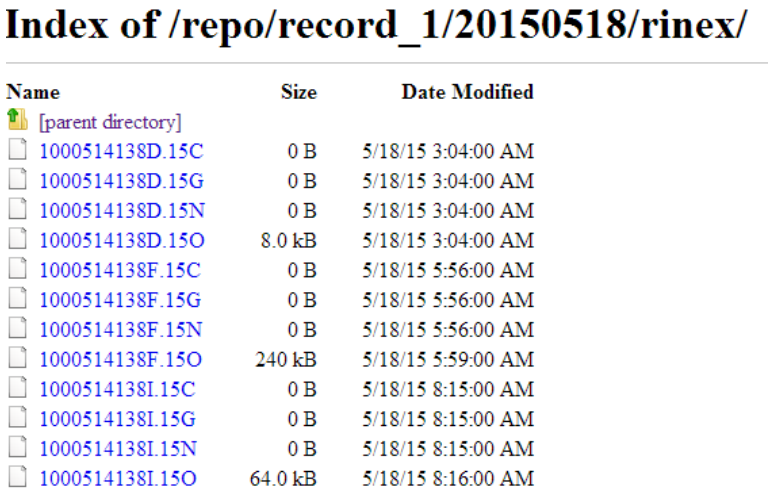
The default logon account for the internal FTP site is:

- User name: ftp

- Password: ftp

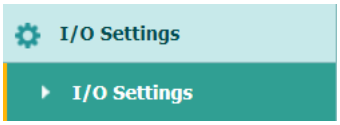
2. Click the directory named as “repo” to view and download the files currently stored on the receiver:

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.



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

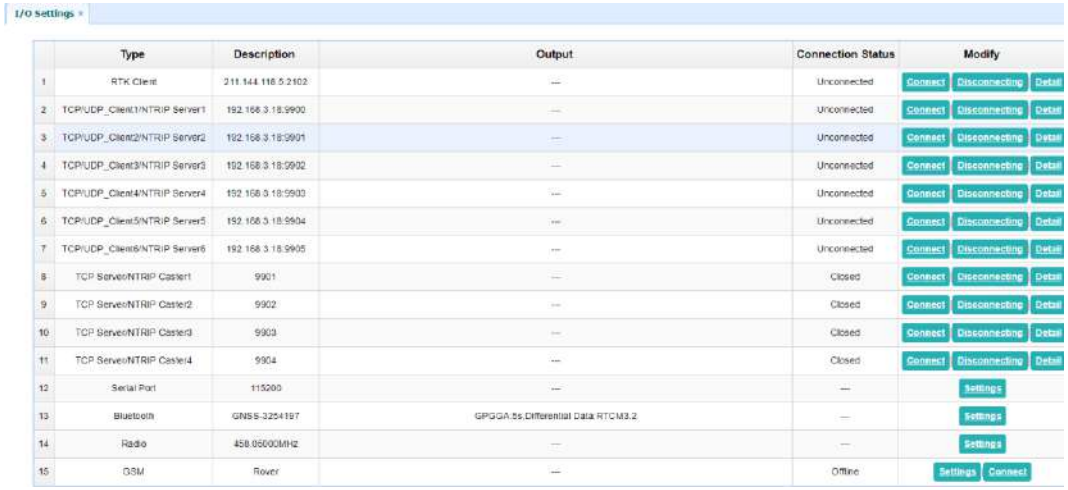
5.5 IO Settings menu



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

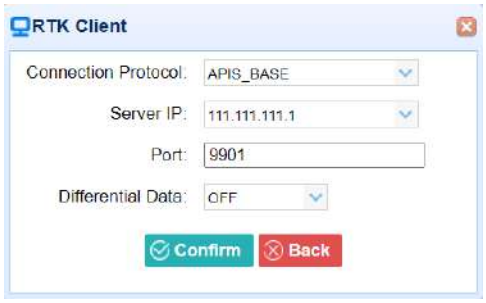
The following figure shows an example of the screen that appears when you select this submenu.



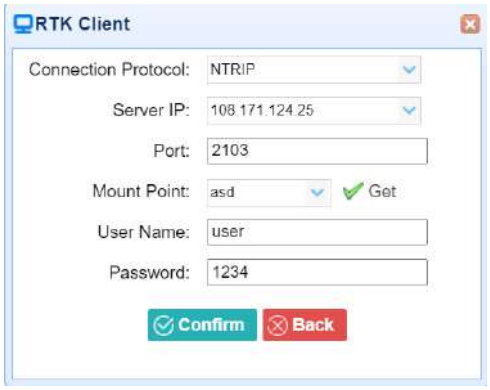
In this submenu, users can configure 6 types of input and output settings.

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 and APIS_ROVER → configure the related parameters → click 

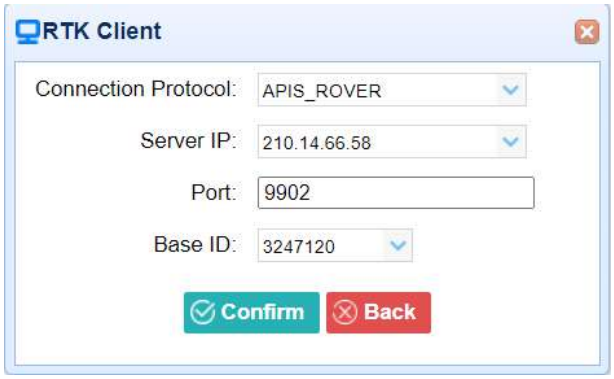
to log on CORS or APIS.
   - Connection Protocol: NTRIP
   -
   - Connection Protocol: APIS_BASE



   -



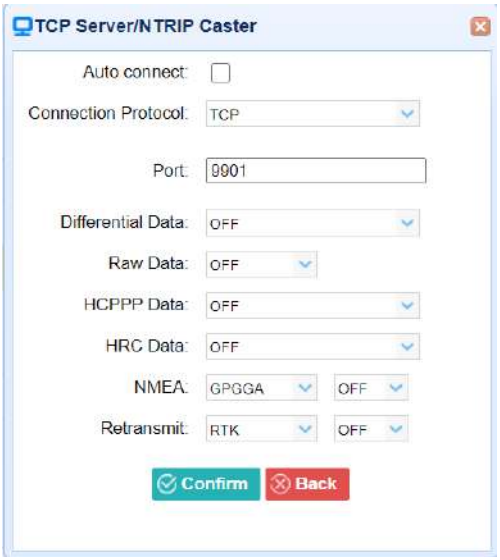
- Connection Protocol: APIS_ROVER



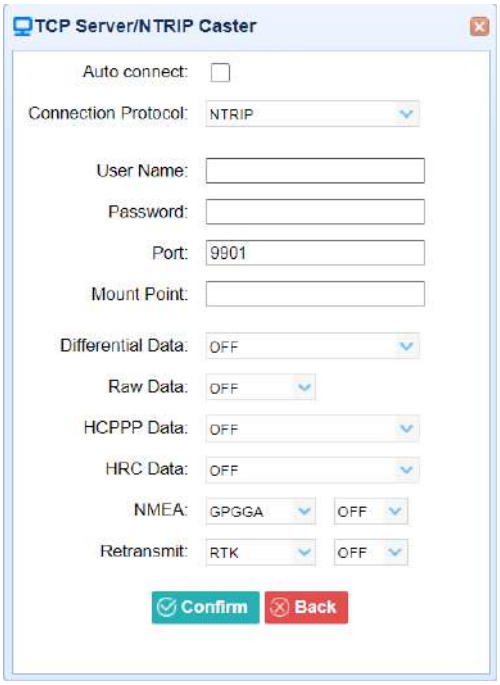
2. TCP/UDP Client
   Tap the **Connect** button to the right of required TCP/UDP Client → the *IO Settings* screen will appear → select the connection protocol between TCP and UDP → enter the IP and Port of the target server → configure messages that you want to output to the target server → click Confirm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

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.

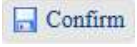
   - Connection Protocol: NTRIP



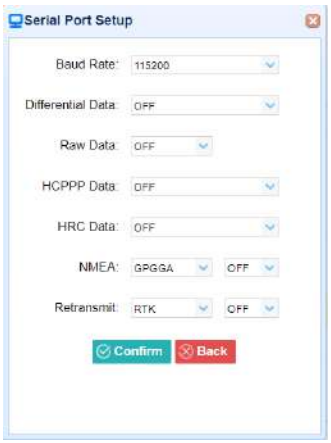
- Connection Protocol: TCP



4. Serial Port

   Tap the **Settings** button to the right of Serial Port → the *Serial Port Setup* screen will appear → select Baud Rate used to transmit data → configure the messages that you want to output through the serial port → click 

to save the settings and start to transmit.

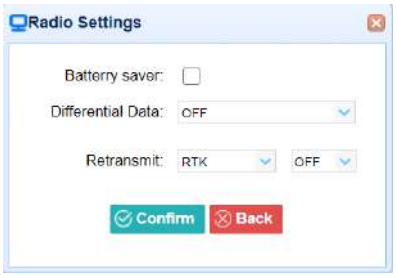


5. Bluetooth
   Tap the **Settings** button to the right of Bluetooth → the *Bluetooth Set* screen will appear → configure the messages that you want to transmit through Bluetooth → click 

to save the settings and start to transmit.

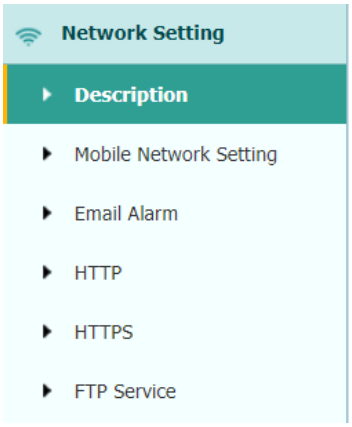
6. Radio
   Tap the **Settings** button to the right of Radio → the *Radio Settings* screen will appear → select the format of differential data that you want to transmit through radio from the dropdown list → click 

to save the settings and start to transmit.



5.6 Network Setting menu

Use this menu to view network information, configure the receiver's mobile network, set email alert for specific situation, configure HTTP or HTTPS port, and the user name and password of internal FTP site:



5.6.1 Description submenu

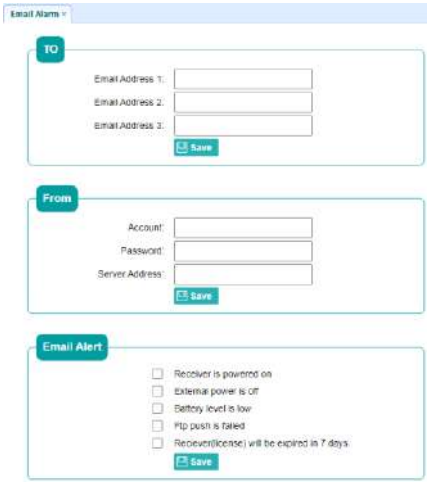
Use this submenu to check the information of network setting.

5.6.2 Mobile network setting submenu

Use this submenu to configure GPRS model, network module and modify dialing status.

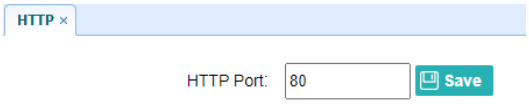
5.6.3 Email alarm submenu

Use this submenu to choose which situation of receiver will be alerted and input the email address.



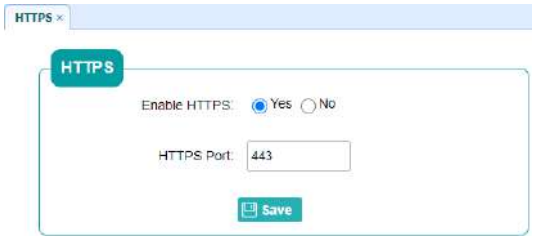
5.6.4 HTTP submenu

Use this submenu to configure HTTP port.



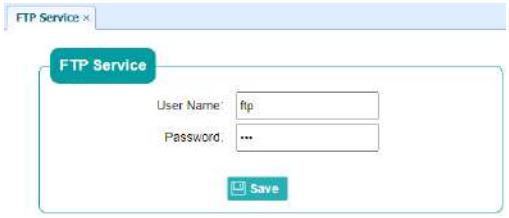
5.6.5 HTTPS submenu

Use this submenu to configure HTTPS port.



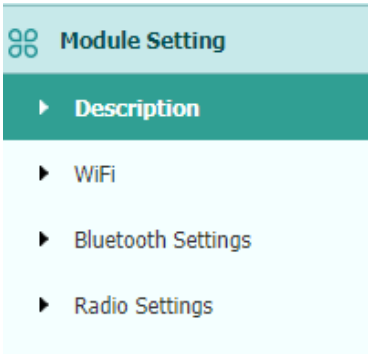
5.6.6 FTP service submenu

Use this submenu to configure the user name and password of internal FTP site.



5.7 Module setting menu

Use this menu to check module information, configure WiFi, bluetooth, radio related settings, and turn on/off static voice of buzzer:

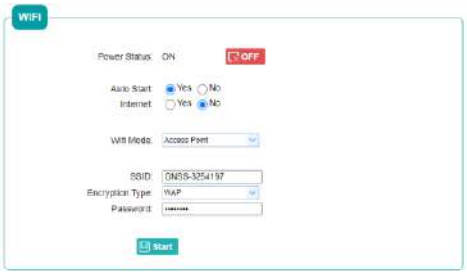


5.7.1 Description submenu

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

5.7.2 WiFi submenu

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



5.7.3 Bluetooth settings submenu

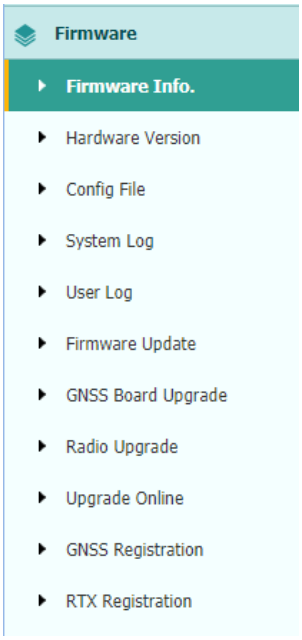
Use this submenu to turn on/off bluetooth function and modify PIN number.

5.7.4 Radio settings submenu

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

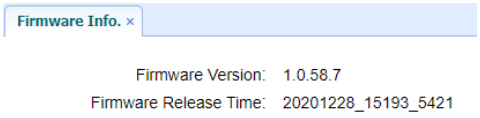
5.8 Firmware menu

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:



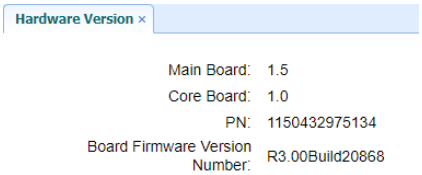
5.8.1 Firmware Info submenu

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



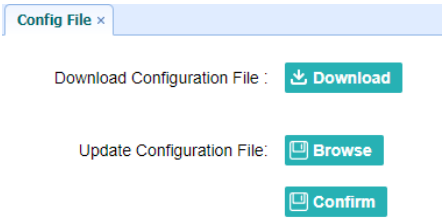
5.8.2 Hardware Version

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



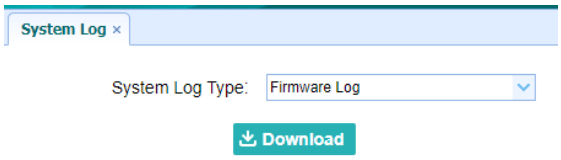
5.8.3 Config File

Use this submenu to update Configuration File.

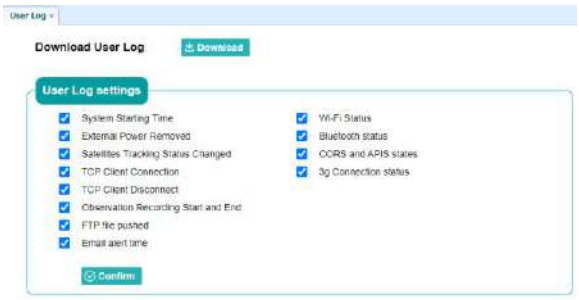


5.8.4 System Log Download submenu

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

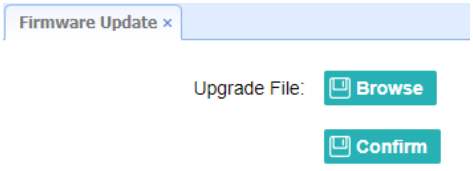


5.8.5 User Log



5.8.6 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 is finished, or damage will be caused to the receiver.

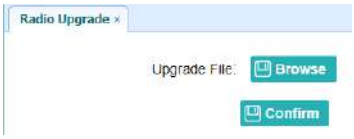
- The receiver will restart after the firmware upgrading is done, so users need to reconnect the receiver with your computer via Wi-Fi, and then log-in the receiver through a web browser to continue the configuration.

5.8.7 GNSS Board Upgrade

Use this submenu to upgrade GNSS Board.

5.8.8 Radio Upgrade

Use this submenu to browse upgrade file and upgrade radio.



5.8.9 Upgrade Online

Use this submenu to input Server Address and upgrade online.

5.8.10 GNSS Registration submenu

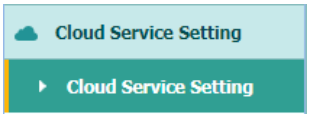
Use this submenu to register the receiver. Paste or enter the registration code to the *Registration Code* field → tap **Registration** button to complete the registration.

5.8.11 RTX Registration submenu

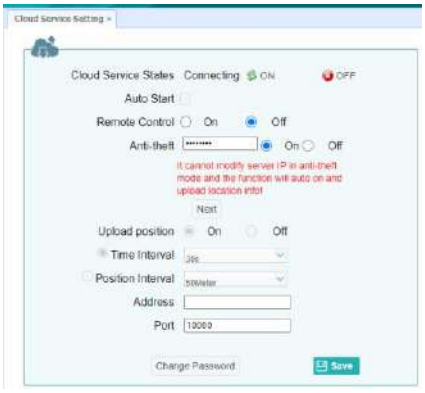
This submenu is reserved.

5.9 Cloud Service Setting menu

5.9.1 Cloud Service Setting submenu

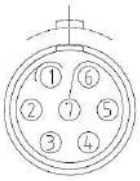


Use this submenu to turn on or turn off Cloud Service, Auto Start, Remote Control and configure other settings .



Communication Ports Definition

EFIX F4 Receiver IO Port (7-pin LEMO Port) Definition



PIN	FUNCTION
1	Ground (-)
2	Ground (-)
3	RS232-TX (Output)
4	PPS
5	Not Used
6	VIN
7	RS232-RX (Input)

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