

# **NET660 User Manual**



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## I. NET660

The front panel of the NET660 receiver includes an OLED screen and 8 buttons.









**Figure 1- 1 Front panel**

After starting the NET660 receiver, The main interface displays the receiver information, including the machine number and receiver firmware version. Press the arrow keys to view the current NET660 receiver positioning status, positioning coordinates, network status (including wired network and WIFI), and network configuration.

The following table lists the relevant information of each button function of NET660.

**Table 1- 1 Key Functions**

Button	Name	Function
--------	------	----------

Button	Name	Function
	Power Button	1. When the device is powered off, short press to turn on the receiver. 2. When the device is powered on, long press for 3 seconds to enter the shutdown procedure and shut down the device.
	Cancel	Short press to return to the tab bar
	Directional Move	1. Used to switch between different display interfaces 2. Make parameter selection settings
	Enter	Confirm selection
	SIM card slot	Access SIM card
	Type-c interface	Connect the computer through this interface to power the receiver



**Figure 1- 2 Communication**

The NET660 receiver provides a variety of communication interfaces for users to use in different application scenarios. The functions of each communication interface are as follows:

**Table 1- 2 Communication Interface Description**

Serial	Name	Function
1	PWR	receiver power supply interface, two-core head, receiver power supply interface, 9~36V (Typ12V)
2	COM	Five-core head, RS232 interface, Can output NMEA data
3	GND	Grounding port, Provides a potential reference point
4	SIM	SIM card slot
5	GNSS1/2	GNSS external receiving antenna interface , 1 : position 2 : Directional
6	EXT	External clock input
7	LTE	4G antenna interface
8	WIFI	WIFI antenna interface
9	VENT	Ventilation, exhaust
10	PPS	Pulse Per Second output (TTL3.3V)
11	RJ45	Adaptive 10/100M Ethernet interface

The dimension drawing of NET660 main unit is shown in the following figure:



**Figure 1-3 Structural dimension drawing/installation**

## II. Basic Operation

## 2.1 Boot

The external 12V or -48V power supply will automatically turn on when the power is off.

If the built-in battery is used for power supply without external power supply, press the power button on the front panel to turn it on.

After booting, the LCD will display an animation, and then start to start, and the internal software and hardware will be initialized. At this time, the main menu of the receiver's OLED LCD screen is displayed as follows content:







Figure 2- 1 Boot

## 2.2 Shutdown

Unplug the external power supply, press and hold the power button, wait for the progress bar on the LCD to finish, release the power button, and then enter the shutdown process, wait for the LCD to turn off and the receiver shuts down.

## 2.3 Keys

Press the left and right direction buttons to view the receiver information, positioning status, positioning coordinates, network status, network configuration. The following is an introduction to the interface indicator lights.

Icon	Illustrate
	Bluetooth Light
	Satellite lights
	4G signal light
	Power indicator

### Receiver information page:

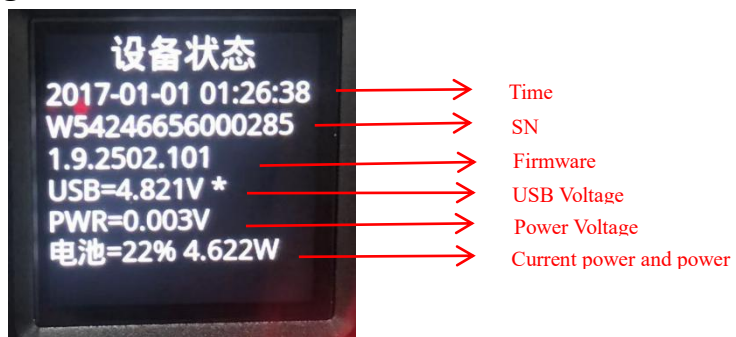


Figure 2-2 Info

### Receiver GNSS status:



Figure 2- 3 GNSS

### The current positioning coordinates of the receiver:

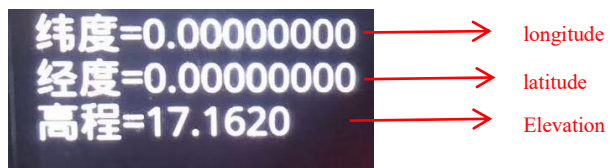


Figure 2- 4 Coordinates



The current network state of the receiver:

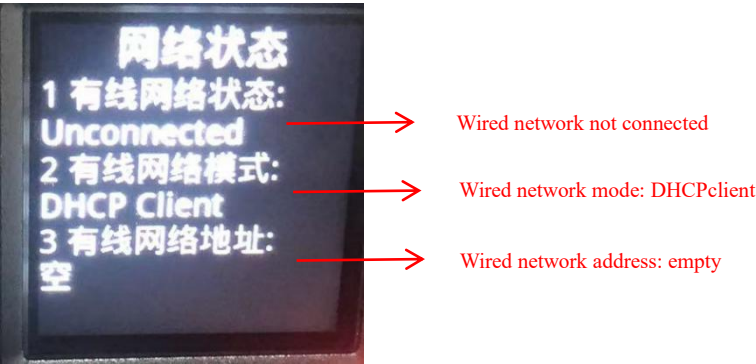


Figure 2-5 Running Status

Receiver network status:

In the network status interface, press the down arrow key to view

page	Remark	
		Wired network mask information Wired network gateway Wired network DNS WIFI network role
		WiFi network name WiFi network status Network mode WiFi network address
		WIFI network mask WIFI network gateway WIFI network DNS WIFI network start address WIFI network end address

Network configuration page:

The receiver provides the function of key operation to configure network parameters. Press the left and right arrow keys to switch to the network configuration page, press the OK key to enter the configuration, and press ESC at any time to cancel the configuration. The configuration will only be set into the receiver after all settings are completed.

page	Remark
 <p>网络配置 无 静态 DHCP客户端 DHCP服务端 有线网络模式</p>	<p>There are four network configuration modes: None, Static, DHCP Client, DHCP Server</p>
 <p>网络配置 无 静态 DHCP客户端 DHCP服务端 有线网络模式</p>	<p>Static address mode Static IP address setting: Press the up and down keys to select a number, and the left and right keys to switch positions. Configure four options: Wired Network Address, Network Mask, Wired Network Gateway, Wired Network DNS</p> <div data-bbox="690 667 998 989">     </div>
 <p>网络配置 无 静态 DHCP客户端 DHCP服务端 有线网络模式</p>	<p>The DHCP client can be configured successfully by simply clicking OK</p>
 <p>网络配置 静态 DHCP客户端 DHCP服务端 有线网络模式</p>	<p>Compared with the DHCP client, the DHCP server also needs to configure the wired network start and end addresses</p> <div data-bbox="706 1329 993 1787">       </div>

**Notice:**

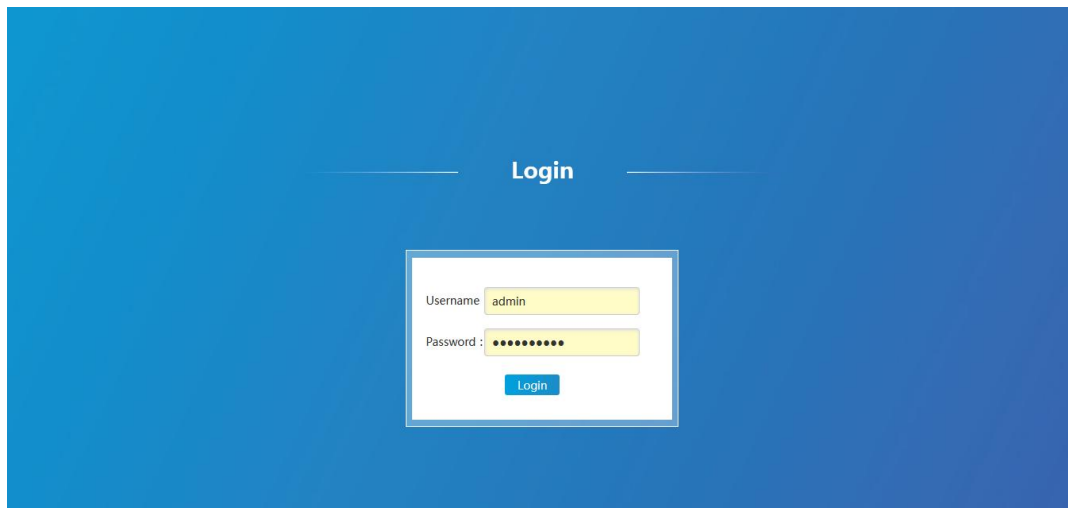
- 1) The receiver defaults to rover mode, with ntripclient as the source of differential data;
- 2) Default text output GPGGA, differential output RTCM33\_MSM4, raw data output RANGEB, frequency is 1Hz;
- 3) The wired network is enabled by default, and the wired network is in DHCP client mode, and the WiFi network and mobile network are disabled;
- 4) Data is not stored by default.

## 2.4 Login

Connect the receiver to the switch or router through a straight-through cable, and then set and view the IP of the NET660 receiver through the buttons on the panel. Keep the PC/laptop accessing the receiver in the same local area network as the receiver, and enter NET660 on the browser. The IP address displayed by the receiver OLED is used to access the NET660 receiver.

Enter the username and password in the dialog box (the default username and password are **admin:~abc123456**)

**Note: In order to enhance security, the maximum timeout time for the client browser to access the receiver is 10 minutes. If the browser does not operate for more than 10 minutes, it will automatically log out and re-enter the login interface.**



**Figure 2-7 Login**

After successful login verification, you enter the web interface of NET660. The home page is the "Simple UI" page for the host, which is displayed as follows:

Device Status		
Uptime	01:28:29	
Battery Charge	Full 8.4V 99%	
Extend Voltage	11.7 V	
Temperature	37.7 °C	
Ethernet	Connected	192.168.17.121
WiFi	AP Up	Z33136662002972
CPU	5.3%	
RAM	20.0%	
Storage	0B/24.000000GB	
Exception	None	

GNSS Status		
Time	2025-01-02 10:13:02	
UTC	2025-01-02 02:13:02	
Position quality	RTK Floating PPP	

**Figure 2- 8 Simple UI Status**

Click on "Advanced UI" in the upper right corner to enter the complete host configuration page, as shown below:

Device Status		
Time	2025-01-02 10:13:47	
Uptime	01:29:14	
GNSS Quality	RTK Floating	
Battery Charge	Full 8.4V 99%	
Extend Voltage	11.7 V	
Temperature	37.7 °C	
Ethernet	Connected	192.168.17.121
WiFi	AP Up	Z33136662002972
CPU	5.6%	
RAM	20.0%	
Storage	0B/24.000000GB	
Exception	None	

**Figure 2- 9 Advance UI Status**

Note: The display effect of different browsers will be slightly different, it is recommended to use the Firefox browser

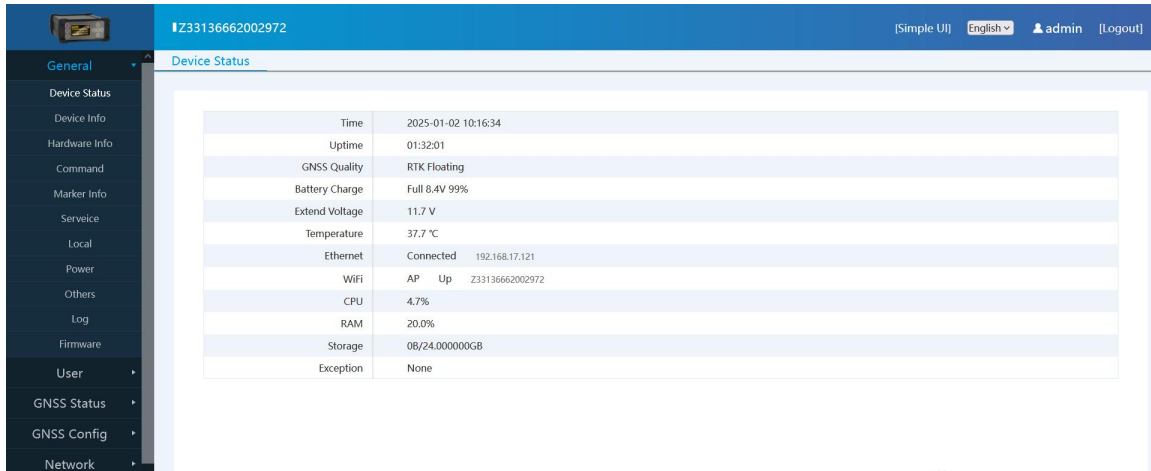
The web interface of the NET660 receiver is mainly divided into 7 parts, and each part is divided into multiple display information and function setting selection. The details will be introduced in the next chapters.

## III. WebUI Introduction

### 3.1 General

#### 3.1.1 Device Status

Provides the physical status of the receiver, such as Time, GNSS Quality, Temperature, Voltage, Battery Info, Ethernet, CPU, and Exception. As shown below:



Time	2025-01-02 10:16:34
Uptime	01:32:01
GNSS Quality	RTK Floating
Battery Charge	Full 8.4V 99%
Extend Voltage	11.7 V
Temperature	37.7 °C
Ethernet	Connected 192.168.17.121
WiFi	AP Up Z33136662002972
CPU	4.7%
RAM	20.0%
Storage	0B/24.000000GB
Exception	None

Figure 3- 1 Device Status

#### 3.1.2 Device Info

Provides the basic information of the receiver, such as SN, Expired Date, Feature Function, firmware and other information. As shown below:



SN	Z33136662002972
PN	20190812
HID	G3H1
Brand	N
Model	M66UFH
Product Date	2023-03-29
Board1 SN	6200000297
Board2 SN	00.09.0000156.01.00
Register Code	26D50FF3AD81E63C
Expired Date	2099-12-31
Functionality	0x0000
Feature Code	2eaHPkTRAAQONIFzr3Dx6s=
Feature Function	rtcm;ntp;storage;binary;rtcm;fixlink;
Feature Region	53;
Hardware	20190812
Firmware	371.2411.1871

Figure 3- 2 Device Info

#### 3.1.3 Hardware Info

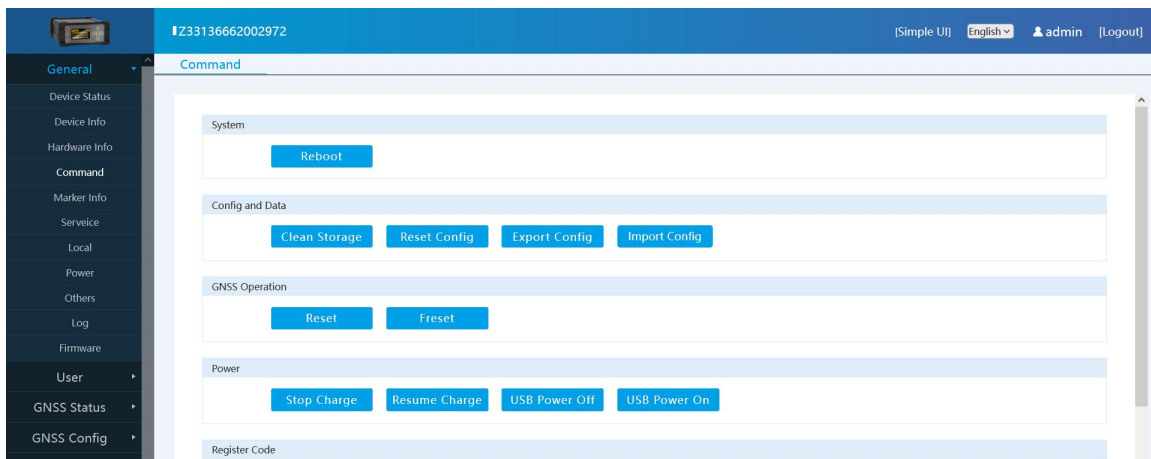
Provides the receiver hardware information, such as receiver CPU model, RAM capacity, Flash capacity, positioning board model. As shown below:

Hardware Info	
CPU Model	LMX6UL
CPU Frequency	528MHz
RAM Size	256MB
Flash Size	32GB
Mcu Model	STM32F103
Mcu Frequency	72MHz
GNSS Model	UM982
GNSS SN	LR23A4224305987
GNSS Hardware	Z310415000012
GNSS Firmware	R4.10Build13495
GNSS FPGA	
GNSS Auth	HRPT00-S10C-P
SKF	NONE

**Figure 3- 3 Hardware Info**

### 3.1.4 Command

Provides the System, Config, Operation, Power, Feature Code and Register Code of the receiver commands. As shown below:



**Figure 3- 4 Command**

### 3.1.5 Marker Info

Provides Measure Info such as the Marker Name, Marker Number, Marker Type and Antenna Info such as the SN, SetupID. As shown below:

The screenshot shows the 'Marker Info' configuration page. The left sidebar contains a menu with options: General, Device Status, Device Info, Hardware Info, Command, Marker Info (selected), Service, Local, Power, Others, Log, Firmware, User, GNSS Status, GNSS Config, and Network. The top header displays the device ID 'Z33136662002972', a language dropdown set to 'English', and user information 'admin' with a 'Logout' link. The main content area is titled 'Marker Info' and contains two sections: 'Measure Info' and 'Antenna Info'. The 'Measure Info' section includes fields for 'Marker Name' (Z33136662002972), 'Marker Number' (2972), 'Marker Type' (Earth-fixed high-precision monumen), 'Observer', 'Agency', and 'Remark'. The 'Antenna Info' section includes fields for 'SN' (A0001) and 'SetupID' (1).

**Figure 3- 5 Marker Info**

### 3.1.6 Service

Provides service configuration options, configure HTTP, HTTPS, FTP and other related ports. As shown below:

The screenshot shows the 'Service' configuration page. The left sidebar is the same as in Figure 3-5, with 'Service' selected. The top header is also the same. The main content area is titled 'Service' and contains three sections: 'HTTP', 'HTTPS', and 'SSH'. The 'HTTP' section has 'State' (Enable) and 'Port' (80). The 'HTTPS' section has 'State' (Enable), 'Port' (443), and 'Verify Peer' (Disable). The 'SSH' section has 'State' (Disable).

**Figure 3- 6 Service**

### 3.1.7 Local

Provides time zone settings and language settings of the receiver. As shown below:

The screenshot shows the 'Local settings' page. The left sidebar contains a menu with items: General, Device Status, Device Info, Hardware Info, Command, Marker Info, Service, Local, Power, Others, Log, Firmware, User, GNSS Status, GNSS Config, and Network. The 'Local settings' page has three main sections: 'Time Zone' with a dropdown set to 'UTC+08:00', 'Language' with a dropdown set to 'English', and 'Authentication' with a password field. An 'Apply' button is located at the bottom right of the settings area.

**Figure 3- 7 Local**

### 3.1.8 Power

Displaying power configuration options, this page is for allocating the host power restart function.

The screenshot shows the 'Power' page. The left sidebar is the same as in Figure 3-7. The 'Power' page has four main sections: 'Auto Reboot' with a 'Mode' dropdown set to 'Disable', 'PING Timeout Reboot' with a 'Mode' dropdown set to 'Disable', 'External Power' with 'Auto Boot' set to 'Enable' (with a note 'Boot when external power on') and 'Auto Shutdown' set to 'Disable' (with a note 'Shutdown after external power off'), and 'Authentication' with a password field. An 'Apply' button is at the bottom right.

**Figure 3- 8 Power**

### 3.1.9 Others

Provides other configuration options, backup config file, Tune Alarm, Auto Shutdown, Screen, etc. As shown below:

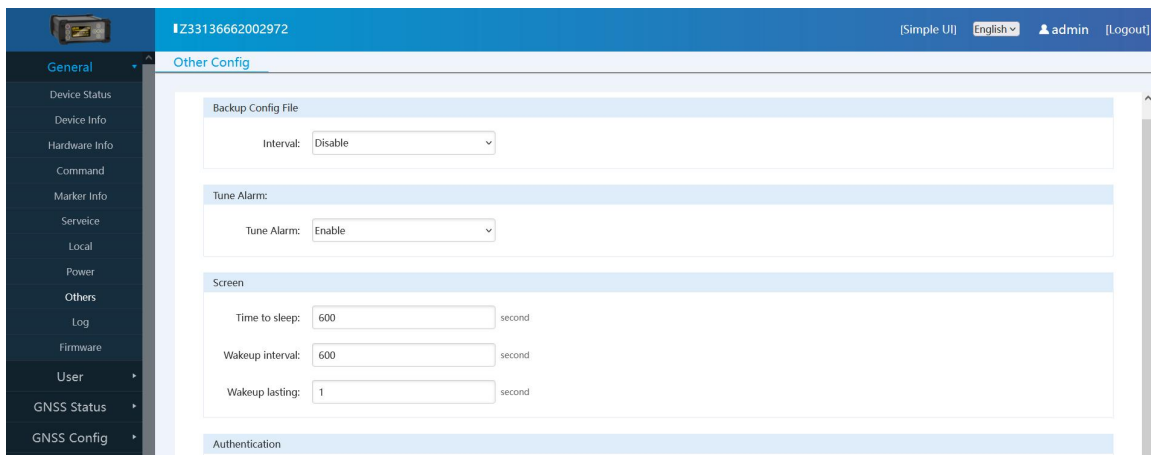


Figure 3- 9 Others

### 3.1.10 Log

Each time the receiver is powered on, a system log file will be generated to record the various states of the receiver, so that it is convenient to investigate the cause of the receiver exception when an exception occurs. As shown below:

The screenshot displays the 'Log' page of the device management interface. The left sidebar is the same as in Figure 3-9. The main content area is titled 'Log' and contains a table of log files. The table has four columns: File Name, Size, Time Modified, and Operation. Each row represents a log file and includes a 'Download' link in the Operation column.

File Name	Size	Time Modified	Operation
Z33136662002972-0085.zlog	64.07kB	2025-01-02 10:14:43	<a href="#">Download</a>
Z33136662002972-0084.zlog	437.82kB	2025-01-02 08:44:09	<a href="#">Download</a>
Z33136662002972-0083.zlog	39.87kB	2024-08-07 17:28:01	<a href="#">Download</a>
Z33136662002972-0082.zlog	73.30kB	2024-08-07 17:27:10	<a href="#">Download</a>
Z33136662002972-0081.zlog	67.26kB	2024-08-07 17:16:11	<a href="#">Download</a>
Z33136662002972-0080.zlog	36.68kB	2024-07-16 19:32:15	<a href="#">Download</a>
Z33136662002972-0079.zlog	42.29kB	2024-07-16 19:31:56	<a href="#">Download</a>
Z33136662002972-0078.zlog	42.50kB	2024-07-16 19:31:21	<a href="#">Download</a>
Z33136662002972-0077.zlog	74.57kB	2024-07-16 19:28:11	<a href="#">Download</a>
Z33136662002972-0076.zlog	605.04kB	2024-07-16 15:58:20	<a href="#">Download</a>
Z33136662002972-0075.zlog	73.07kB	2024-07-14 02:37:04	<a href="#">Download</a>
Z33136662002972-0074.zlog	51.54kB	2024-07-14 01:57:19	<a href="#">Download</a>
Z33136662002972-0073.zlog	304.35kB	2024-07-14 01:50:20	<a href="#">Download</a>
Z33136662002972-0072.zlog	40.75kB	2024-07-12 14:46:02	<a href="#">Download</a>
Z33136662002972-0071.zlog	46.50kB	2024-07-12 14:25:36	<a href="#">Download</a>

Figure 3- 10 Log

### 3.1.11 Firmware

Provides the current receiver's system, kernel, receiver firmware, positioning board firmware and other version information, as well as version upgrade operations. As shown below:

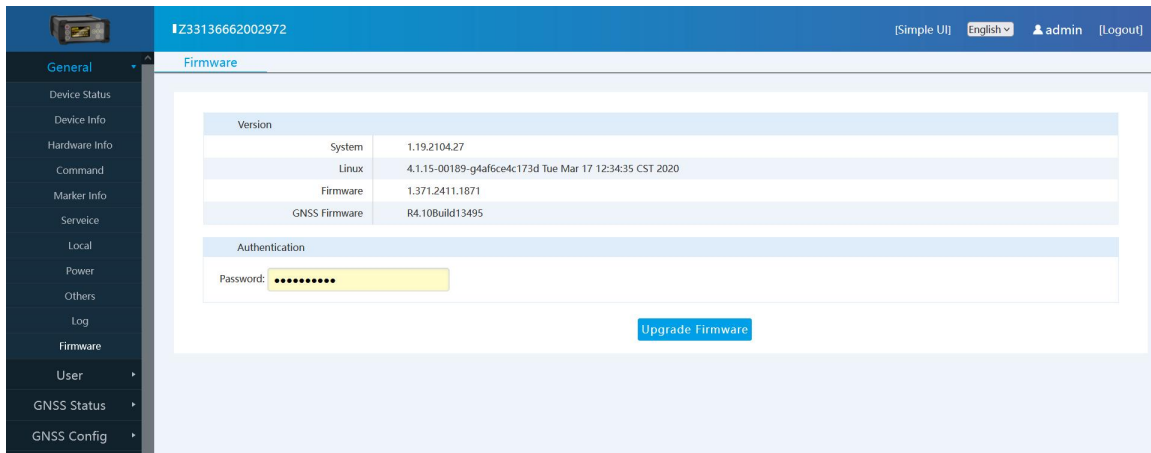


Figure 3- 11 Firmware

## 3.2 User

### 3.2.1 List User

Provides the current receiver user list, admin is the administrator, has the highest authority, and can add or decrease other users, configure password settings and permissions. When creating a new user, the user has no password by default, and can only be used after setting a password. As shown below:

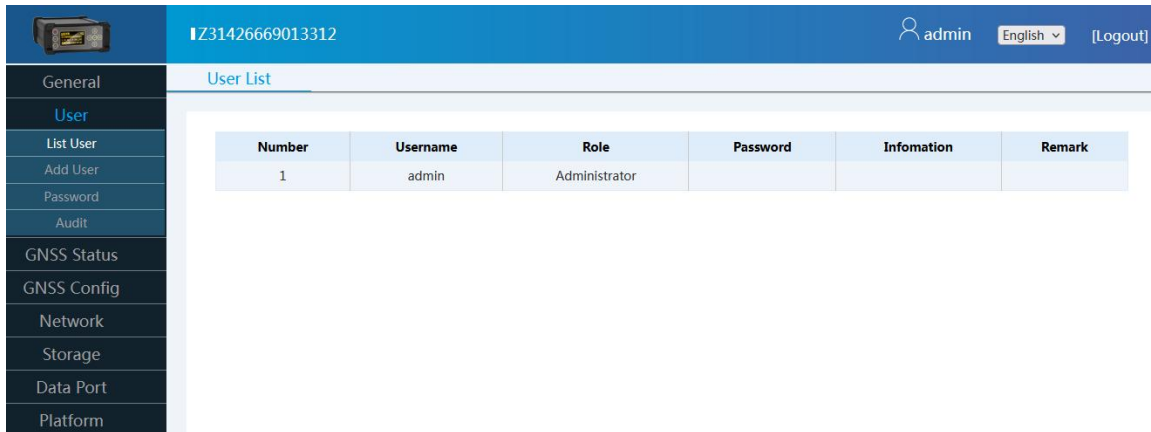


Figure 3- 12 List User

### 3.2.2 Add User

Set new user information, role permissions and add operations. As shown below:

Figure 3- 13 Add User


### 3.2.3 Password

It is used to modify the password of the currently logged-in user. The current user password needs to be filled in at the authentication place. As shown below:

Figure 3-14 Password

### 3.2.4 Audit

Users with audit privileges can query audit records. As shown below:

 <span>IZ31426669013312</span> <span>admin</span> <span>English</span> <span>[Logout]</span>	
General	Audit
User	
List User	
Add User	
Password	
Audit	
GNSS Status	
GNSS Config	
Network	
Storage	
Data Port	
Platform	

Time Begin
2020-08-08 16:50:15

Time End
2022-08-09 16:50:15
Query


	Time	Source	User	Type	Event	Result
1	2021-10-19 08:46:13.336		admin	用户登录	注销	成功
2	2021-10-19 08:46:14.608	WEB,10.10.11.6	admin	用户登录	登入	成功
3	2021-10-19 08:46:24.463	WEB,10.10.11.6	admin	参数配置	写入配置	成功
4	2021-10-19 08:46:45.566	WEB,10.10.11.6	admin	参数配置	写入配置	成功
5	2021-10-19 08:46:54.410	WEB,10.10.11.6	admin	参数配置	写入配置	成功
6	2021-10-19 08:47:01.783	WEB,10.10.11.6	admin	参数配置	写入配置	成功
7	2021-10-19 08:47:06.708	WEB,10.10.11.6	admin	参数配置	写入配置	成功
8	2021-10-19 08:47:12.289	WEB,10.10.11.6	admin	参数配置	写入配置	成功

Figure 3- 15 Audit

## 3.3 GNSS Status

### 3.3.1 Status

Used to display the Time, UTC, Quality, Used/Tracked, Differential Age, PDOP, Latitude, Longitude, and Height of the receiver. As shown below:

 <span>IZ31426669013312</span> <span>admin</span> <span>English</span> <span>[Logout]</span>	
General	GNSS Status
User	
GNSS Status	
Status	
C/No	
Skyplot	
Data Stream	
GNSS Config	
Network	
Storage	
Data Port	
Platform	

Time	2022-08-09 16:53:49	
UTC	2022-08-09 08:53:49	
Position quality	Fixed Position FIXEDPOS	
Used/Tracked	28/44	
Differential Age	0	
PDOP	1.36	
HDOP	0.67	
Point Latitude	23.16498547 °	$\sigma = 0.000$ m
Point Longitude	113.43141155 °	$\sigma = 0.000$ m
Point Height	-6.4192+31.3493+0.0000=24.9301 m $\sigma = 0.000$ m	
Phase ECEF	-2333005.608 , 5383158.924 , 2493537.695 m	

Figure 3- 16 Status

### 3.3.2 C/N<sub>0</sub>

There are two display modes: table and chart. Click the corresponding satellite system icon to view the satellite signal-to-noise ratio information of the system. As shown below:

Note: The number of carrier-to-noise ratio frequency points is related to the receiving environment. For example, the number of frequency points displayed indoors and outdoors will be different.

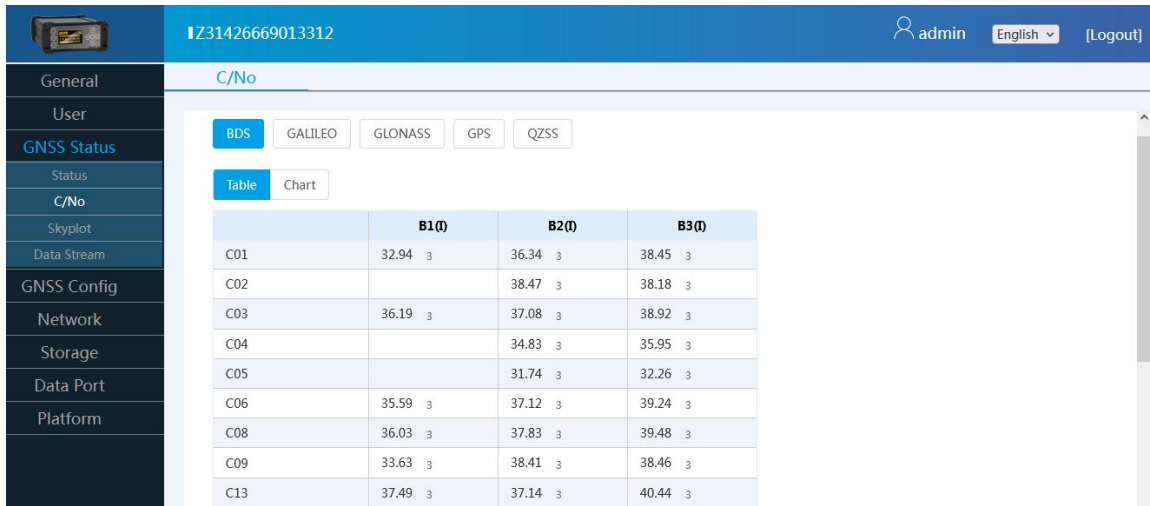


Figure 3- 17 Table

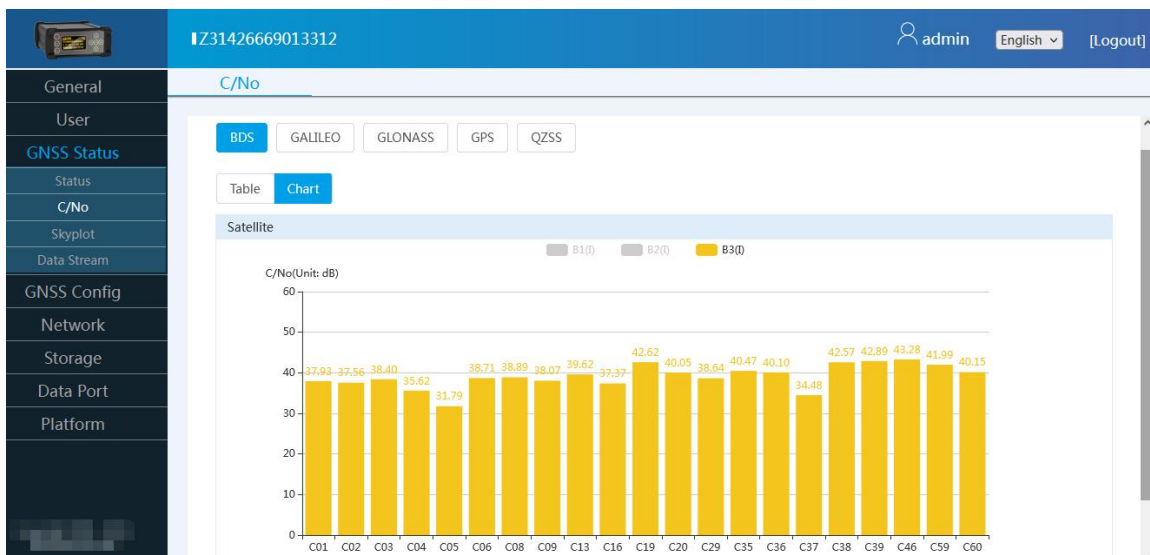


Figure 3- 18 Chart

### 3.3.3 Skyplot

Display the distribution of the satellites tracked by the current receiver, check [Trace] to draw the running track diagram of the satellites tracked by the receiver in the monitoring time period. As shown below:

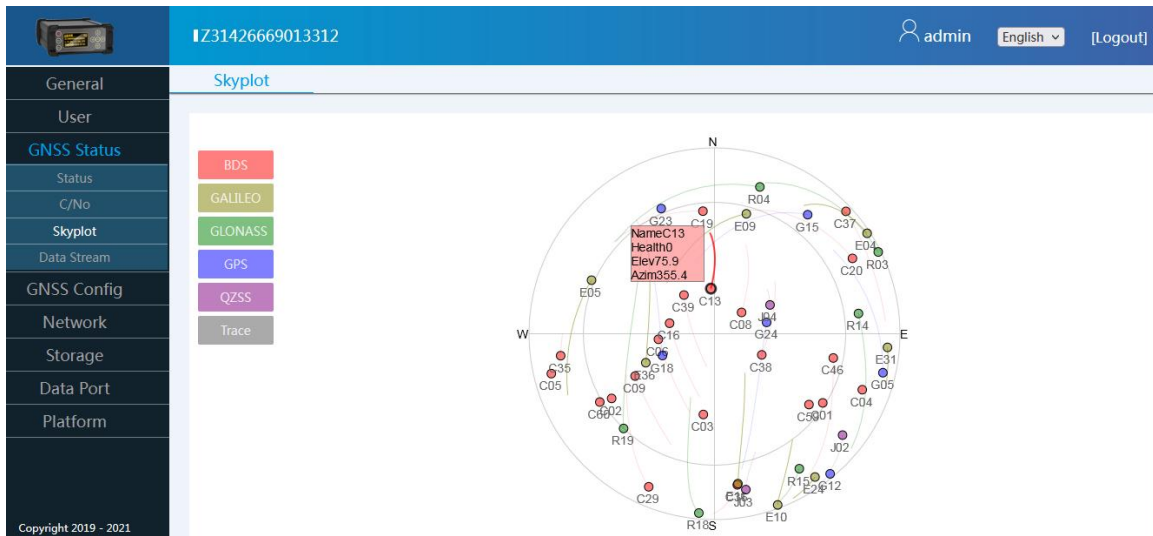


Figure 3- 19 Skyplot

### 3.3.4 Data Stream

Select the data source in the data drop-down menu, you can directly view the real-time data of the corresponding data source on the web side. As shown below:

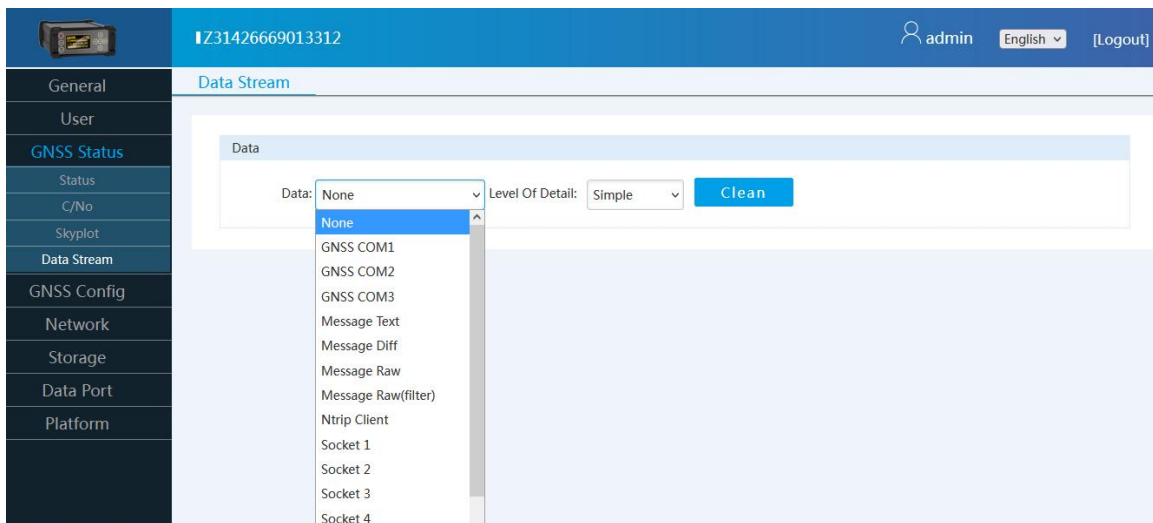


Figure 3- 20 Data Stream

## 3.4 GNSS Config

### 3.4.1 GNSS Config

It is used to configure the working mode of the receiver (base station, mobile station), whether to supply power to the antenna and the selection of the level surface.

Check [**Get Coordinate**] to obtain the real-time coordinate value of the current receiver after the successful positioning.

As a rover mode, you can select [**Differential Source**]. As shown below:

The screenshot shows the 'GNSS Config' page in a web application. The top header includes a device icon, the ID 'IZ31426669013312', a user profile 'admin', a language dropdown set to 'English', and a '[Logout]' button. The left sidebar lists various configuration categories: General, User, GNSS Status, GNSS Config (highlighted), GNSS Config, System, PPS, Message Text, Message Diff, Message Raw, Others, Network, Storage, Data Port, and Platform. The main content area is titled 'GNSS Mode' and contains the following settings:

- GNSS Mode :** Rover
- Differential Source:** Ntrip Client (with a dropdown menu open showing options: None, Ntrip Client, Socket 1, Socket 2, Socket 3, Socket 4, Socket 5, Bluetooth, Serial COM1, Serial COM2)
- RTK Diff Age Max:** Ntrip Client s [5 ~ 60]
- PSR Diff Age Max:** Socket 2 s [5 ~ 60]
- Antenna** section:
  - Model:** (empty dropdown)
  - Height:** (empty input field) m
- Measure Type:** Phase

**Figure 3- 21 Rover Mode**

When used as the base station, auto coordinate start and repeat coordinate start can be selected.

When auto coordinates are started, the receiver automatically matches a base station start coordinate according to the current single-point positioning data to start the base station. As shown below:

The screenshot shows the 'GNSS Config' page with the 'GNSS Mode' section expanded. The settings are as follows:

- GNSS Mode :** Base
- Base Mode :** Auto
- Antenna** section:
  - Model:** NONE
  - Height:** 0 m
- Measure Type:** Phase

**Figure 3- 22 Base Station Mode - Auto**

When starting with repeat coordinates, you can manually input the coordinates of the location of the antenna to start the base station, or you can check " **Get current coordinates**" to obtain the current single point coordinates of the receiver to start the base station. As shown below:

The screenshot shows the 'GNSS Config' page with the 'GNSS Mode' set to 'Base' and 'Base Mode' set to 'Repeat'. The configuration fields are as follows:

Field	Value	Range
GNSS Mode	Base	
Base Mode	Repeat	
Latitude	23.16498547	* [-90 ~ 90]
Longitude	113.43141155	* [-180 ~ 180]
Height	24.9300	m [-1000 ~ 10000]

There is a checkbox labeled 'Get current coordinate' which is checked.

**Figure 3- 23 Base Station Mode - Repeat**

There are three ways to measure the antenna height: [Phase], [Bottom] and [Vertical]. As shown below:

The screenshot shows the 'Antenna' configuration page. The configuration fields are as follows:

Field	Value
Model	NONE
Height	0 m
Measure Type	Phase
Authentication	Phase
Password	*****

The 'Measure Type' dropdown menu is open, showing options: Phase, Bottom, and Vertical.

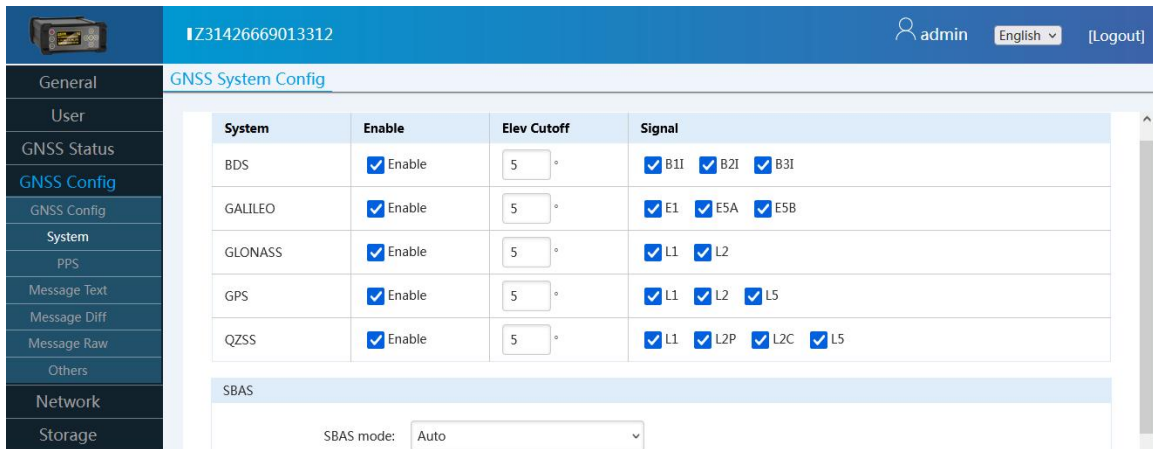
**Figure 3- 24 Base station mode - Antenna**

According to the command RTCM1006 in the requirement document, the "ah" (the antenna height is actually the bottom height) is the result of the conversion of the antenna information parameters filled in the "Positioning Configuration" page, and its value range is 0.0000-6.5535. If the converted value is not within this range, the page will prompt "parameter invalid" during application. The conversion methods for the three antenna height acquisition methods are as follows:

- 1) The conversion formula when the phase center height is selected: **Bottom height = Phase center height-H-HL1**
- 2) Conversion formula when selecting straight height: **Bottom height = Straight height - H**
- 3) The conversion formula when bottom height is selected: **Bottom height = Bottom height**

### 3.4.2 System

It is used for receiver satellite system selection, cut-off angle setting and frequency signal selection. The display is as follows: (Note: B1C/B2A of BDS is Beidou-3 system signal)



The screenshot shows the 'GNSS System Config' page. The left sidebar contains a menu with 'GNSS Config' selected. The main content area has a table for configuring GNSS systems. The table has four columns: System, Enable, Elev Cutoff, and Signal. The rows are BDS, GALILEO, GLONASS, GPS, and QZSS. Each row has checkboxes for enabling the system and a dropdown for the elevation cutoff. The Signal column shows the enabled signals for each system. Below the table is an 'SBAS' section with an 'SBAS mode' dropdown set to 'Auto'.

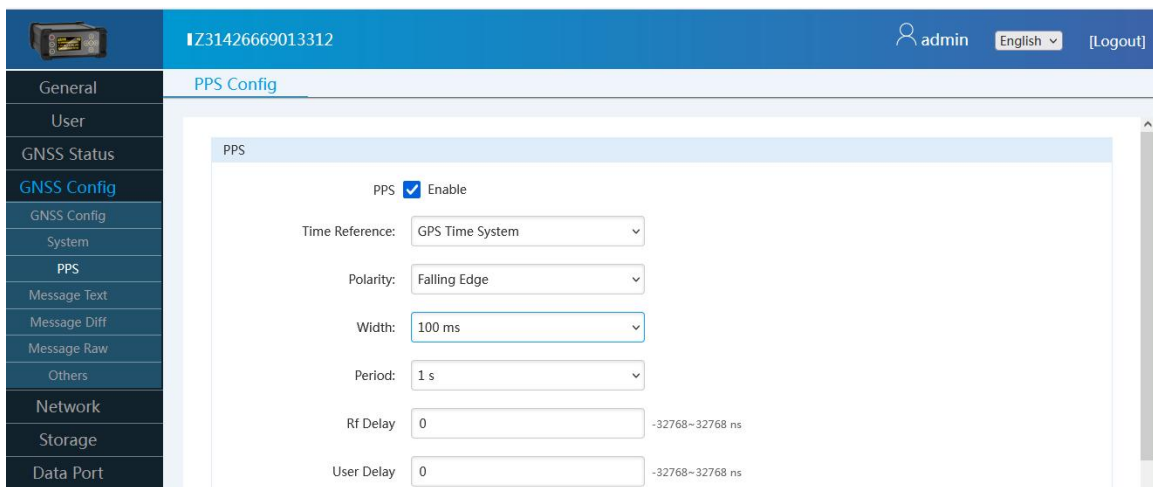
System	Enable	Elev Cutoff	Signal
BDS	<input checked="" type="checkbox"/> Enable	5 °	<input checked="" type="checkbox"/> B1I <input checked="" type="checkbox"/> B2I <input checked="" type="checkbox"/> B3I
GALILEO	<input checked="" type="checkbox"/> Enable	5 °	<input checked="" type="checkbox"/> E1 <input checked="" type="checkbox"/> E5A <input checked="" type="checkbox"/> E5B
GLONASS	<input checked="" type="checkbox"/> Enable	5 °	<input checked="" type="checkbox"/> L1 <input checked="" type="checkbox"/> L2
GPS	<input checked="" type="checkbox"/> Enable	5 °	<input checked="" type="checkbox"/> L1 <input checked="" type="checkbox"/> L2 <input checked="" type="checkbox"/> L5
QZSS	<input checked="" type="checkbox"/> Enable	5 °	<input checked="" type="checkbox"/> L1 <input checked="" type="checkbox"/> L2P <input checked="" type="checkbox"/> L2C <input checked="" type="checkbox"/> L5

SBAS mode: Auto

Figure 3- 25 System

### 3.4.3 PPS

Used to configure the working mode (polarity, pulse width and period) of the receiver PPS signal, as shown below:



The screenshot shows the 'PPS Config' page. The left sidebar contains a menu with 'PPS' selected. The main content area has a 'PPS' section with a checkbox for 'Enable' which is checked. Below this are several configuration options: 'Time Reference' (GPS Time System), 'Polarity' (Falling Edge), 'Width' (100 ms), 'Period' (1 s), 'Rf Delay' (0), and 'User Delay' (0). The Rf Delay and User Delay fields have a range of -32768 to 32768 ms.

PPS ☒ Enable

Time Reference: GPS Time System

Polarity: Falling Edge

Width: 100 ms

Period: 1 s

Rf Delay: 0 -32768~32768 ms

User Delay: 0 -32768~32768 ms

Figure 3- 26 PPS

### 3.4.4 Message Text

Used to configure the receiver text data output type and output rate, as shown below:

The screenshot shows the 'Message Text' configuration page. On the left is a sidebar with navigation options: General, User, GNSS Status, GNSS Config (selected), System, PPS, Message Text, Message Diff, Message Raw, Others, Network, Storage, Data Port, and Platform. The main content area is titled 'Message Text' and contains two panels: 'NMEA' and 'ASCII'. In the 'NMEA' panel, the 'GPGGA' setting has a dropdown menu open, showing options: 1 s, None (highlighted), 20 Hz, 10 Hz, 5 Hz, 2 Hz, 1 s, 2 s, 5 s, 10 s, 15 s, 20 s, 30 s, and 1 min. The 'ASCII' panel contains five dropdown menus: BESTPOSA, BESTVELA, EVENTALLA, REFSTATIONA, and TIMEA, all of which are currently set to 'None'.

Figure 3- 27 Message Text

### 3.4.5 Message Diff

It is used to configure the format of the receiver differential message, the observation message, the information message, the ephemeris message, the ID of the base station and the output frequency. As shown below:

The screenshot shows the 'Message Diff' configuration page. The sidebar is the same as in Figure 3-27, with 'Message Diff' now selected. The main content area is titled 'Message Diff' and contains a 'Diff' section. In this section, the 'Message Set' dropdown menu is open, showing options: None, CMR, RTD, RTCM23, RTCM24, RTCM30, RTCM32\_MSM4, RTCM32\_MSM5, RTCM32\_MSM6, RTCM32\_MSM7, RTCM33\_MSM4 (highlighted), RTCM33\_MSM5, RTCM33\_MSM6, and RTCM33\_MSM7. To the right of the dropdown, a note says 'Not config, may be changed after refresh the web page.' Below the dropdown is the 'Observation Message' section, which lists several RTCM messages and their corresponding observation types: RTCM1074 (GPS observation), RTCM1084 (GLONASS observation), RTCM1094 (GALILEO observation), RTCM1114 (QZSS observation), and RTCM1124 (BEIDOU observation). The 'Information Message' section is partially visible at the bottom.

Figure 3-28 Message Diff

### 3.4.6 Message Raw

It is used to configure the raw data output rate of the receiver, including observation data, ephemeris, ionospheric parameters, navigation messages, other messages, etc., and provides observation data filters. As shown below:

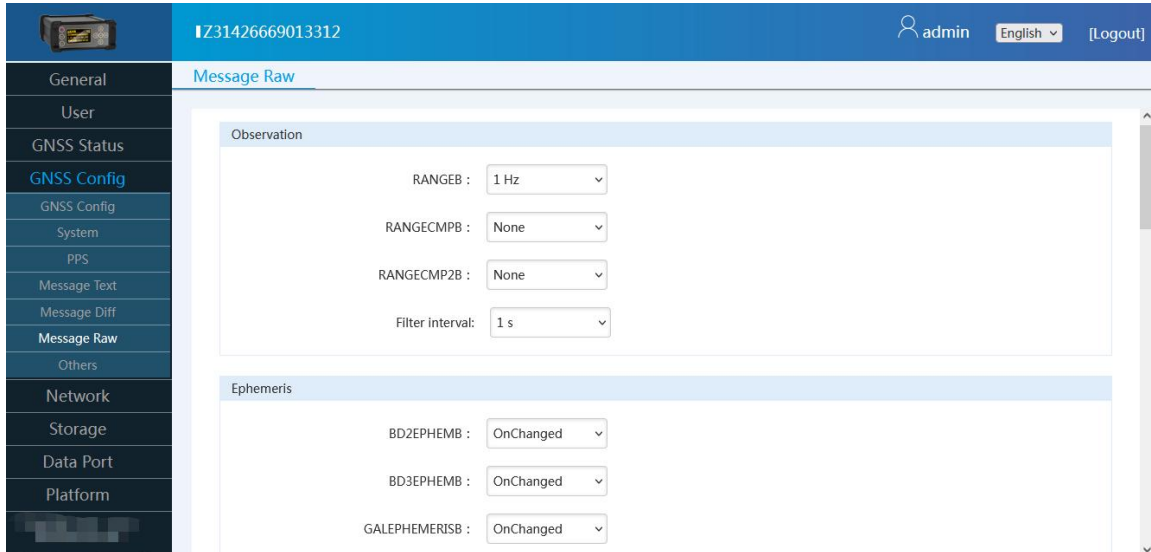


Figure 3-29 Message Raw

### 3.4.7 Others

It is used to select the level, whether to enable frequency marker input, event input, and send user-defined commands to the positioning board. As shown below:

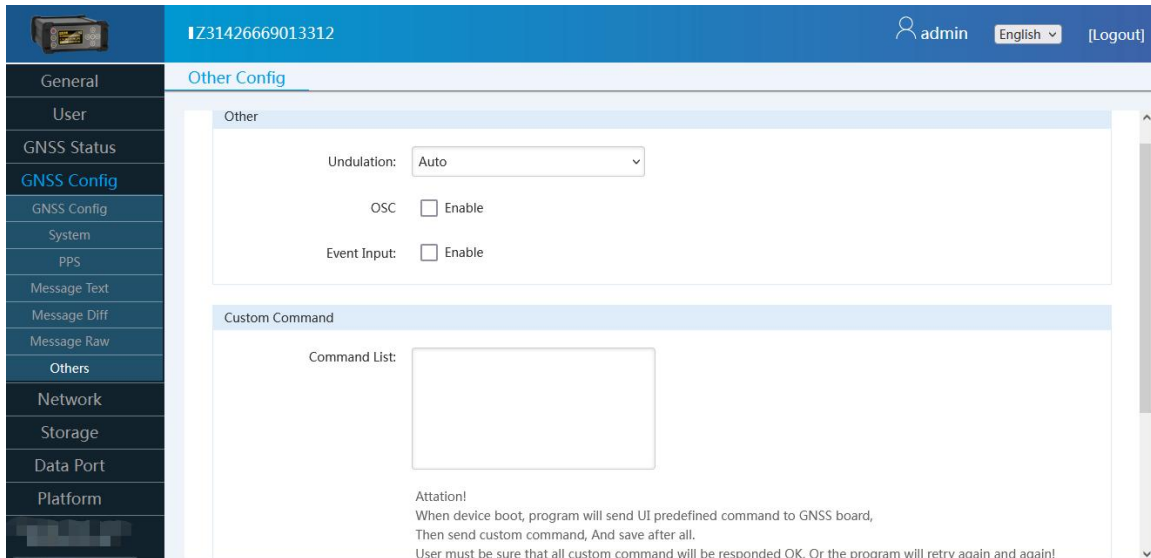


Figure 3- 30 Others

## 3.5 Network

### 3.5.1 Status

Displays the Ethernet, WiFi, and Mobile network ( **only the receiver that supports mobile network** ) enabling status of the current receiver. As shown below:



Z31426669013312		admin	English	[Logout]
General	Network Status			
User				
GNSS Status				
GNSS Config				
Network				
Status				
Ethernet				
WiFi				
Mobile				
Manual Route				
Auto Route				
Tool				
Storage				
Data Port				
Platform				

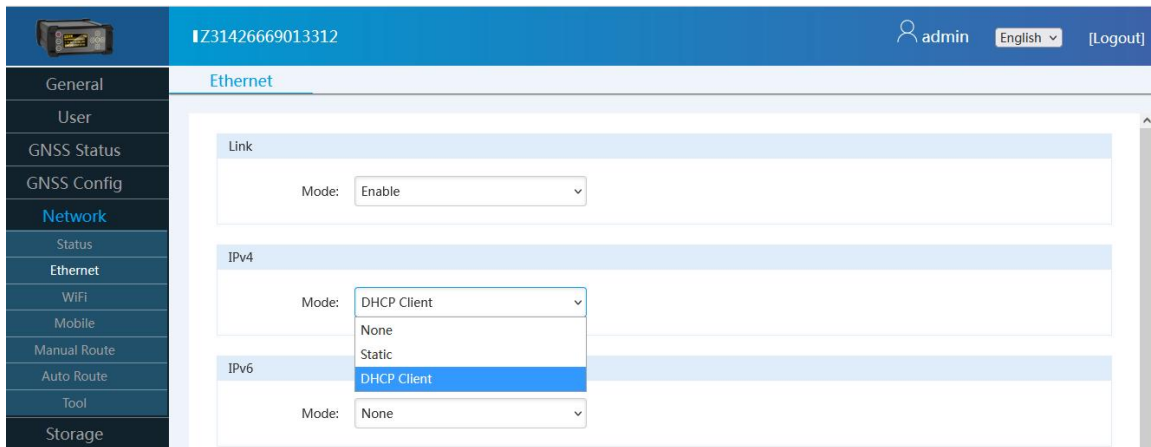
Ethernet	
State	Connected
Rx Flow	2M329k497B 6k844B/s
Tx Flow	602k482B 4k581B/s
Mode	DHCP Client
Address	192.168.8.27
Netmask	255.255.240.0
Gateway	192.168.8.1
DNS	192.168.8.1

WiFi	
Role	AP
State	Up
Rx Flow	0B 0B/s

Figure 3-31 Status

### 3.5.2 Ethernet

Information for configuring the receiver ethernet network. In static address mode, IP, mask, gateway and DNS need to be entered manually, as shown below:



Z31426669013312		admin	English	[Logout]
General	Ethernet			
User				
GNSS Status				
GNSS Config				
Network				
Status				
Ethernet				
WiFi				
Mobile				
Manual Route				
Auto Route				
Tool				
Storage				

Link	
Mode:	Enable

IPv4	
Mode:	DHCP Client

IPv6	
Mode:	None

Figure 3- 32 Ethernet

### 3.5.3 WiFi

It is used to configure the related information of WiFi network, supports access point and station mode, as shown below:

The screenshot shows the WiFi configuration page. The left sidebar contains a menu with options: General, User, GNSS Status, GNSS Config, Network (highlighted), Status, Ethernet, WiFi, Mobile, Manual Route, Auto Route, Tool, Storage, Data Port, and Platform. The main content area is titled 'WiFi' and features a 'Link Layer' section with the following settings: Role (AP), SSID (AP), PSK (masked with dots), WPA (WPA2-PSK), Pairwise (CCMP), and Channel (01 (2.412 GHz)). A note next to the PSK field states 'Empty or Length not less than 8'. Below the Link Layer section is an 'IPv4' section.

Figure 3- 33 WiFi

### 3.5.4 Mobile

Used to set the APN parameter settings in the mobile network mode (mobile phone card to access the Internet). As shown below:

The screenshot shows the Mobile configuration page. The left sidebar is identical to the previous figure, with 'Mobile' highlighted in the menu. The main content area is titled 'Mobile' and includes an 'Enable' checkbox which is checked. Below this, there are several settings: Search Mode (Auto), APN Name (2G, 3G, 4G), APN user (2G&3G, 3G&4G), APN password (3G&4G), and Log (Normal).

Figure 3- 34 Mobile

### 3.5.5 Manual Route

Used to configure protocols, targets, gateways, etc., as shown below:

The screenshot shows the 'Manual Route' configuration page. The left sidebar contains a menu with options: General, User, GNSS Status, GNSS Config, Network (highlighted), Status, Ethernet, WiFi, Mobile, Manual Route, Auto Route, and Tool. The main content area has a table with the following data:

Number	Protocol	Target	Gateway	Iface	Metric
1	IPv4	10.10.10.0/24		wlan0	723
2	IPv4	192.168.0.0/20		eth0	711
3	IPv4	default	192.168.8.1	eth0	811

Below the table is a form to add a new rule with fields for Protocol (dropdown), Target, Gateway, Iface, and Metric, and a Delete button. At the bottom right are 'Clear Rules' and 'New Rule' buttons.

Figure 3-35 Manual Route

### 3.5.6 Auto Route

By configuring the initial priority, ping parameters, ping address, and ping reward, the network routing priority is realized, as shown below:

The screenshot shows the 'Auto Route' configuration page. The left sidebar is the same as in Figure 3-35, with 'Auto Route' highlighted. The main content area has a 'Status' section with a table showing network priorities:

Network	Priority
Ethernet	1
WiFi	2
Mobile	3

Below this is the 'MMode' section with a dropdown menu showing 'Fixed Priority' (selected), 'Fixed Priority', and 'Auto Priority'. The 'Fixed Priority' section contains a table with the following data:

Priority	Network	Operation
1	Ethernet	↓
2	WiFi	↑ ↓

Figure 3-36 Auto Route

### 3.5.7 Tool

The receiver provides three network tools: Ping, Traceroute and Telnet, which are used to test the network connection status of the receiver online, as shown below:

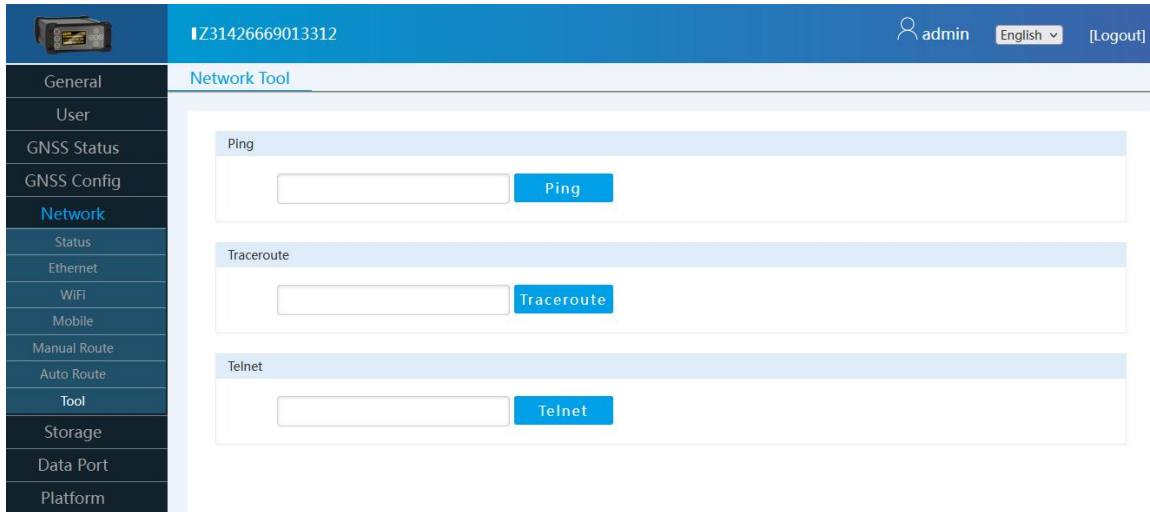


Figure 3- 37 Tool

## 3.6 Storage

### 3.6.1 Status

Displays the overall storage status of the receiver, the files currently being stored, and the writing speed, as shown below:

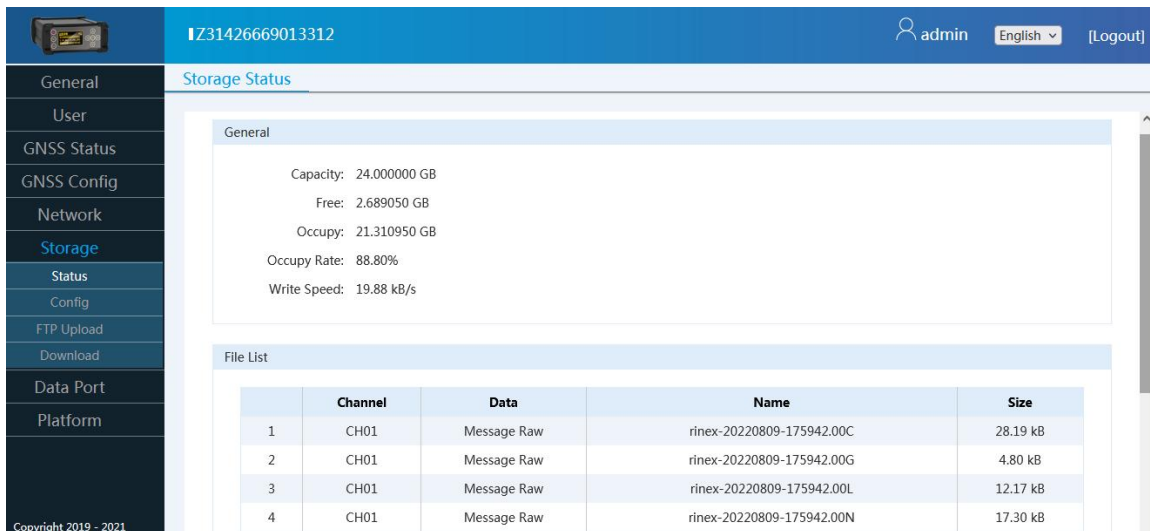


Figure 3- 36 Status

### 3.6.2 Config

It is used to configure the storage type, format and duration of data. The receiver provides 5 storage channels for users to set. The duration of data stored in a single file is 1 day (in natural days), and it can also be stored according to a time plan. If configured If it is not empty, it is considered to be stored in the whole time period by default, as shown below:

Figure 3- 37 Config

### 3.6.3 FTP Upload

The receiver provides FTP remote storage function for 5 storage channels. The running user stores the corresponding channel data to the remote receiver through FTP, as shown below: (Note: Not real-time uploading, uploading will only be performed after the corresponding channel file recording is completed)

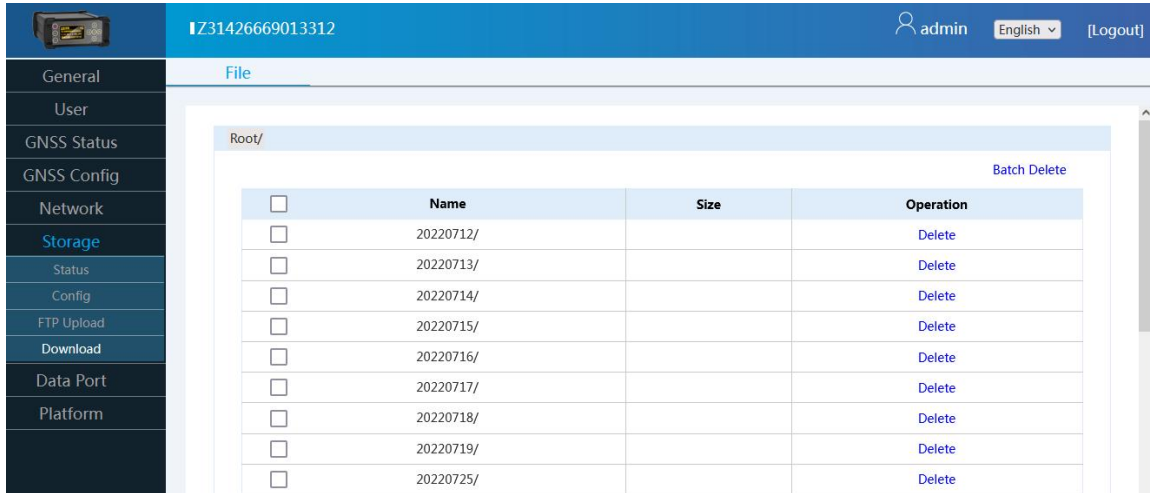
Enable	Channel	Path	Username	Password
<input checked="" type="checkbox"/> Enable	CH01			.....
<input checked="" type="checkbox"/> Enable	CH02			.....
<input checked="" type="checkbox"/> Enable	CH03			.....
<input checked="" type="checkbox"/> Enable	CH04			.....
<input checked="" type="checkbox"/> Enable	CH05			.....

Path format : ftp://host:port/directory/

Figure 3- 38 FTP Upload

### 3.6.4 Download

Enter the file download page, the first page displays the folder named by the date, click the folder to enter the folder named after the storage channel, click the corresponding channel, the data stored in the corresponding channel, click the download interface, download the corresponding channel file, as shown below:



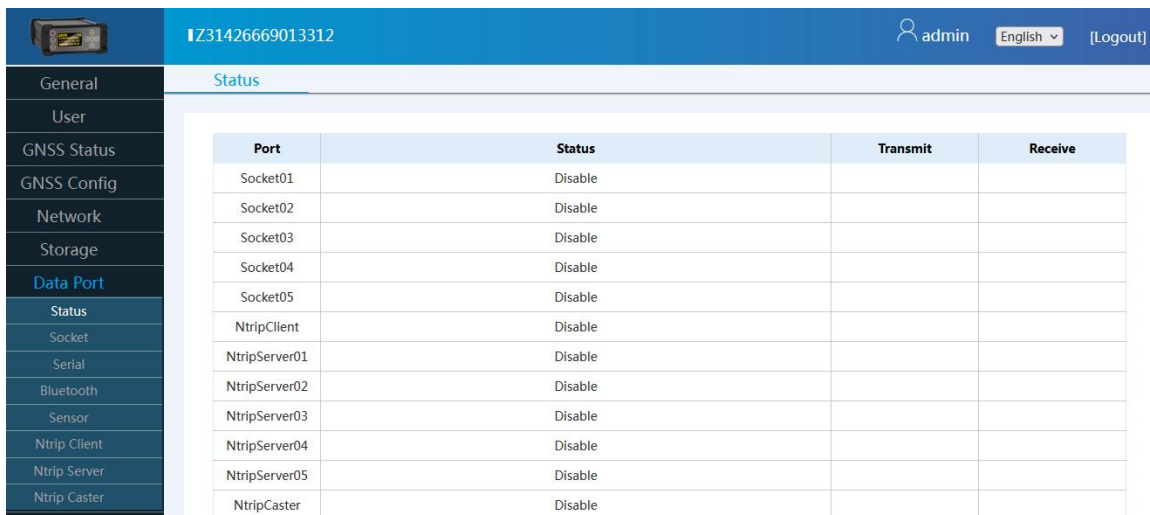
<input type="checkbox"/>	Name	Size	Operation
<input type="checkbox"/>	20220712/		Delete
<input type="checkbox"/>	20220713/		Delete
<input type="checkbox"/>	20220714/		Delete
<input type="checkbox"/>	20220715/		Delete
<input type="checkbox"/>	20220716/		Delete
<input type="checkbox"/>	20220717/		Delete
<input type="checkbox"/>	20220718/		Delete
<input type="checkbox"/>	20220719/		Delete
<input type="checkbox"/>	20220725/		Delete

Figure 3- 39 Download

## 3.7 Data Port

### 3.7.1 Status

It is used to view the status information of each port of the receiver, as shown below:



Port	Status	Transmit	Receive
Socket01	Disable		
Socket02	Disable		
Socket03	Disable		
Socket04	Disable		
Socket05	Disable		
NtripClient	Disable		
NtripServer01	Disable		
NtripServer02	Disable		
NtripServer03	Disable		
NtripServer04	Disable		
NtripServer05	Disable		
NtripCaster	Disable		

Figure 3- 40 Status

### 3.7.2 Socket

The receiver provides 5-way network connections (supports TCP, UDP server and client modes), as shown below:

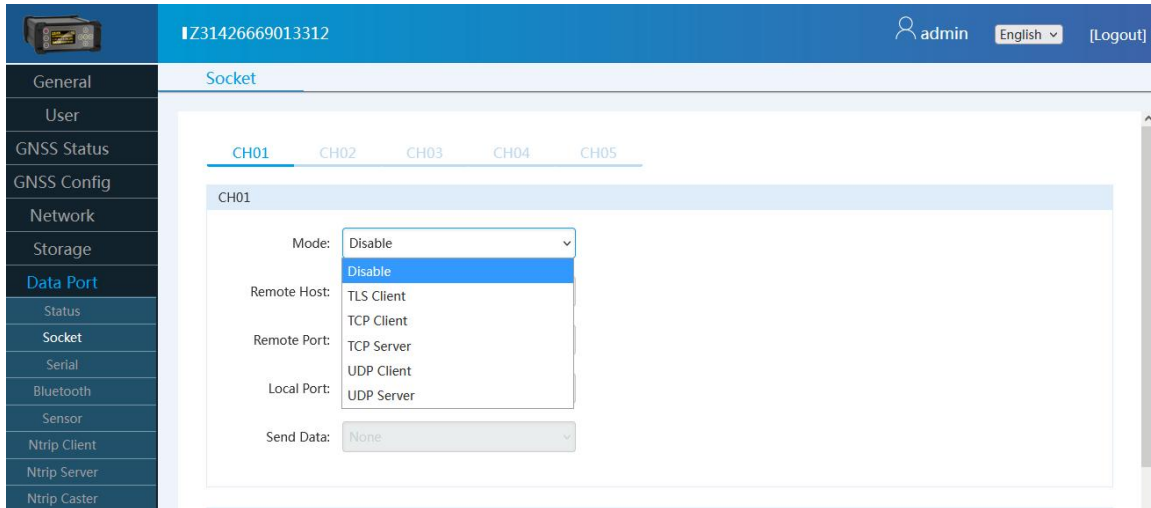


Figure 3- 41 Socket

For example, NET660 is used as the base station. When using TCP to transmit data, the TCP server should be selected, as shown below:

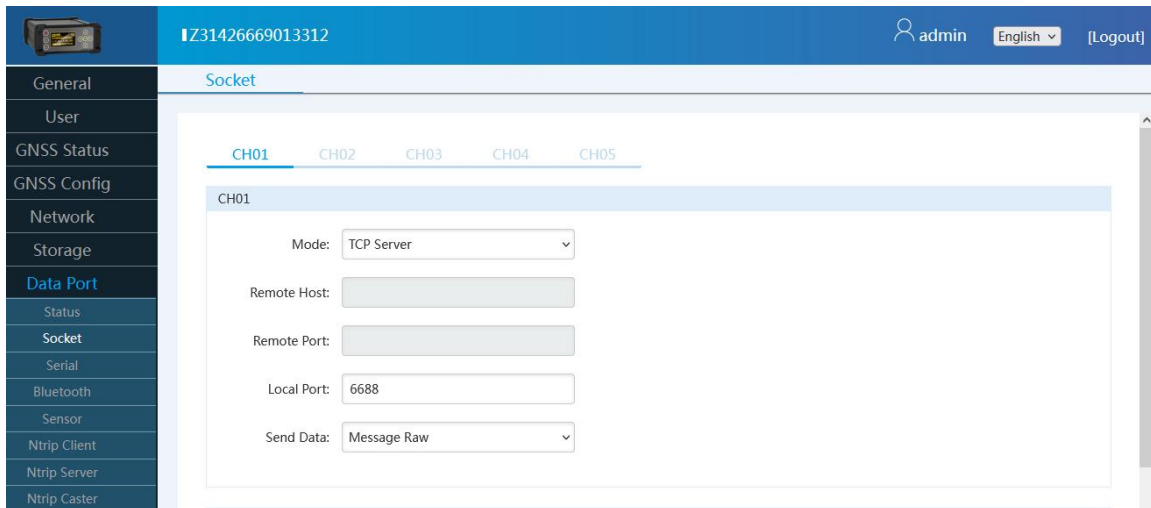


Figure 3- 42 Base Station - TCP Server

For example, NET660 is used as a mobile station. When using TCP to receive data, a TCP client should be selected, as shown below:

IZ31426669013312 admin English [Logout]

General User GNSS Status GNSS Config Network Storage **Data Port** Status **Socket** Serial Bluetooth Sensor Ntrip Client Ntrip Server Ntrip Caster

CH01 CH02 CH03 CH04 CH05

CH01

Mode: TCP Client

Remote Host: 192.168.8.141

Remote Port: 8866

Local Port: 6688

Send Data: Message Diff

Figure 3- 43 Rover - TCP Client

### 3.7.3 Serial

The receiver provides external serial communication function. The baud rate of COM1 and COM2 can support the minimum 1200bps and the maximum support 921600bps, as shown below:

IZ31426669013312 admin English [Logout]

General User GNSS Status GNSS Config Network Storage **Data Port** Status **Socket** **Serial** Bluetooth Sensor Ntrip Client Ntrip Server Ntrip Caster

Serial Port

COM1 :

Baudrate: 115200 bps

Send Data: Message Diff

COM2 :

Baudrate: 115200 bps

Send Data: Message Diff

Authentication

Password: 115200 bps

Figure 3- 44 Serial

### 3.7.4 Bluetooth

The receiver provides a bluetooth interface externally, you can configure the bluetooth output data type through this page, as shown below:

The screenshot shows the Bluetooth configuration page. The sidebar on the left lists various system settings. The main panel has a 'Bluetooth' header with an 'Enable' checkbox checked. Below this, there's a 'Send Data' dropdown menu with 'None' selected. An 'Authentication' section contains a 'Password' field. An 'Apply' button is located at the bottom right of the configuration area.

Figure 3- 45 Bluetooth

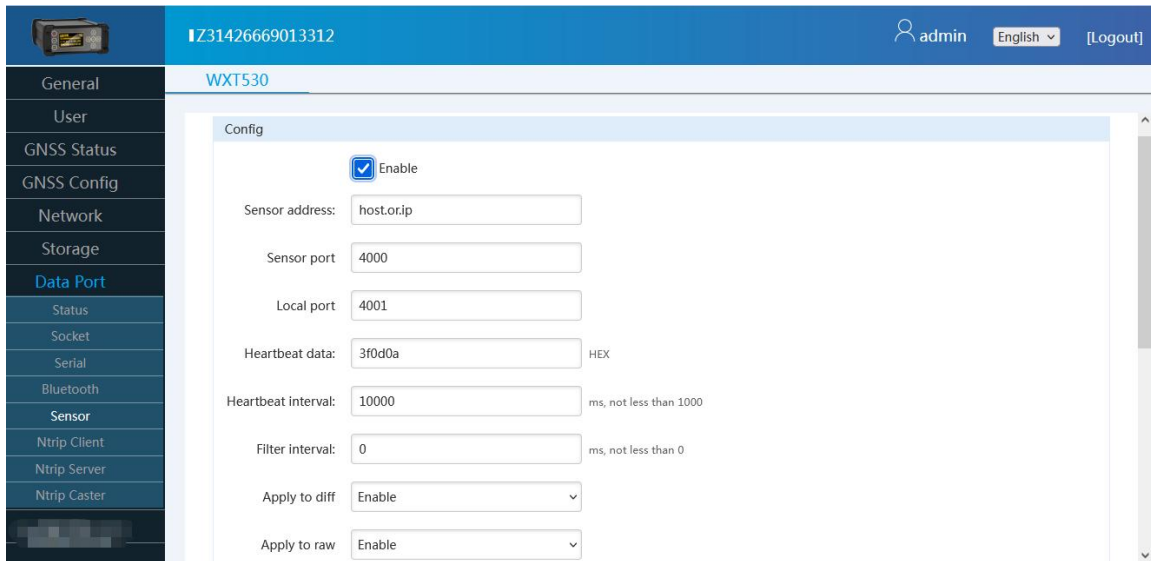
### 3.7.5 Sensor

The receiver provides an external sensor access interface and configures it accordingly, as shown below:

The screenshot shows the Sensor configuration page. The sidebar on the left lists various system settings. The main panel has a 'Sensor' header. Below this, there's a table with columns: Type, Number, Config, and Operation. The table contains one entry for 'VAISALA WXT530 Series' with number '1111'. Below the table, there's an 'Authentication' section with a 'Password' field. An 'Apply' button is located at the bottom right of the configuration area.

Type	Number	Config	Operation
VAISALA WXT530 Series	1111	<a href="#">Config</a>	<a href="#">Delete</a>
<a href="#">Please Select</a>	<input type="text"/>		<a href="#">Add</a>

Figure 3- 46 Sensor



WXT530

Config

☒ Enable

Sensor address:

Sensor port:

Local port:

Heartbeat data:  HEX

Heartbeat interval:  ms, not less than 1000

Filter interval:  ms, not less than 0

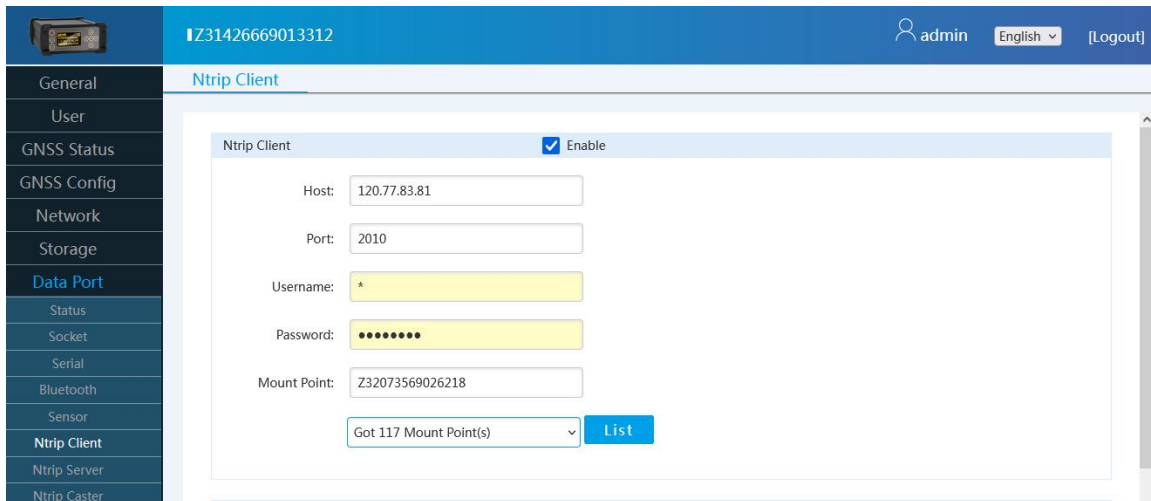
Apply to diff:

Apply to raw:

Figure 3-47 Sensor Config

### 3.7.6 Ntrip Client

The parameter configuration when the receiver is used as the Ntrip Client is used for the receiver to obtain the difference from the server, as shown below:



Ntrip Client

☒ Enable

Host:

Port:

Username:

Password:

Mount Point:

Got 117 Mount Point(s)

Figure 3- 48 Ntrip Client

### 3.7.7 Ntrip Server

The parameter configuration when the receiver is used as the Ntrip Server is used for the receiver to send data to the server, as shown below:

The screenshot displays the 'Ntrip Server' configuration page. The top header shows the device ID 'Z31426669013312', a user profile 'admin', and language 'English'. The left sidebar lists various system settings. The main content area is titled 'Ntrip Server' and features tabs for CH01 through CH05. The 'CH01' tab is active, showing a configuration form with the following fields: 'Version' set to 'Ntrip/1.0', 'Host' set to '120.77.83.81', 'Port' set to '6060', 'Mount Point' set to 'Z31426669013312', 'Username' set to 'u', 'Password' masked with dots, 'Data' set to 'Message Diff', and 'Heartbeat' set to 'Disable'. An 'Enable' checkbox is checked at the top of the CH01 section.

Figure 3- 49 Ntrip Server

### 3.7.8 Ntrip Caster

The parameter configuration when the receiver is used as the Ntrip distributor. It is used for the receiver to provide data externally as Ntrip Caster. If other receivers or clients want to use the receiver Caster service, the corresponding user must have the NtripCaster permission, as shown below:

The screenshot displays the 'Ntrip Caster' configuration page. The top header is identical to the previous figure. The left sidebar is also the same. The main content area is titled 'Ntrip Caster' and features an 'Enable' checkbox which is checked. Below this, there are fields for 'Check User' (checked), 'Port' (2101), 'Mount Point' (ntrip), and 'Data' (Message Diff). An 'Authentication' section contains a 'Password' field masked with dots. An 'Apply' button is located at the bottom right of the configuration area.

Figure 3- 50 Ntrip Caster

Users should have the NtripCaster permission to use the Caster service

## 3.8 Platform

### 3.8.1 ZXVPN

The receiver sets the parameters for connecting to the Devecent platform, as shown below:

The screenshot displays the ZXVPN configuration page. The top header shows the device ID 'I231426669013312', the user 'admin', the language 'English', and a '[Logout]' link. The left sidebar lists various configuration categories, with 'ZXVPN' selected. The main area has tabs for 'CH01', 'CH02', and 'CH03'. Under the 'CH01' tab, there is a section for 'CH01' with an 'Enable' checkbox checked. Below this are input fields for 'Host' (zxvpn.devecent.com), 'Port' (8222), 'Network' (TEST), 'Username' (zxvpn), and 'Password' (masked). At the bottom, a 'State' section indicates the device is 'Online' with the address '10.1.4.131'.

Figure 3- 51 ZXVPN

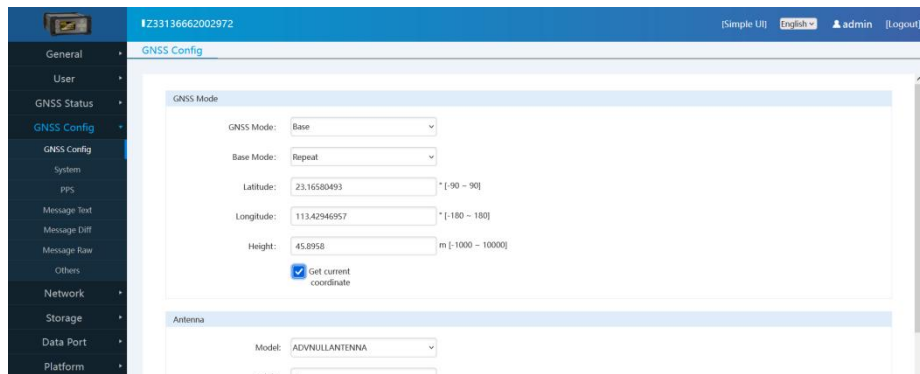
## 4. Configuration examples

In order to make it easier for users to understand the use and configuration of the NET660UNH receiver, we have specially selected four commonly used working modes as an example to illustrate the corresponding configuration mode and process.

### 4.1 Example 1

Receiving the machine as a base station, starting with fixed coordinates, differentially outputting RTCM33 MSM4, sending RTCM33 MSM4 differentials, the configuration is as follows:

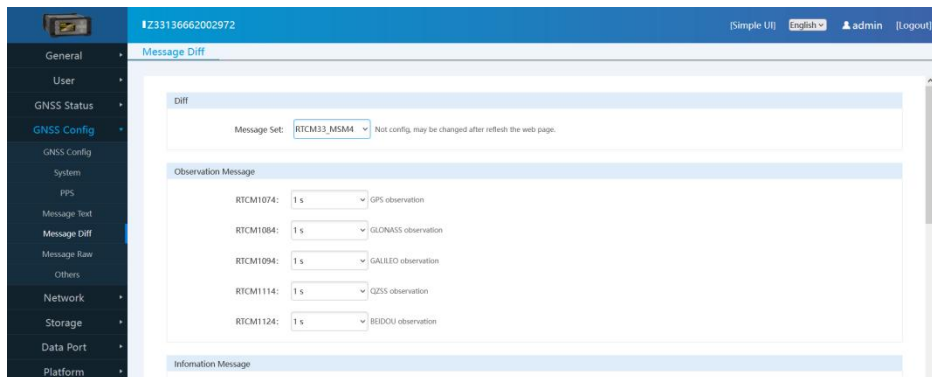
① Set the receiver as a base station and start with fixed coordinates, display as follows:



The screenshot shows the 'GNSS Config' web interface. The left sidebar contains a menu with options: General, User, GNSS Status, GNSS Config (selected), System, PPS, Message Text, Message Diff, Message Raw, Others, Network, Storage, Data Port, and Platform. The main content area is titled 'GNSS Mode' and contains the following fields: 'GNSS Mode' (dropdown menu set to 'Base'), 'Base Mode' (dropdown menu set to 'Repeat'), 'Latitude' (text input field with value '23.16580493' and range '[ -90 ~ 90 ]'), 'Longitude' (text input field with value '113.42946957' and range '[ -180 ~ 180 ]'), 'Height' (text input field with value '45.8958' and range 'm [-1000 ~ 10000]'), and a checked checkbox labeled 'Get current coordinate'. Below these fields is an 'Antenna' section with a 'Model' dropdown menu set to 'ADVNULANTENNA'.

Figure 4-1 Base Station Configuration

② Set the differential output to RTCM33 MSM4, display as follows:



The screenshot shows the 'Message Diff' web interface. The left sidebar is the same as in Figure 4-1, with 'Message Diff' selected. The main content area is titled 'Diff' and contains the following fields: 'Message Set' (dropdown menu set to 'RTCM33\_MSM4' with a note 'Not config. may be changed after refresh the web page.'), 'Observation Message' (table with 5 rows), and 'Information Message' (empty section). The 'Observation Message' table has the following data:

Message	Interval	System
RTCM1074	1 s	GPS observation
RTCM1084	1 s	GLONASS observation
RTCM1094	1 s	GALILEO observation
RTCM1114	1 s	QZSS observation
RTCM1124	1 s	BEIDOU observation

Figure 4-2 Differential Output Configuration

③ Setting up an Ntrip server connection 1 to transmit RTCM33 MSM4 to a CORS

server using the Ntrip/1.0 protocol, with data source selection for positioning differential data, display as follows:

**Figure 4-3 Ntrip Server Configuration**

④ After a successful connection, you can check whether the connection is successful by looking at the status. If the connection is successful, it will display "Running", as shown below:

Port	Status	Transmit	Receive
Socket01	Disable		
Socket02	Disable		
Socket03	Disable		
Socket04	Disable		
Socket05	Disable		
Ntrip Client	Disable		
Ntrip Server01	Running	1.03 KB/s	
Ntrip Server02	Disable		
Ntrip Server03	Disable		
Ntrip Server04	Disable		
Ntrip Server05	Disable		
Ntrip Caster	Disable		
FixLink Client	Disable		

**Figure 4-4 Status**

## 4.2 Example 2

Receiver as a mobile station, obtaining differential data through Ntrip Client for positioning.

① Set the receiver as a mobile station, select Ntrip Client as the differential source for the mobile station, display as follows:

The screenshot shows the 'GNSS Config' page of a web interface. The left sidebar contains a menu with options: General, User, GNSS Status, GNSS Config (selected), System, PPS, Message Text, Message Diff, Message Raw, Others, Network, Storage, Data Port, and Platform. The main content area is titled 'GNSS Config' and includes a 'GNSS Mode' section with the following fields: 'GNSS Mode' (set to 'Rover'), 'Differential Source' (set to 'Ntrip Client'), 'RTK Diff Age Mac' (set to 60), and 'PSR Diff Age Mac' (set to 60). Below this is an 'Antenna' section with 'Model' (set to 'ADVNULLANTENNA'), 'Height' (set to 0), and 'Measure Type' (set to 'Phase'). The top of the page shows the device ID 'Z33136662002972', language 'English', and user 'admin'.

Figure 4-5 Mobile Station Configuration

② Configure the IP address and other related information for the Ntrip Client on the host machine, display as follows:

The screenshot shows the 'Ntrip Client' page of the same web interface. The left sidebar menu is the same, but 'Data Port' is selected. The main content area is titled 'Ntrip Client' and includes a checkbox 'Enable' which is checked. Below this are fields for 'Host' (set to 'rdevcent.com'), 'Port' (set to 6060), 'Username' (set to 'user'), 'Password' (masked with dots), and 'Mount Point' (set to 'Z34273634000016'). There is a 'List' button below the Mount Point field. At the bottom, there is an 'Authentication' section with a 'Password' field. The top of the page shows the device ID 'Z33136662002972', language 'English', and user 'admin'.

Figure 4-6 Ntrip Client Configuration

③ After a successful connection, you can check whether the connection is successful by looking at the status. If the connection is successful, it will display "Running", as shown below:


<div>  <span>IZ33136662002972</span> <span>[Simple UI] <span>English▼</span> admin [Logout]</span> </div>			
<div> <div> General User GNSS Status GNSS Config Network Storage Data Port Status Socket Serial Bluetooth Sensor Ntrip Client Ntrip Server Ntrip Caster </div> <div>Status</div> </div>			
Port	Status	Transmit	Receive
Socket01	Disable		
Socket02	Disable		
Socket03	Disable		
Socket04	Disable		
Socket05	Disable		
Ntrip Client	Running		111 B/s
Ntrip Server01	Disable		
Ntrip Server02	Disable		
Ntrip Server03	Disable		
Ntrip Server04	Disable		
Ntrip Server05	Disable		
Ntrip Caster	Disable		
FixLink Client	Disable		

Figure 4-7 Status