NET660 User Manual

Contents

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 (Tpy12V)
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:

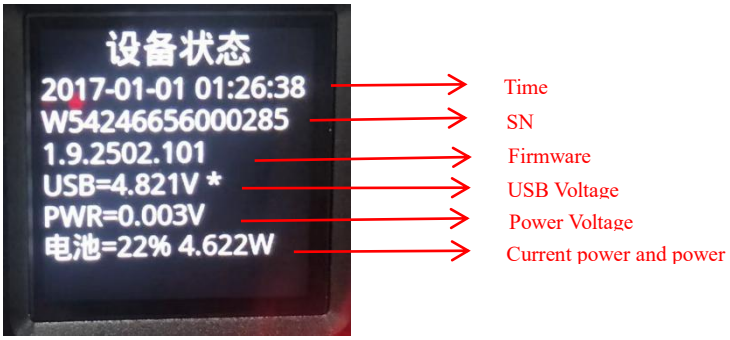


Figure 2-2 Info

Receiver GNSS status:

Figure 2- 3 GNSS

The current positioning coordinates of the receiver:

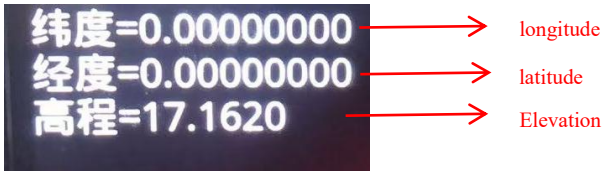


Figure 2- 4 Coordinates

The current network state of the receiver:

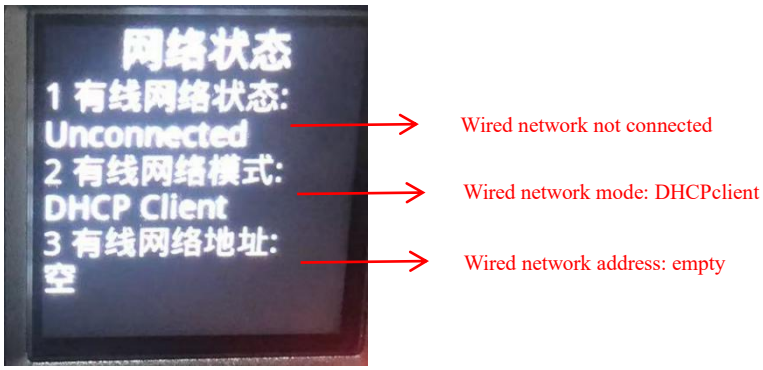
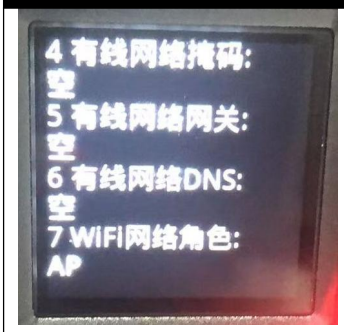


Figure 2-5 Running Status

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
	There are four network configuration modes: None, Static, DHCP Client, DHCP Server
    	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
	The DHCP client can be configured successfully by simply clicking OK
      	Compared with the DHCP client, the DHCP server also needs to configure the wired network start and end addresses

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.

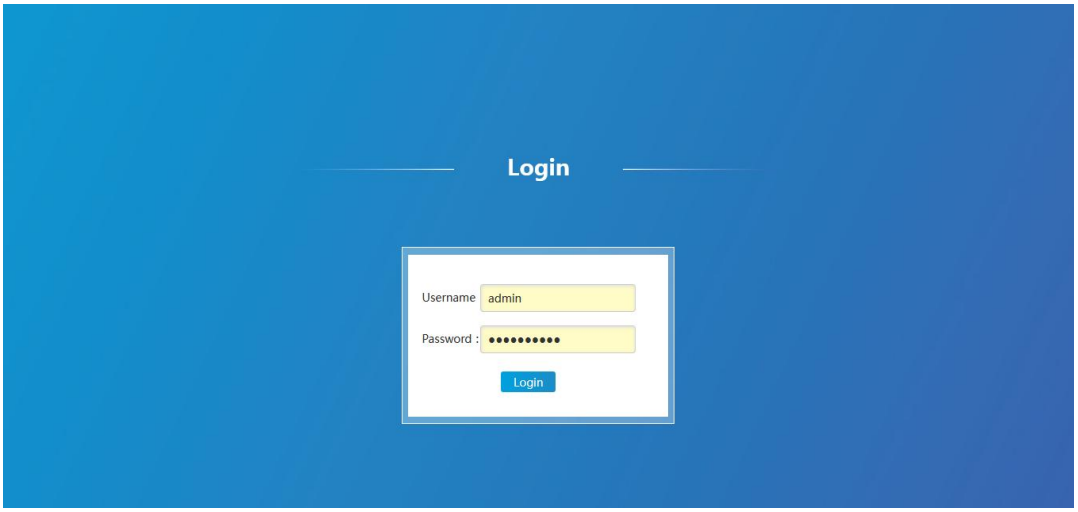


Figure 2-7 Login

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:

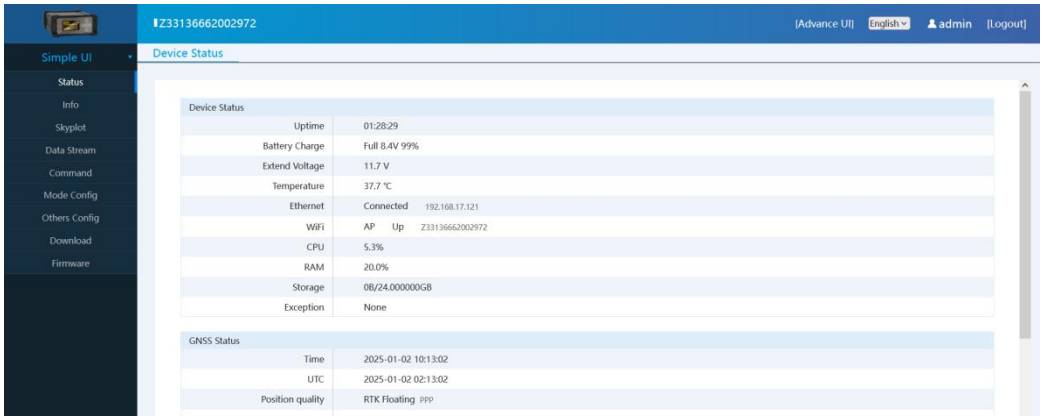


Figure 2- 8 Simple UI Status

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

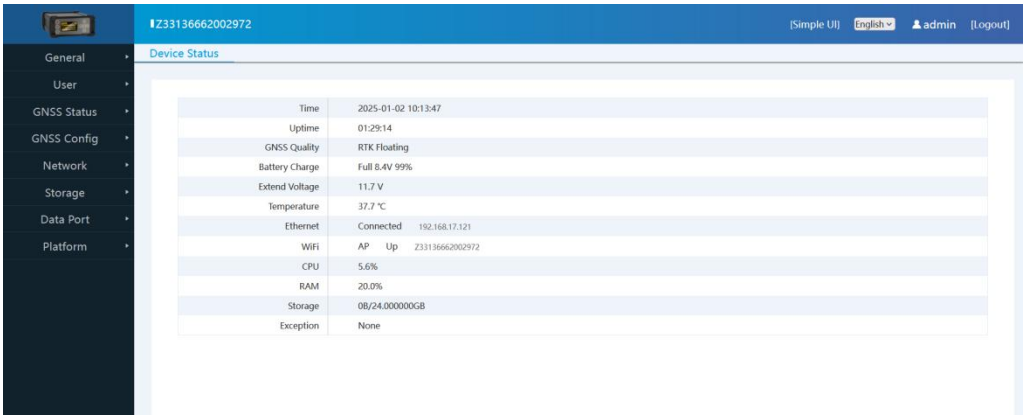


Figure 2- 9 Advance UI Status

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:

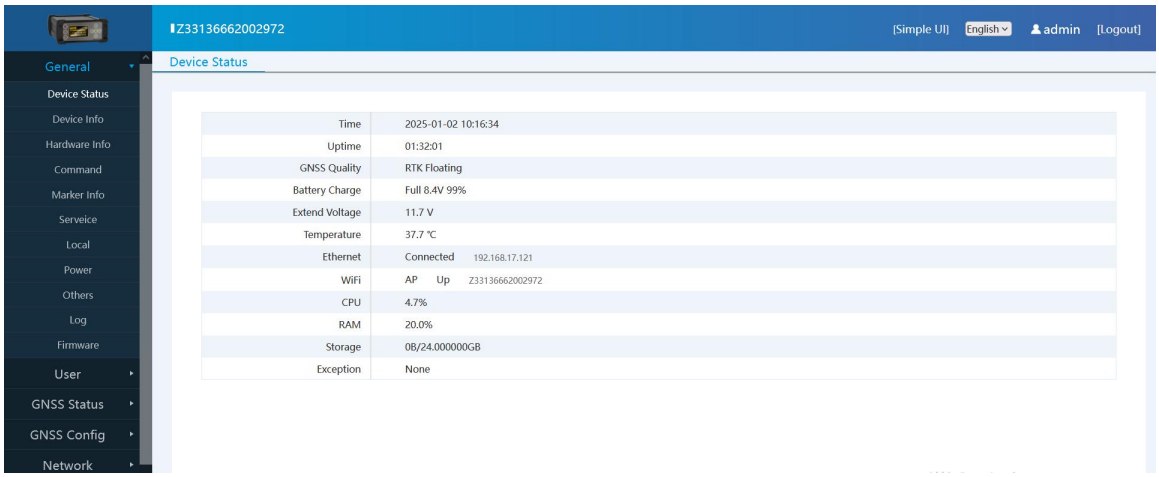


Figure 3- 1 Device Status

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:

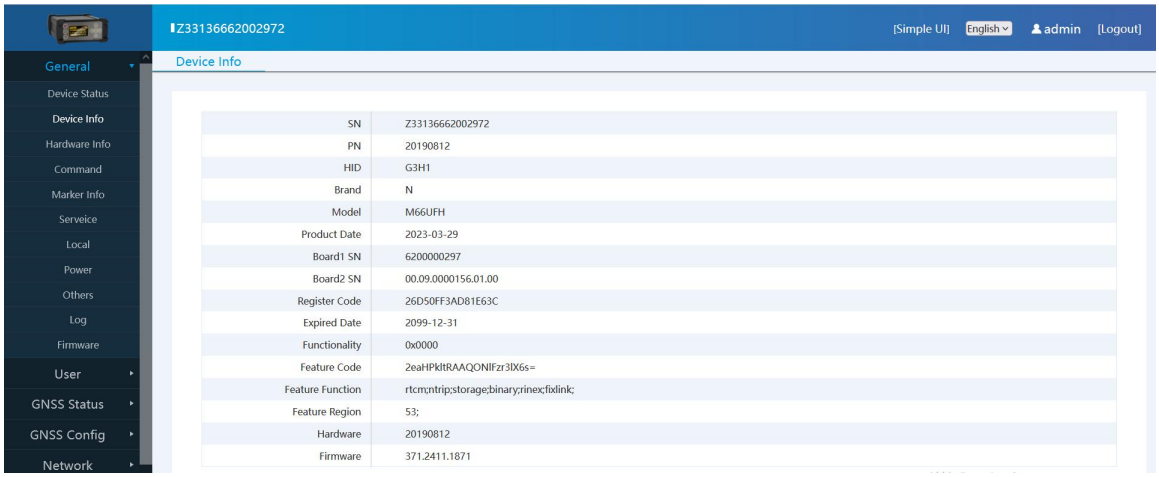


Figure 3- 2 Device Info

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:

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:

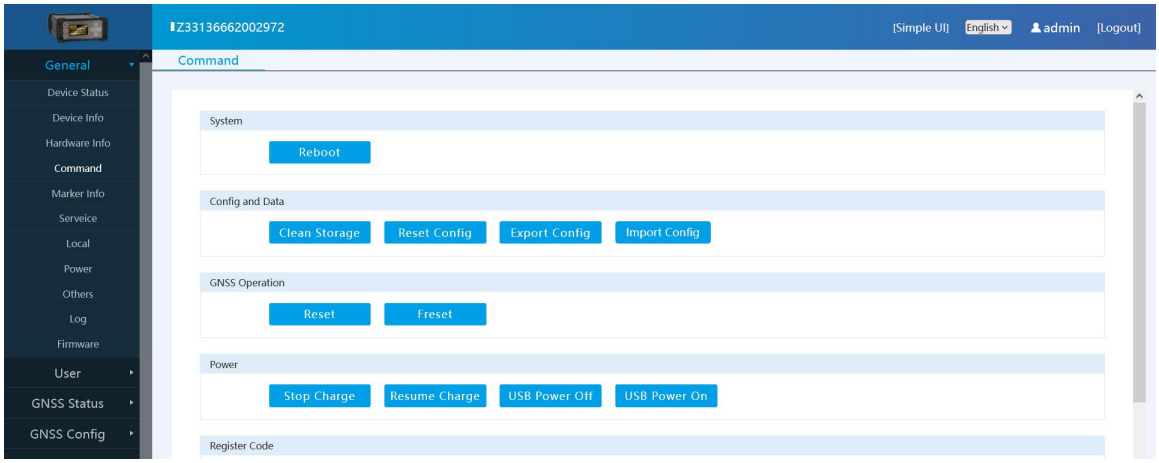


Figure 3- 4 Command

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:

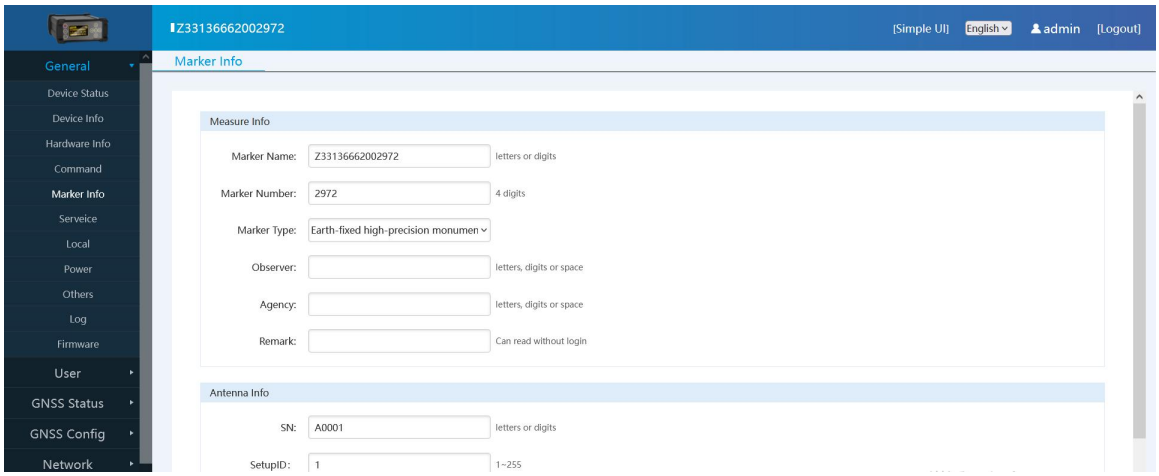


Figure 3- 5 Marker Info

3.1.6 Service

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

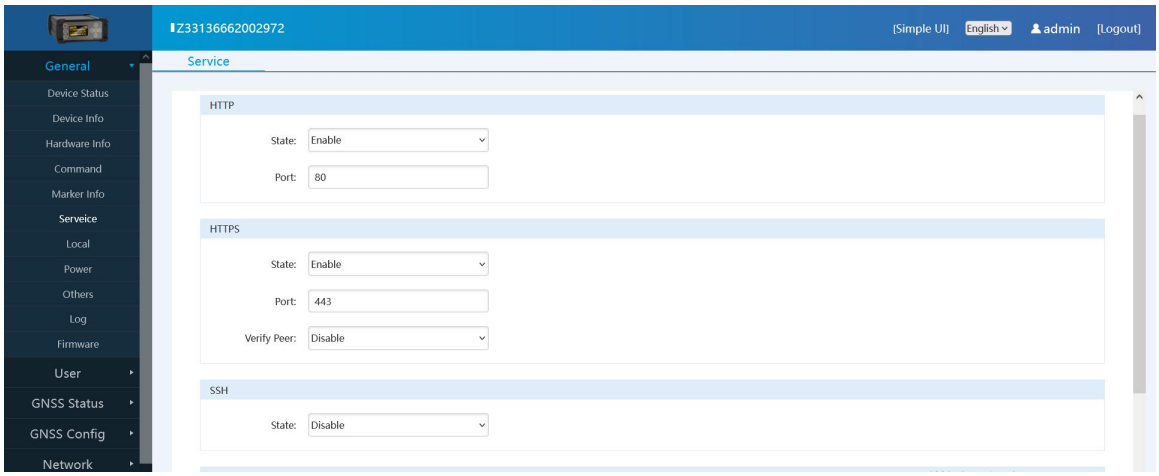


Figure 3- 6 Service

3.1.7 Local

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

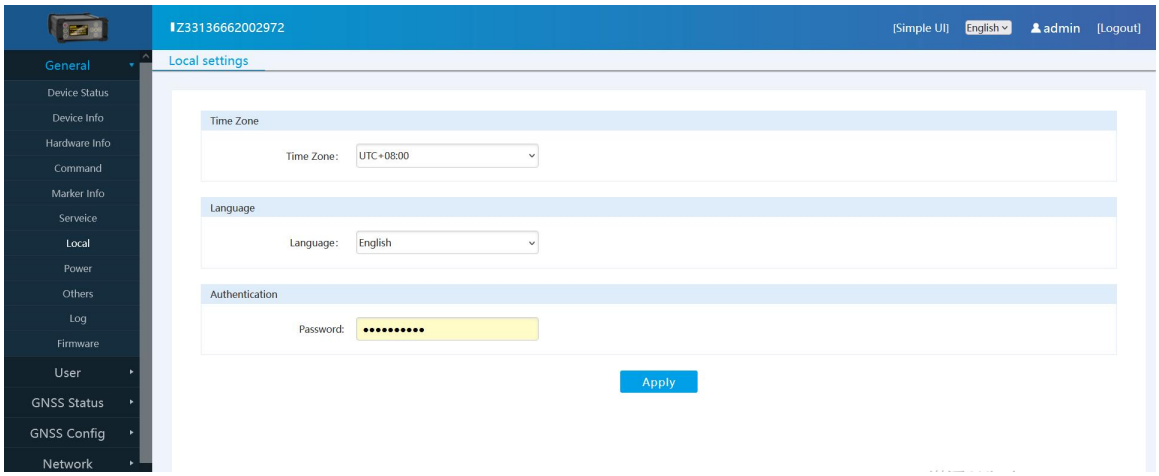


Figure 3- 7 Local

3.1.8 Power

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

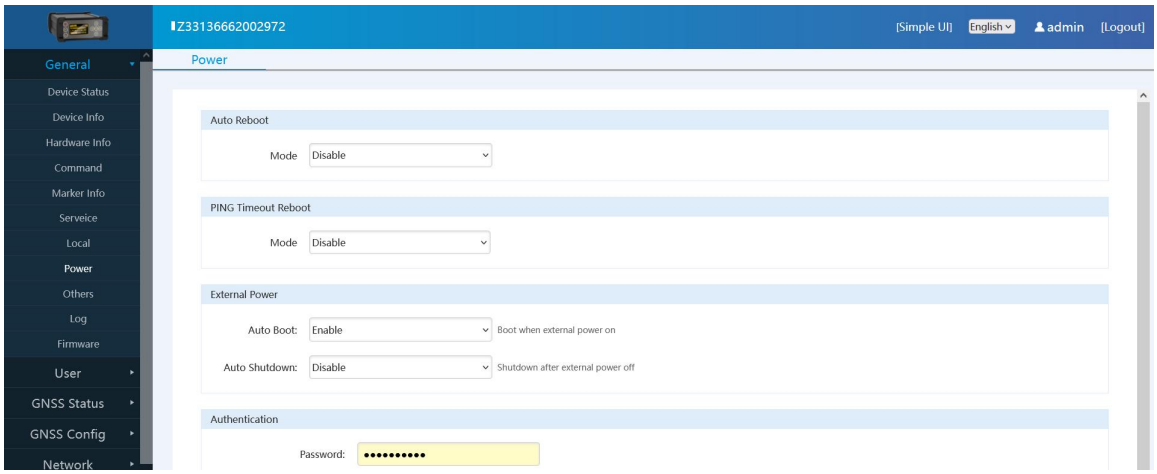


Figure 3- 8 Power

3.1.9 Others

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

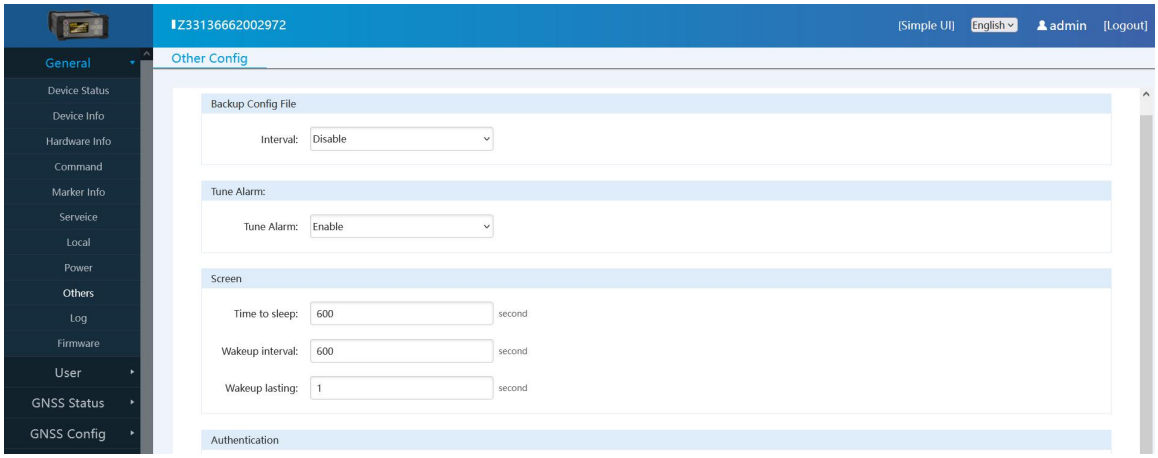


Figure 3- 9 Others

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:

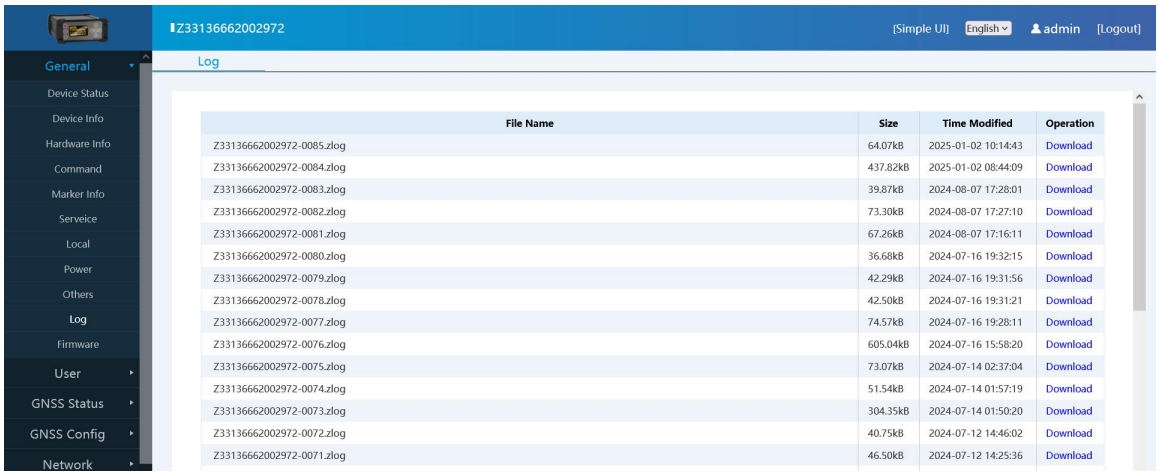


Figure 3- 10 Log

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:

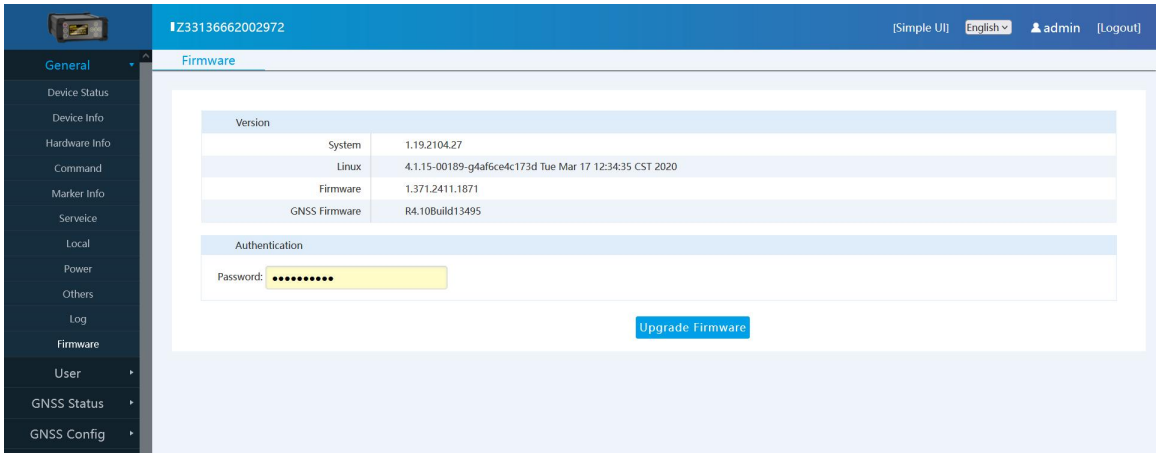


Figure 3- 11 Firmware

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:

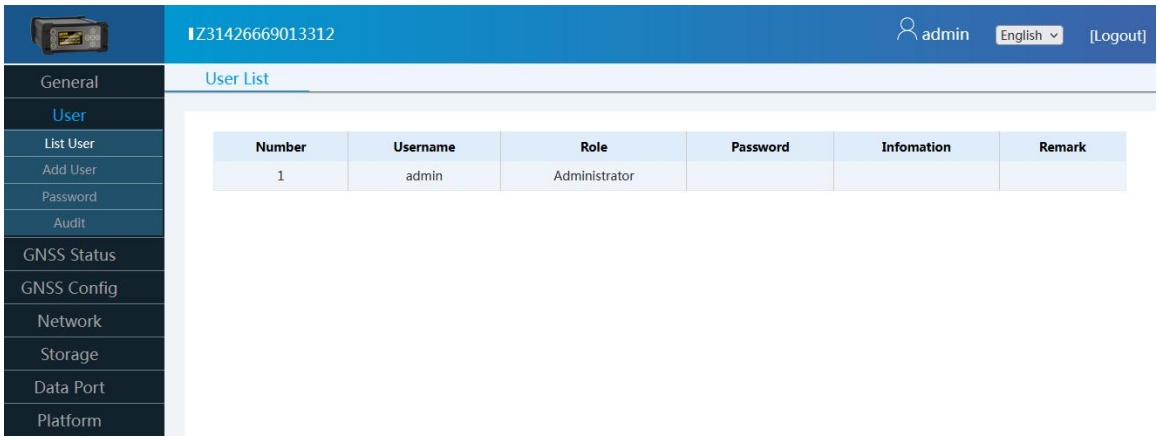


Figure 3- 12 List User

3.2.2 Add User

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

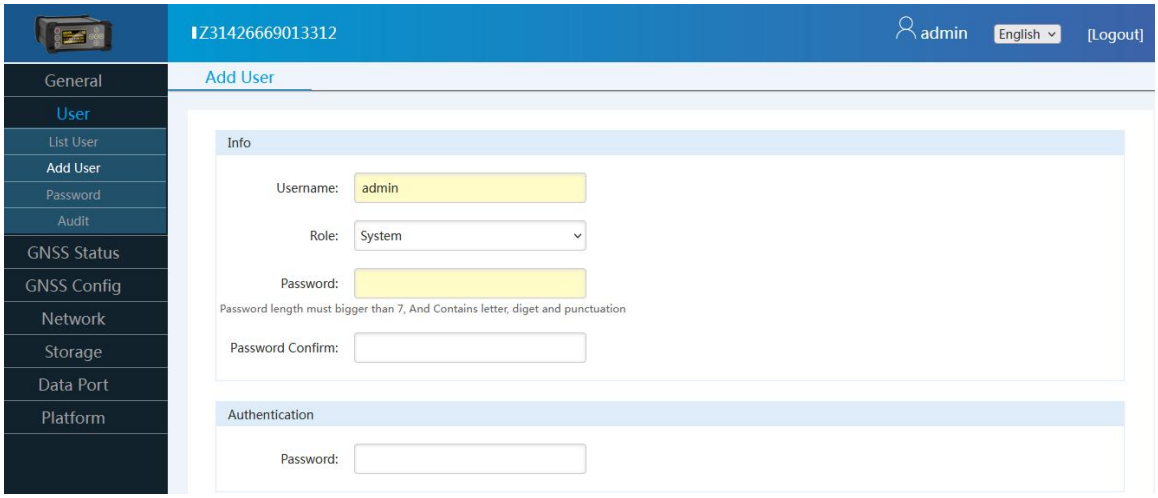


Figure 3- 13 Add User

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:

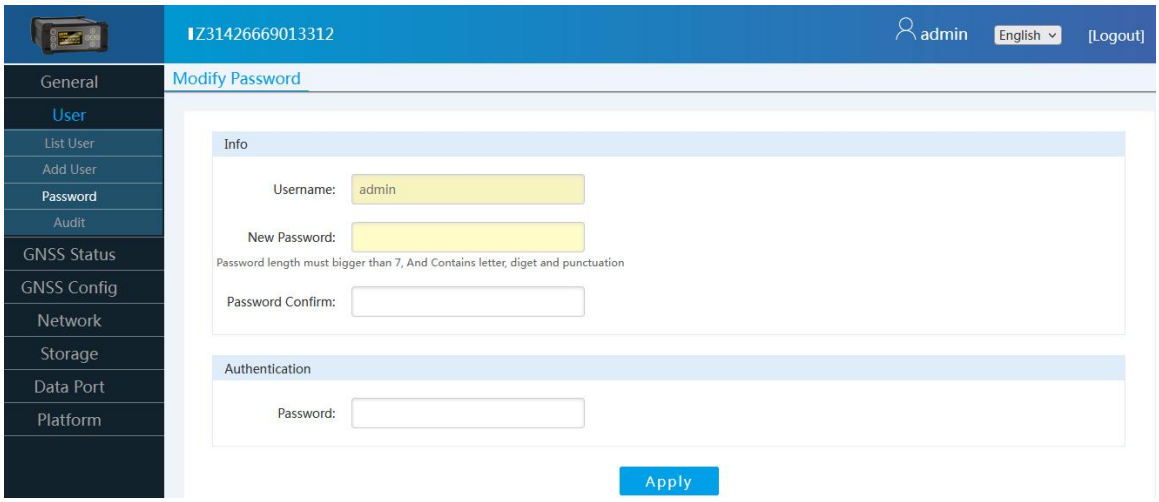


Figure 3-14 Password

3.2.4 Audit

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

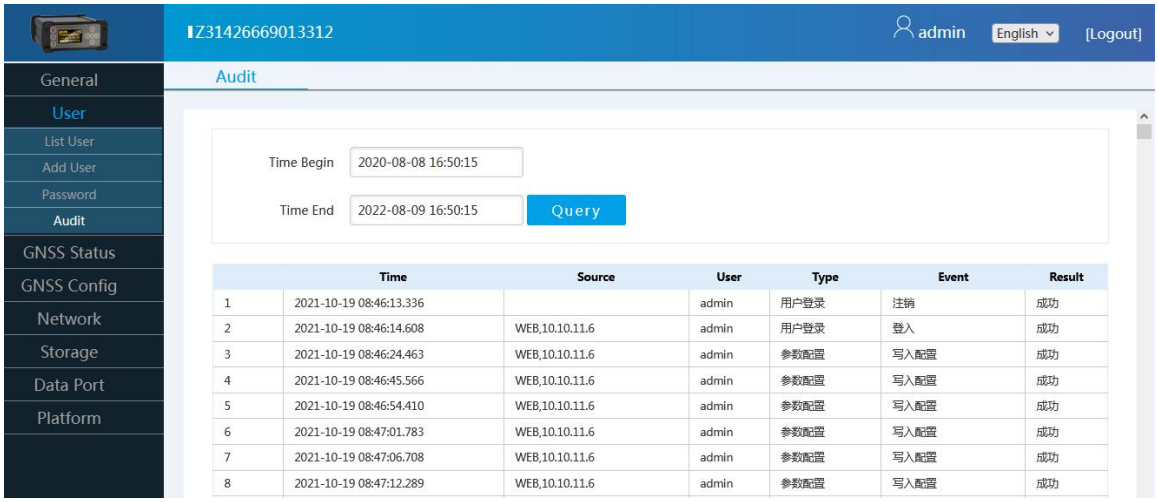


Figure 3- 15 Audit

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:

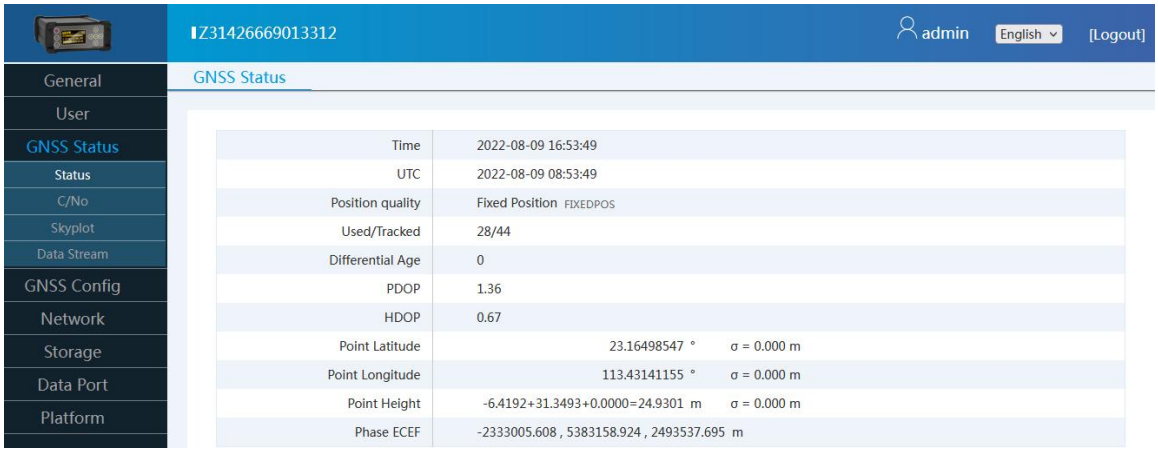
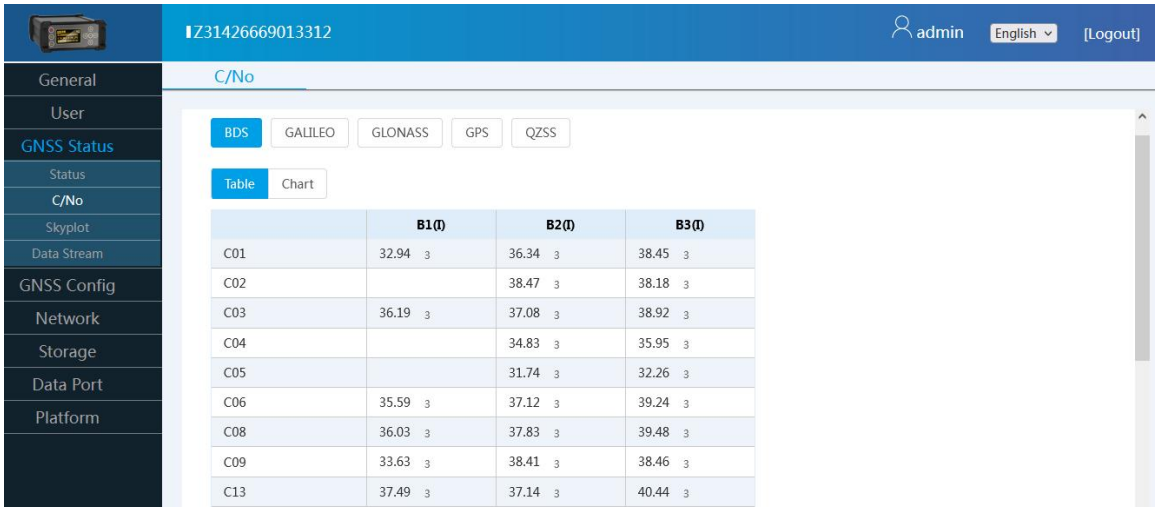


Figure 3- 16 Status

3.3.2 C/No

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.



	B1(I)	B2(I)	B3(I)
C01	32.94 3	36.34 3	38.45 3
C02		38.47 3	38.18 3
C03	36.19 3	37.08 3	38.92 3
C04		34.83 3	35.95 3
C05		31.74 3	32.26 3
C06	35.59 3	37.12 3	39.24 3
C08	36.03 3	37.83 3	39.48 3
C09	33.63 3	38.41 3	38.46 3
C13	37.49 3	37.14 3	40.44 3

Figure 3- 17 Table

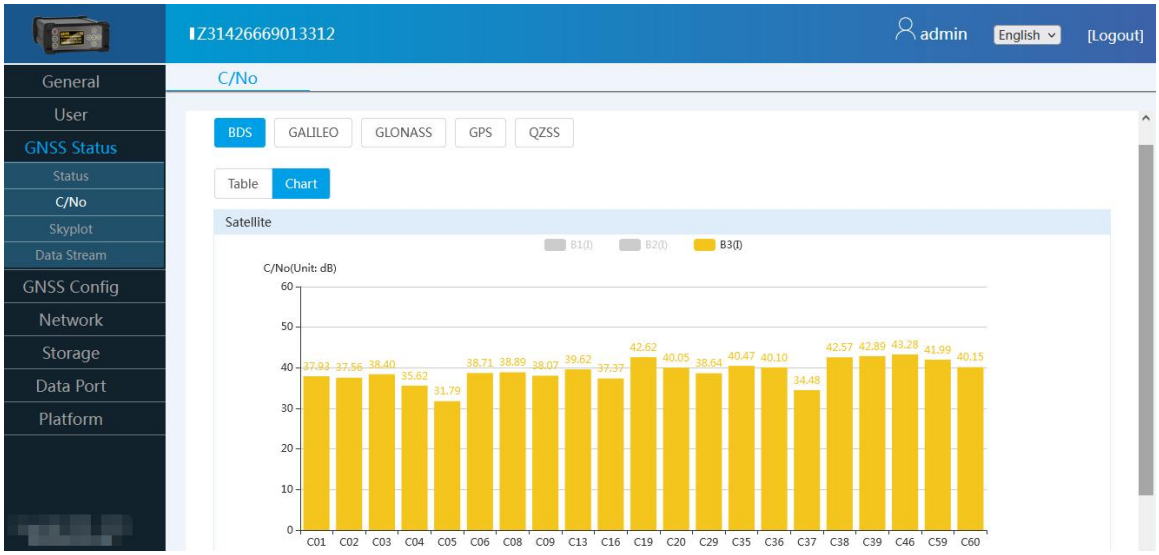


Figure 3- 18 Chart

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:

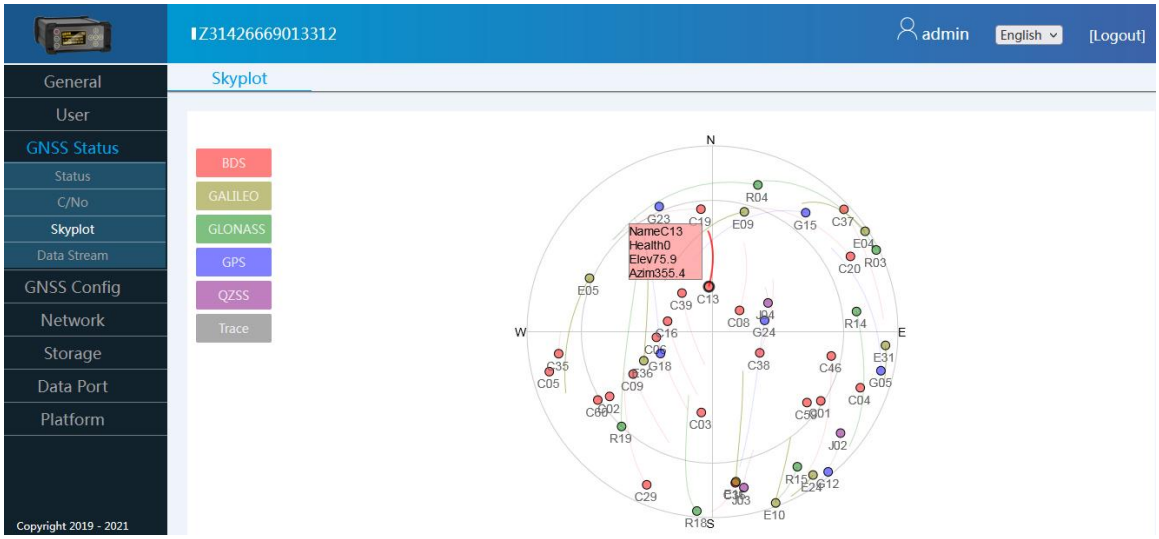


Figure 3- 19 Skyplot

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:

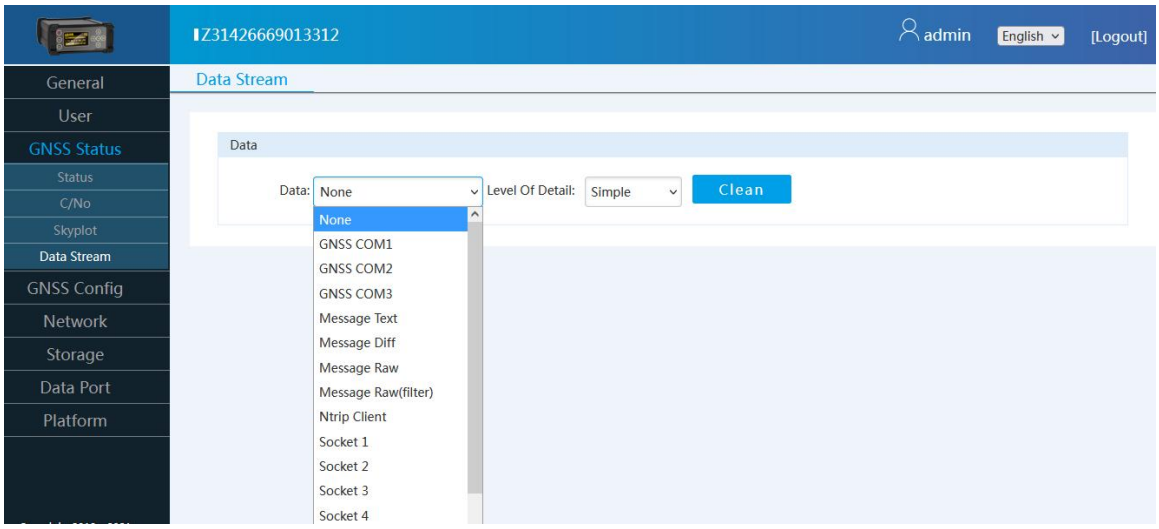


Figure 3- 20 Data Stream

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:

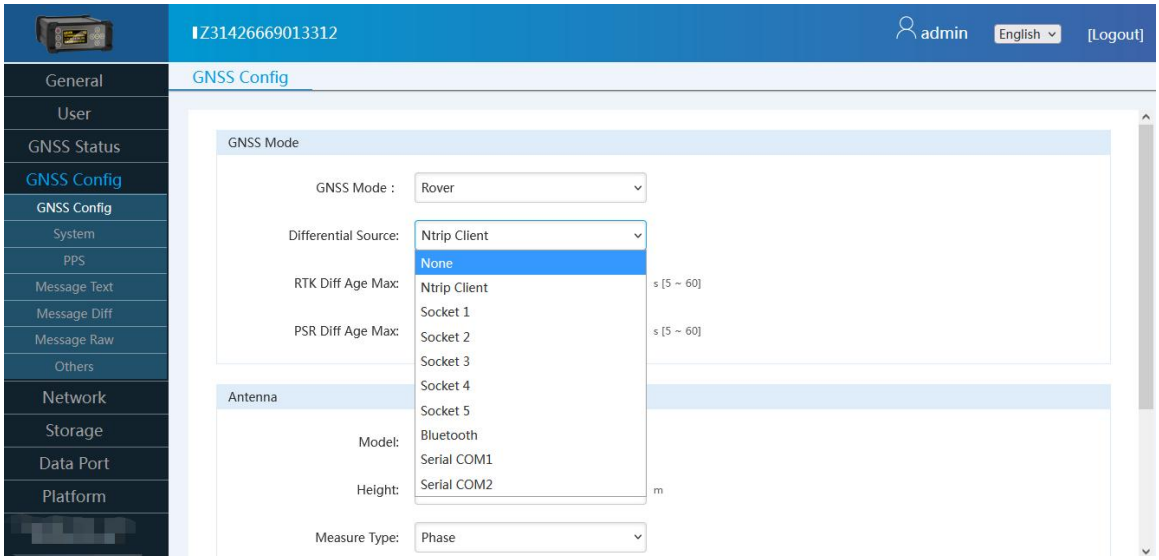


Figure 3- 21 Rover Mode

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:

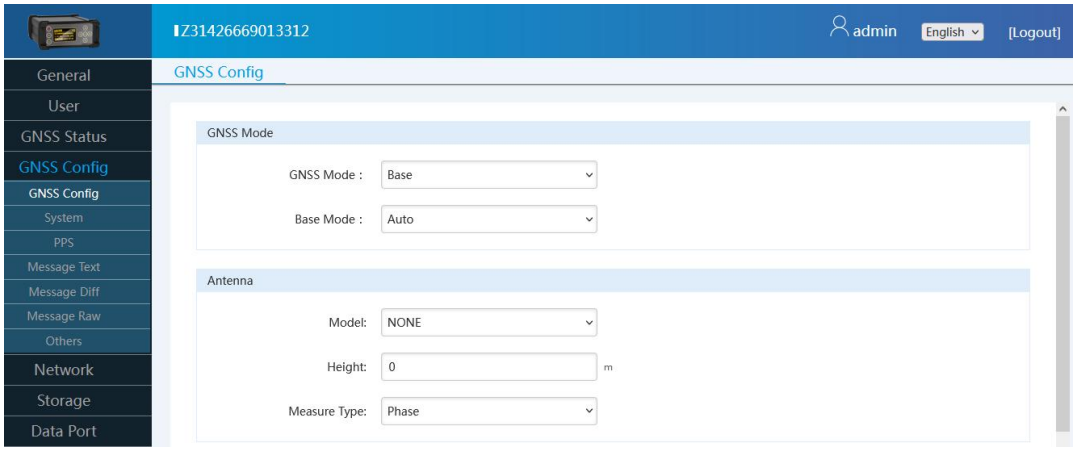


Figure 3- 22 Base Station Mode - Auto

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:

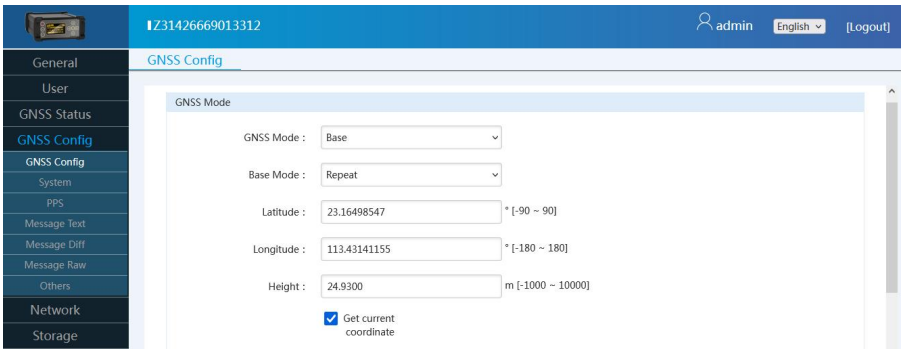


Figure 3- 23 Base Station Mode - Repeat

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

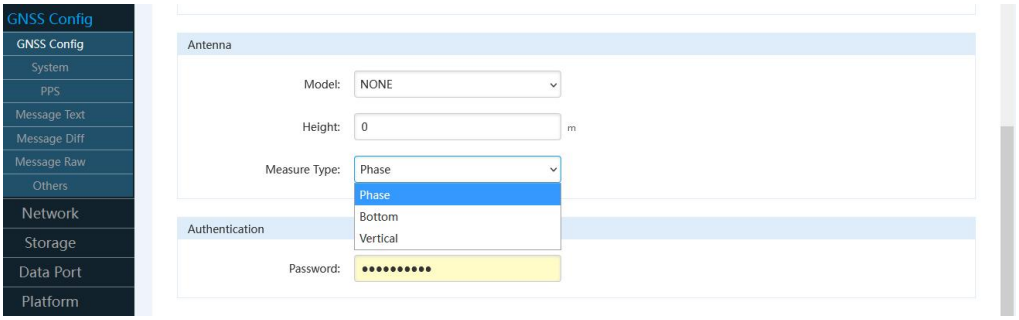


Figure 3- 24 Base station mode - Antenna

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 If it 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)

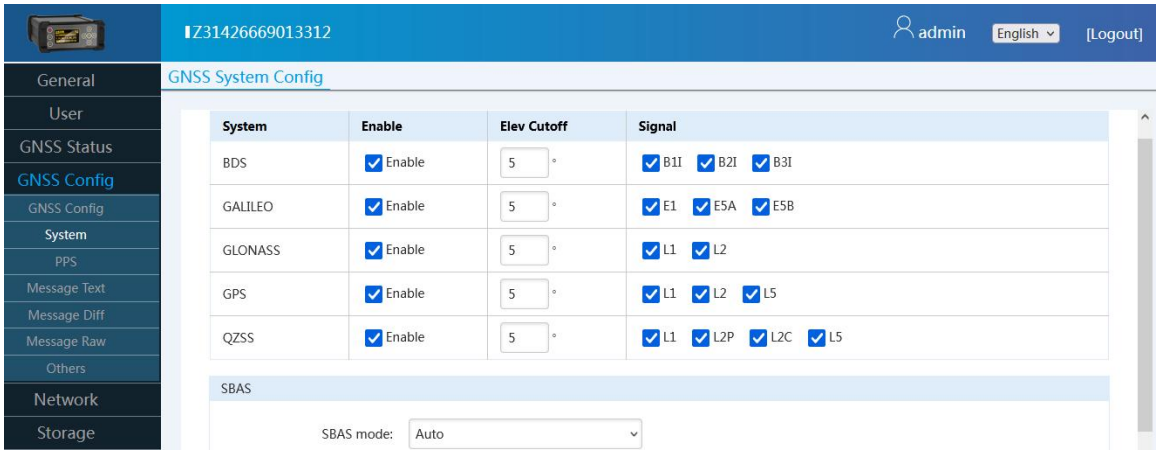


Figure 3- 25 System

3.4.3 PPS

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

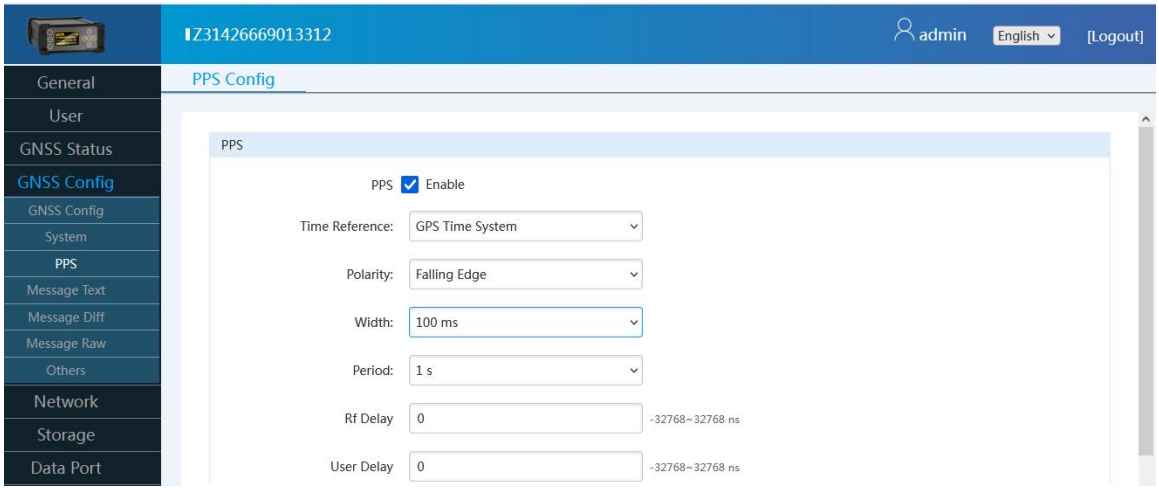


Figure 3- 26 PPS

3.4.4 Message Text

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

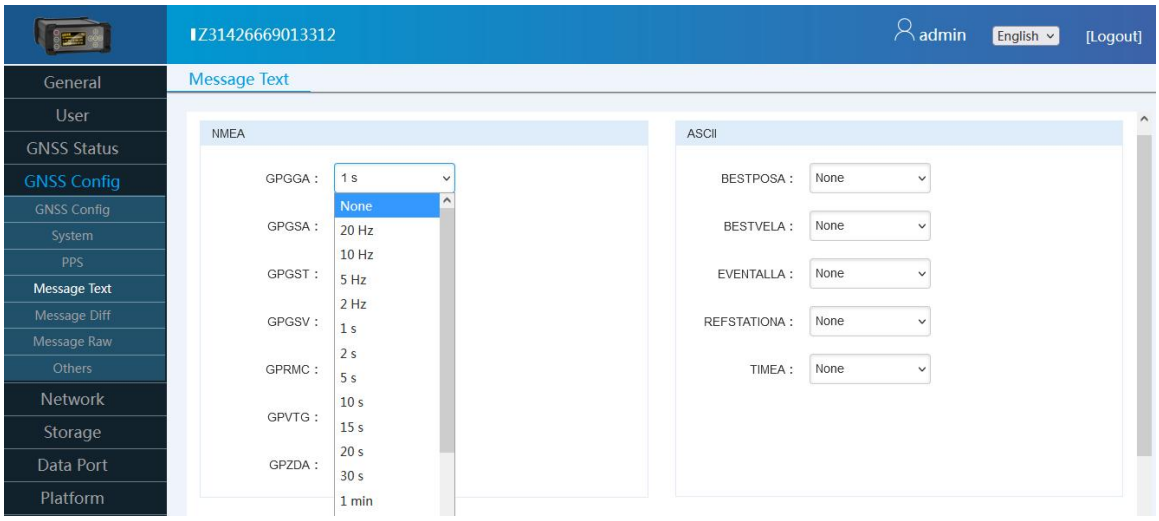


Figure 3- 27 Message Text

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:

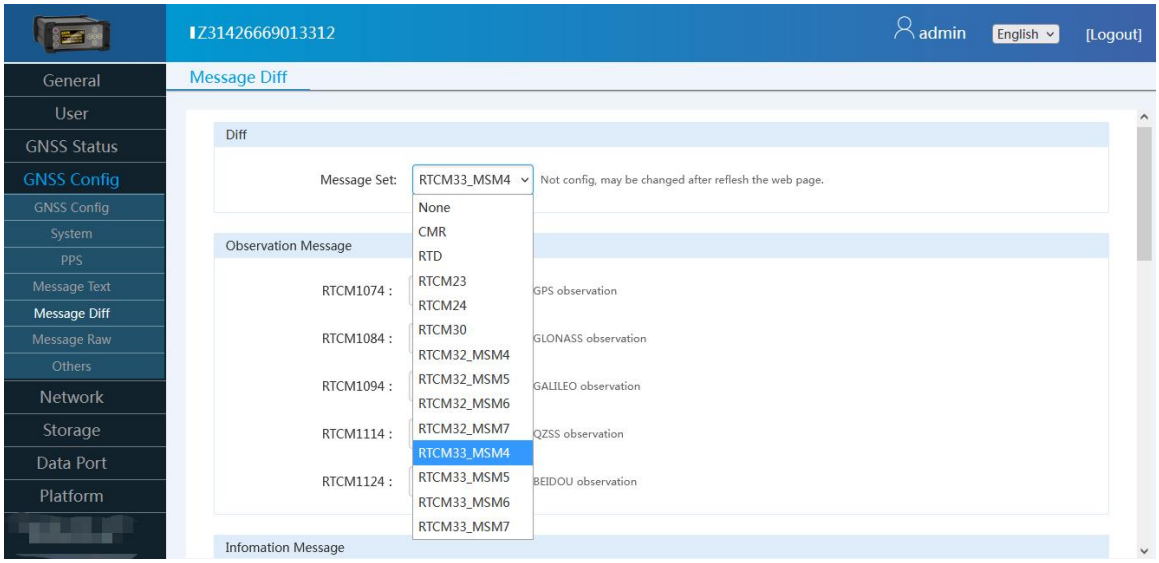


Figure 3-28 Message Diff

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:

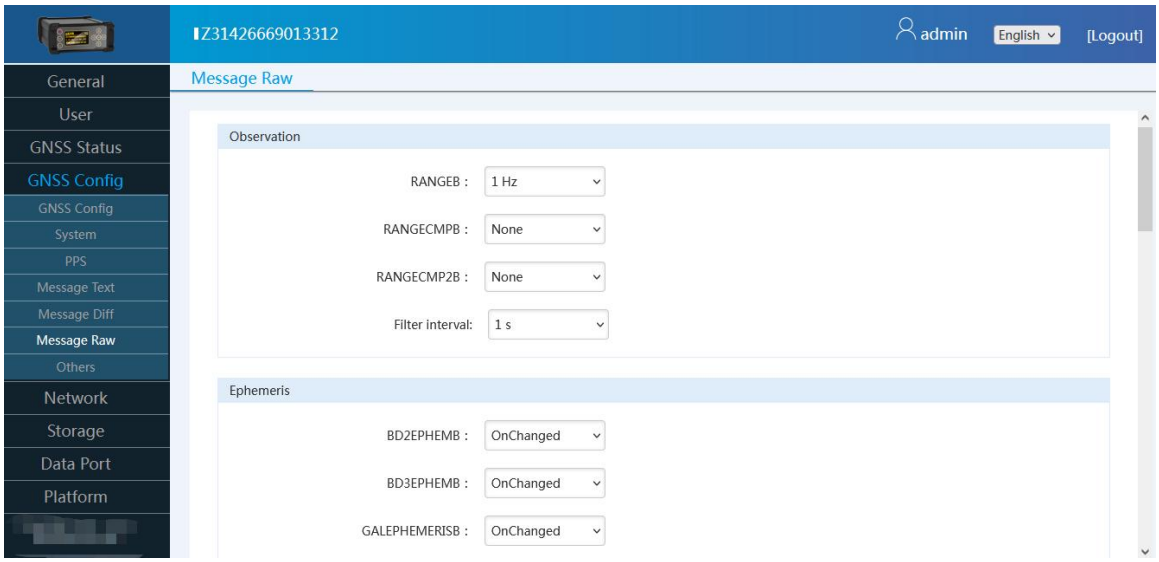


Figure 3-29 Message Raw

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:

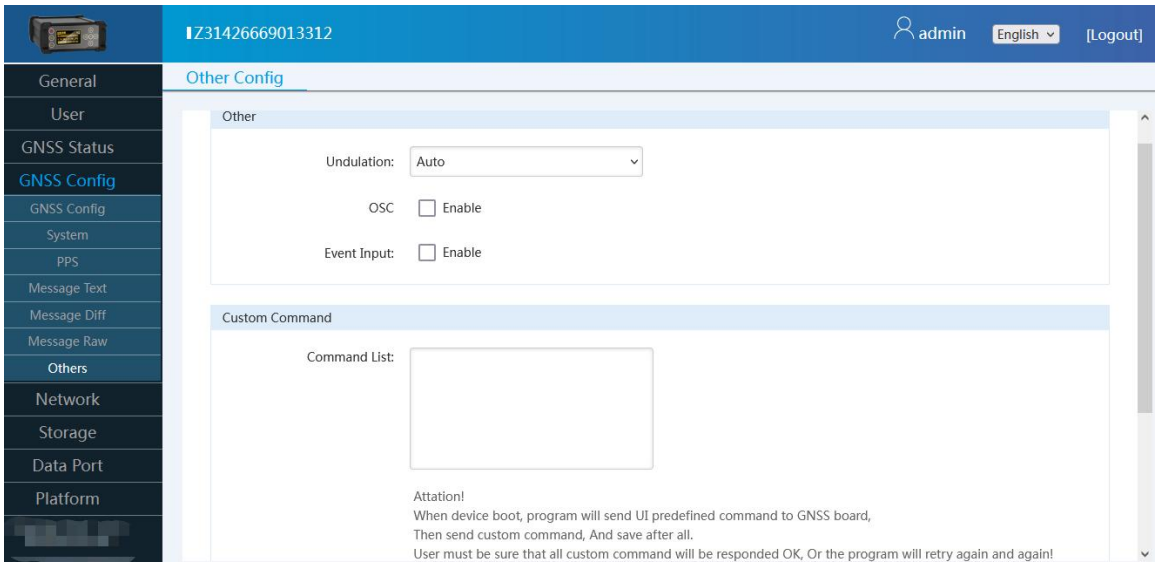


Figure 3- 30 Others

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:

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:

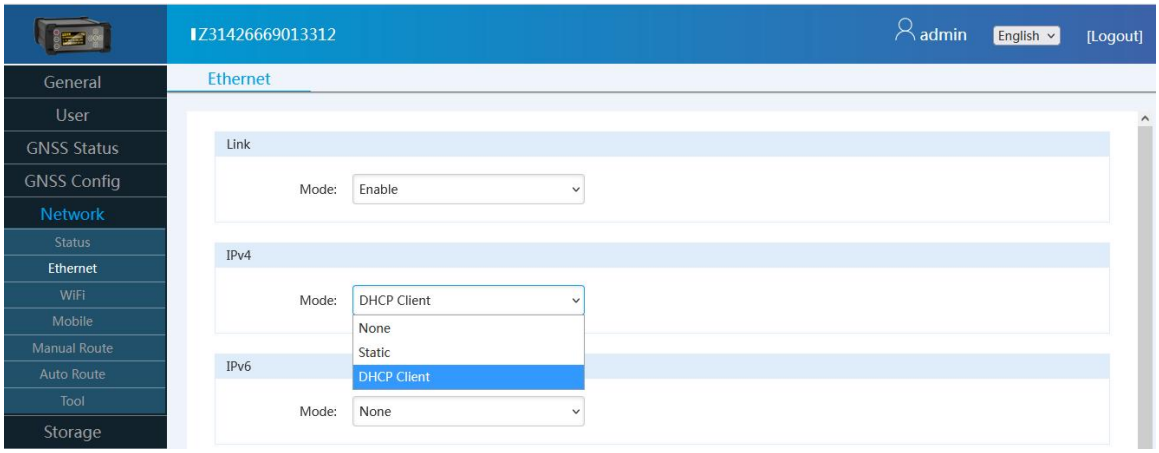


Figure 3- 32 Ethernet

3.5.3 WiFi

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

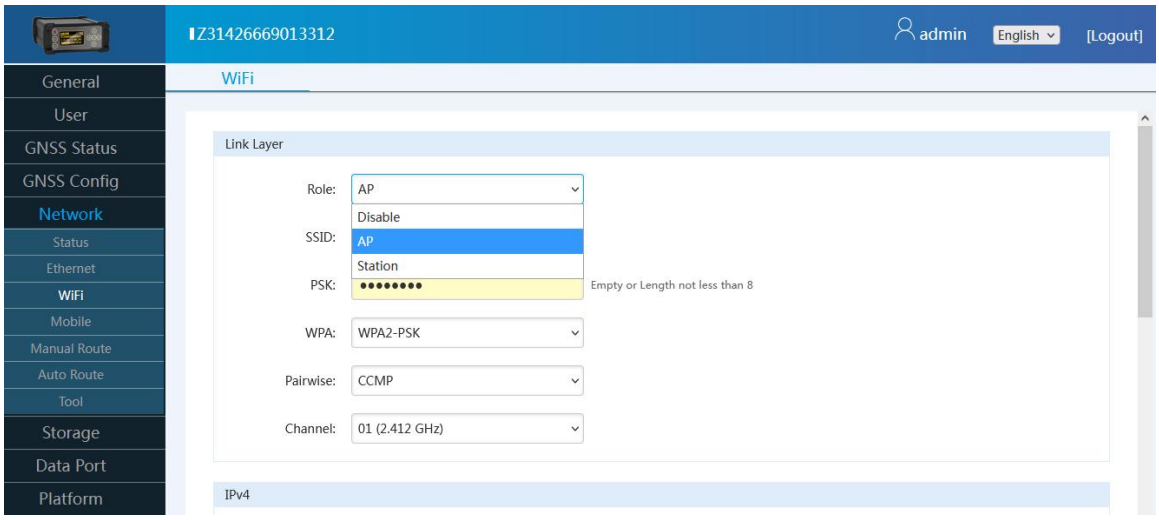


Figure 3- 33 WiFi

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:

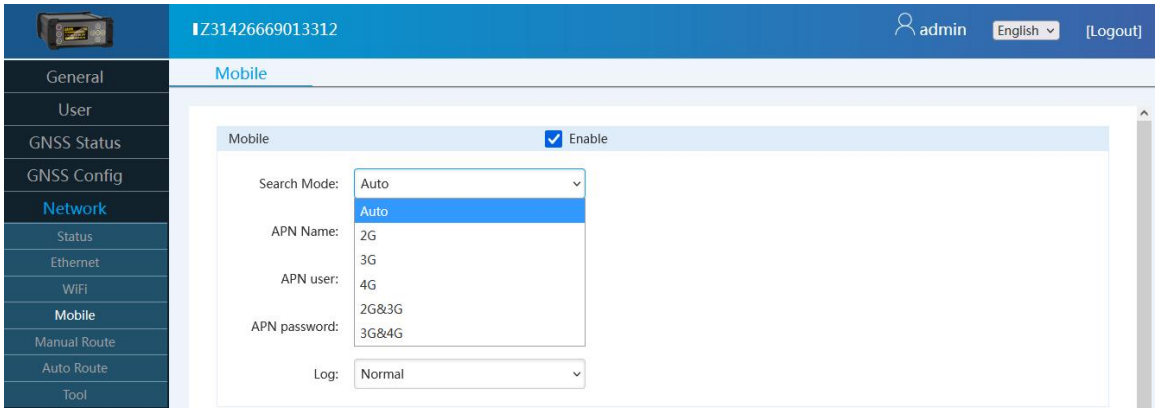


Figure 3- 34 Mobile

3.5.5 Manual Route

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

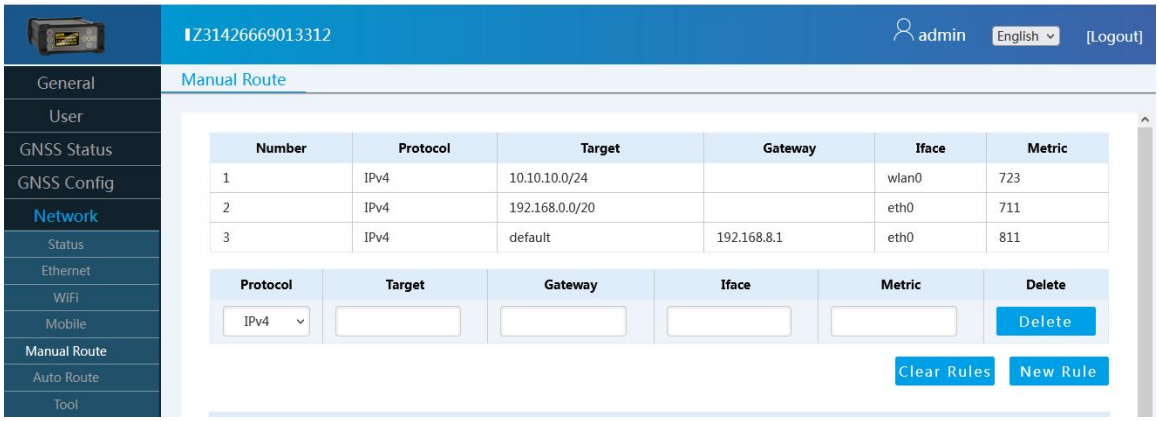


Figure 3-35 Manual Route

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:

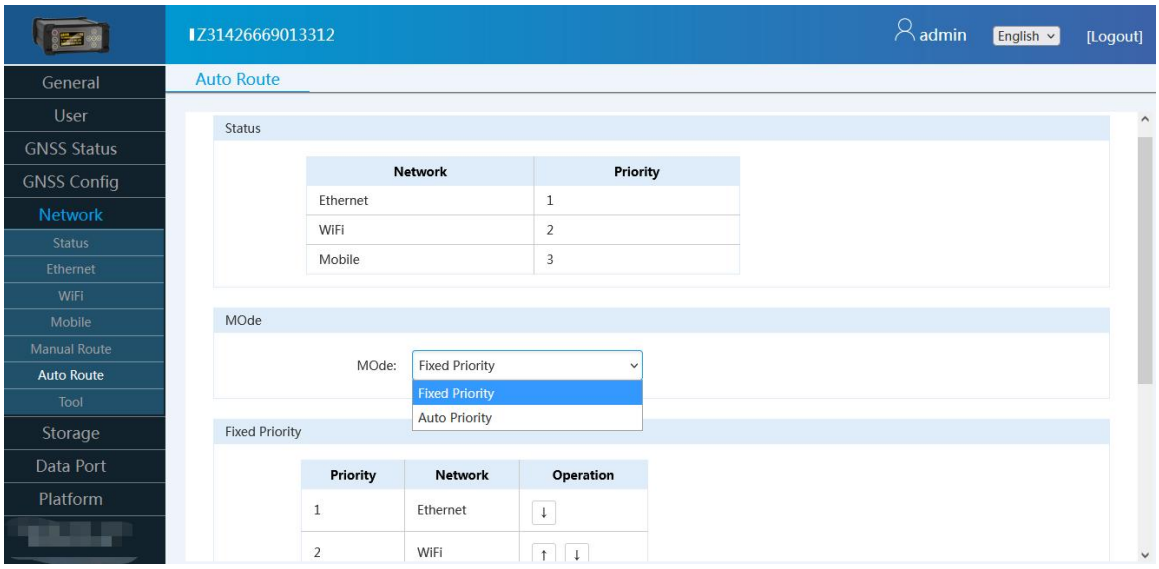


Figure 3-36 Auto Route

3.5.7 Tool

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

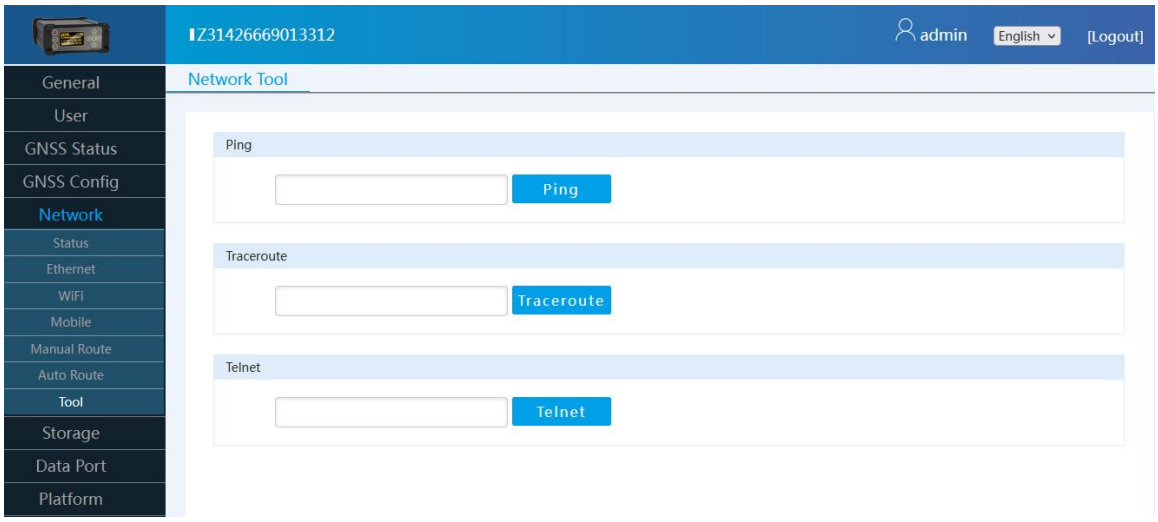


Figure 3- 37 Tool

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:

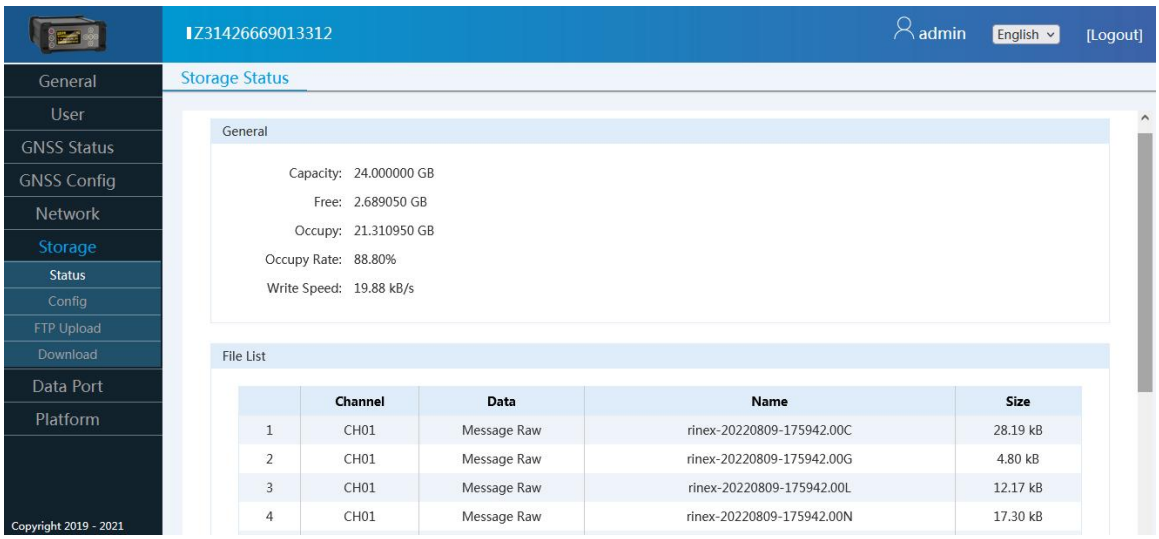


Figure 3- 36 Status

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:

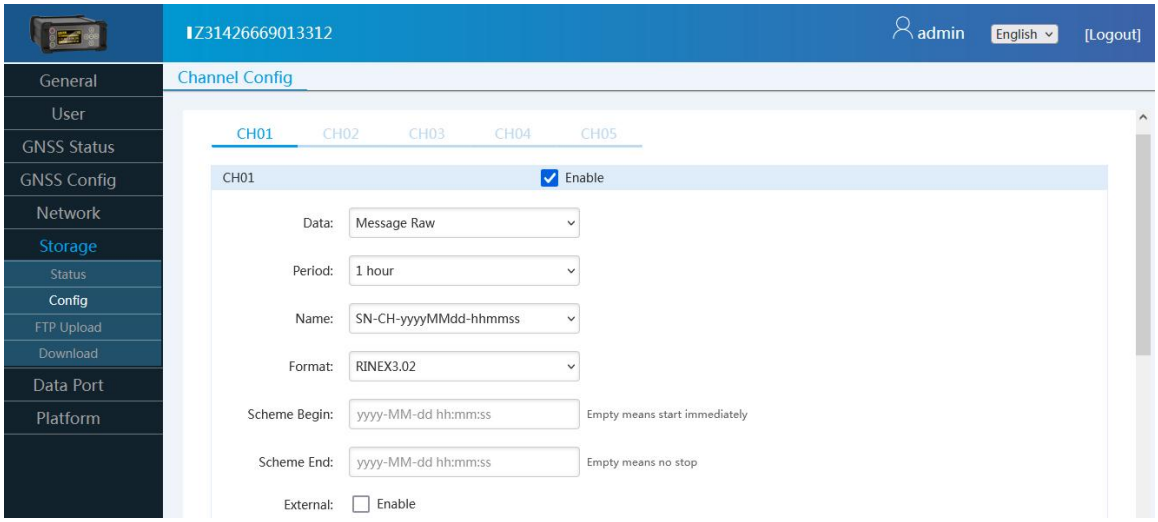


Figure 3- 37 Config

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)

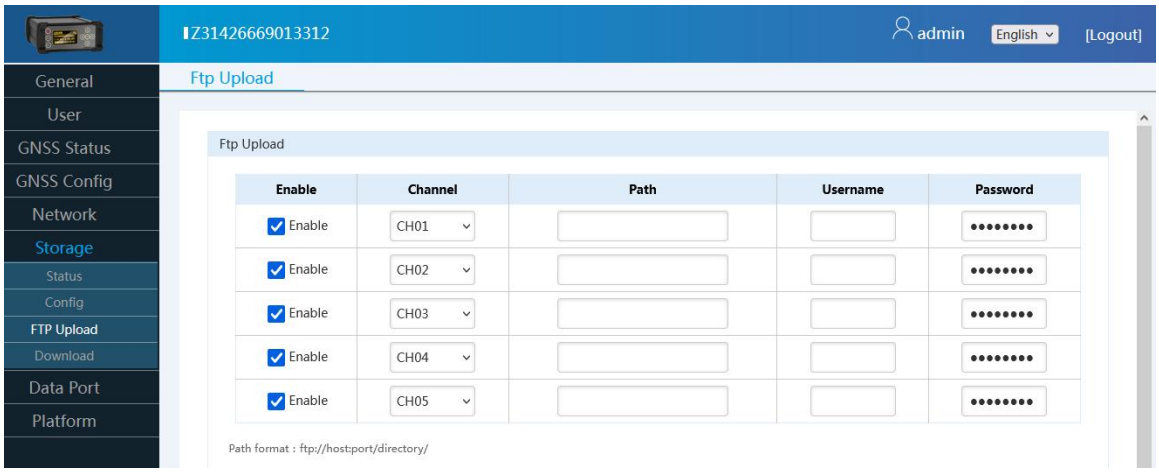


Figure 3- 38 FTP Upload

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:

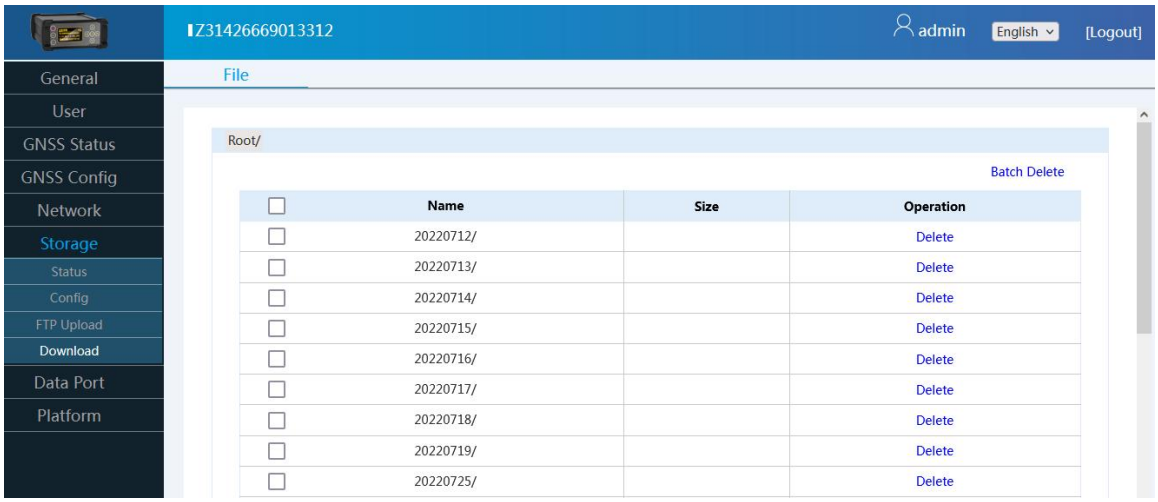


Figure 3- 39 Download

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:

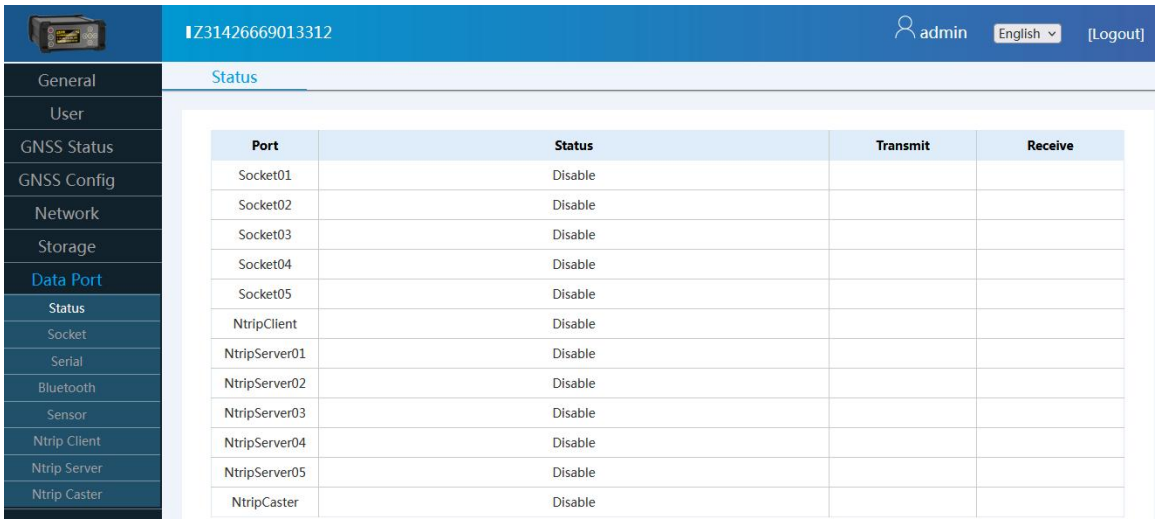


Figure 3- 40 Status

3.7.2 Socket

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

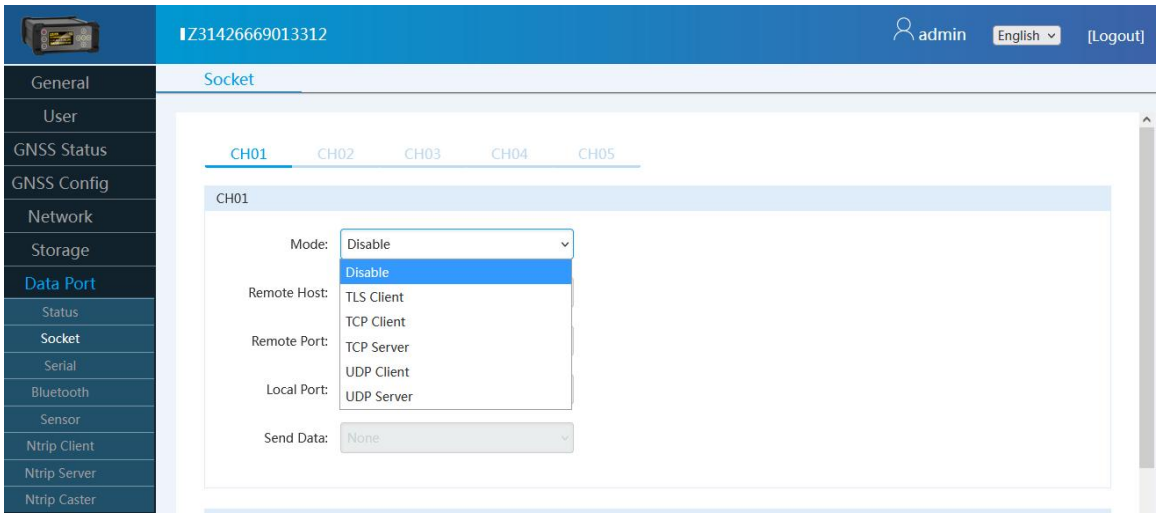


Figure 3- 41 Socket

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

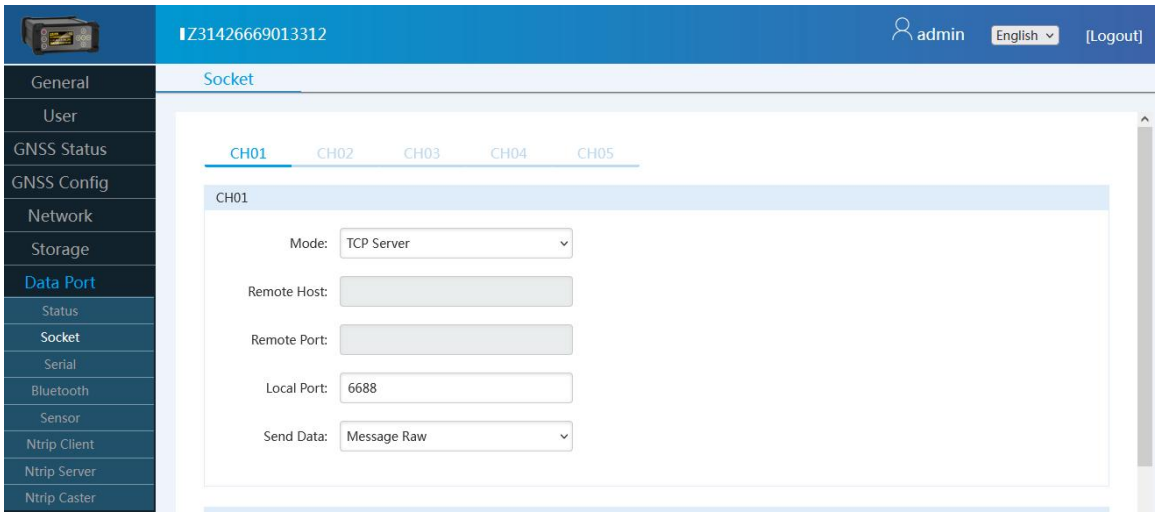


Figure 3- 42 Base Station - TCP Server

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

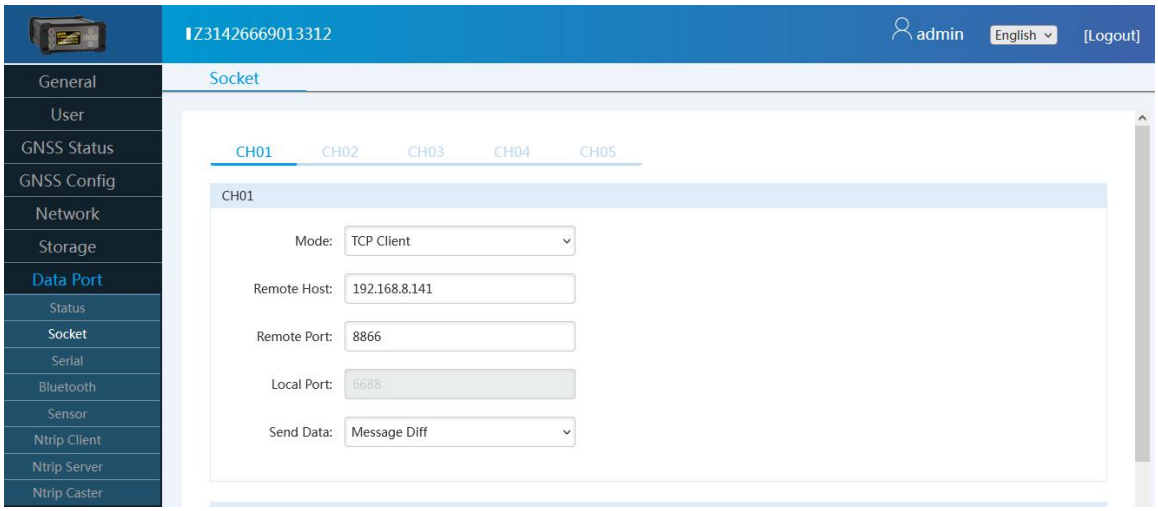


Figure 3- 43 Rover - TCP Client

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:

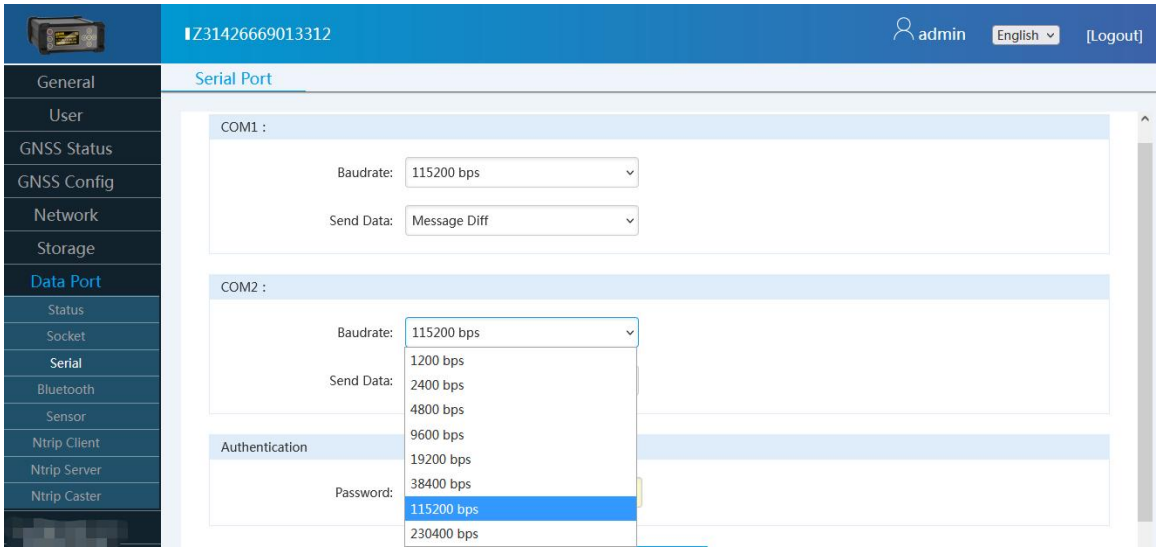


Figure 3- 44 Serial

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:

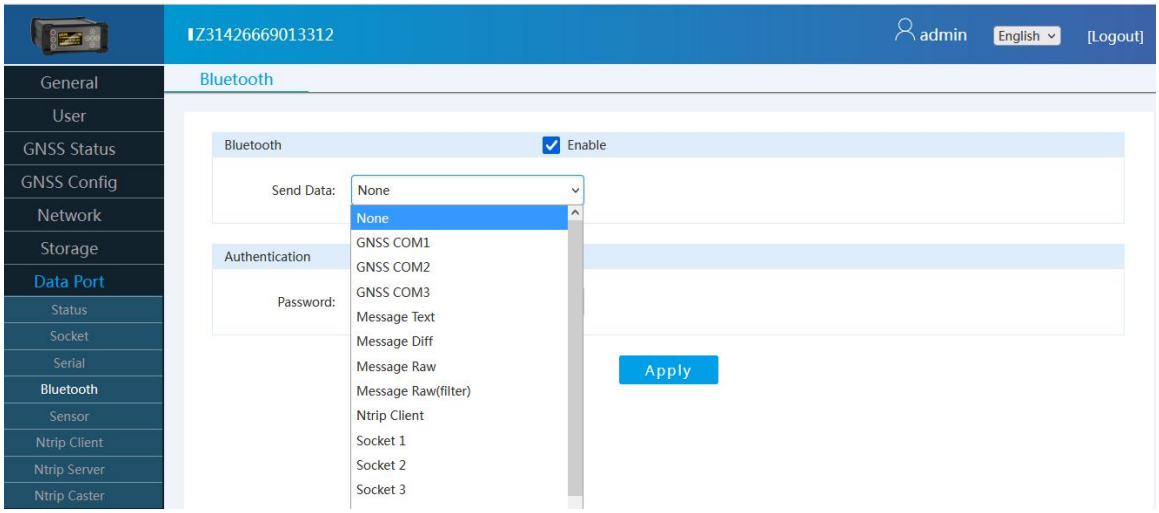


Figure 3- 45 Bluetooth

3.7.5 Sensor

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

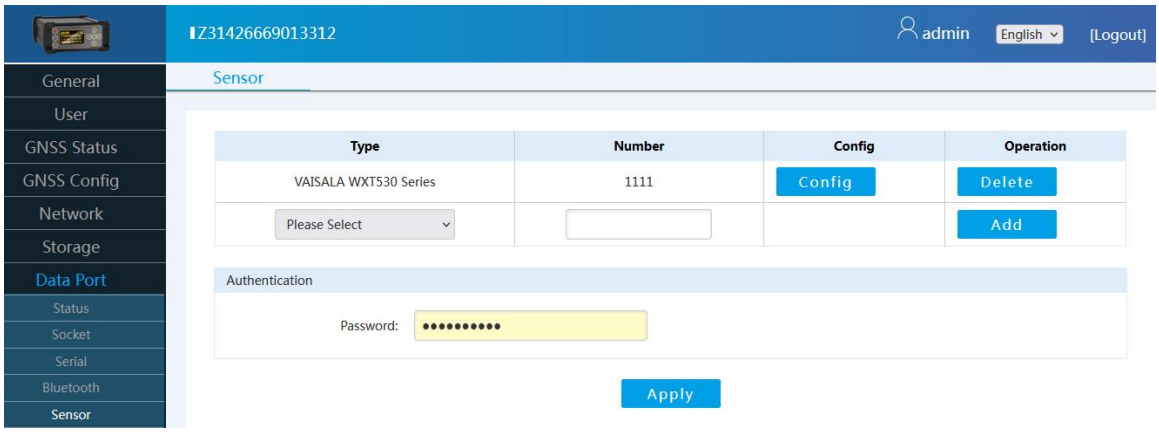


Figure 3- 46 Sensor

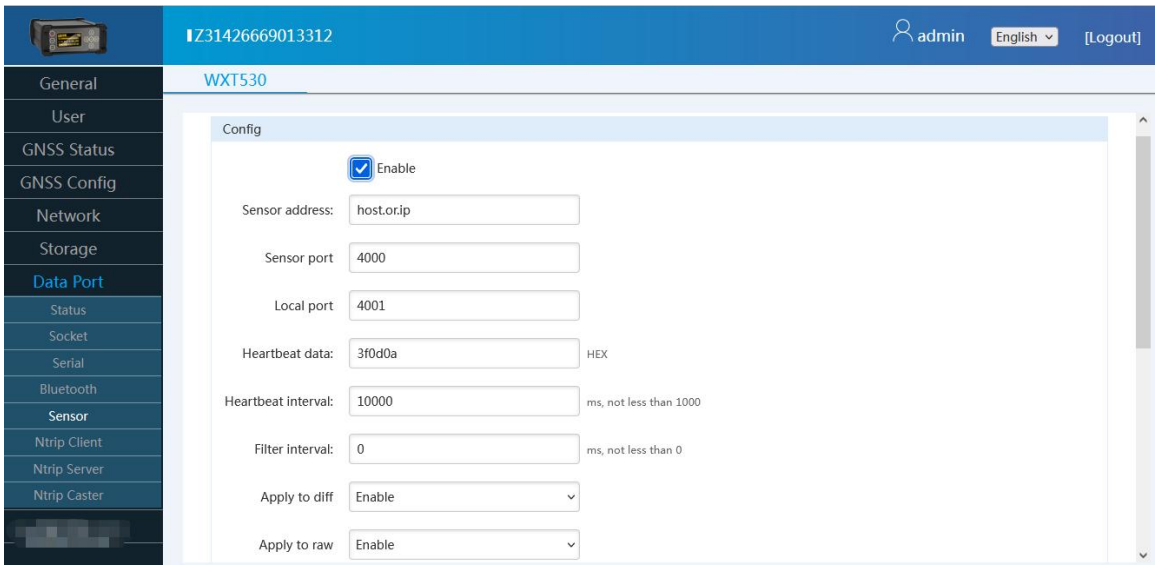


Figure 3-47 Sensor Config

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:

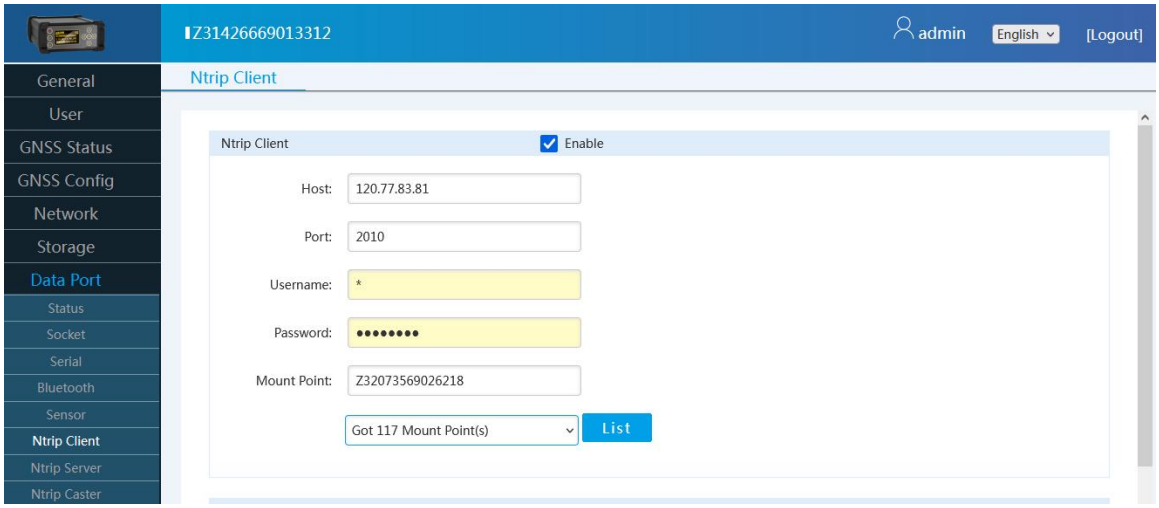


Figure 3- 48 Ntrip Client

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:

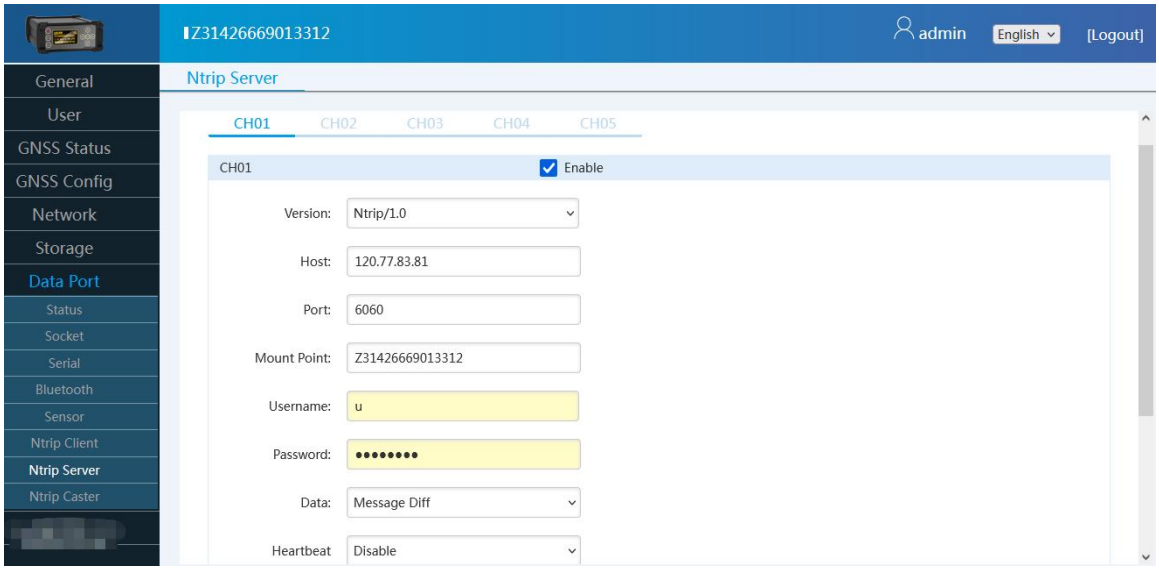


Figure 3- 49 Ntrip Server

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:

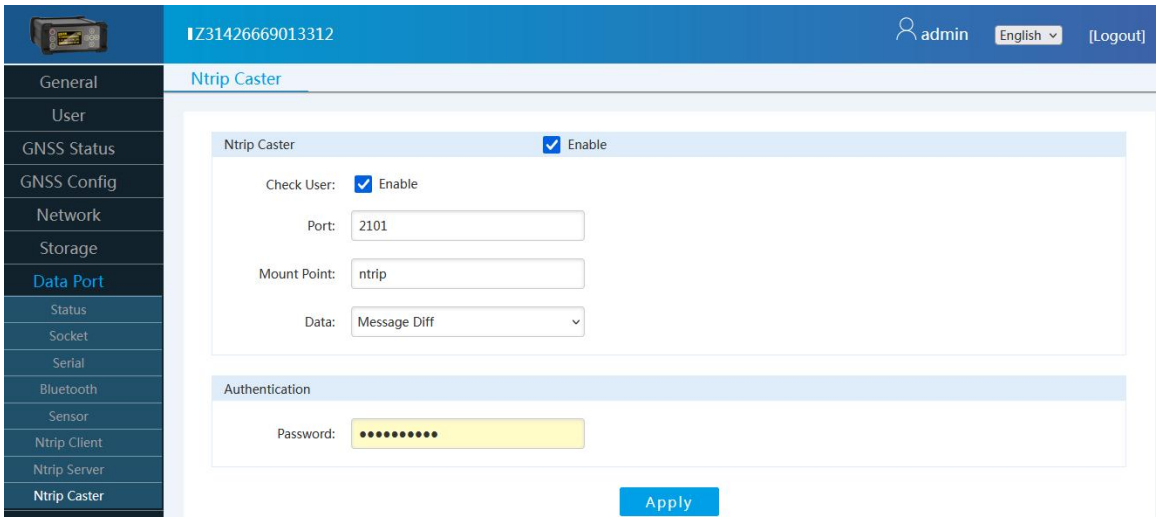


Figure 3- 50 Ntrip Caster

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:

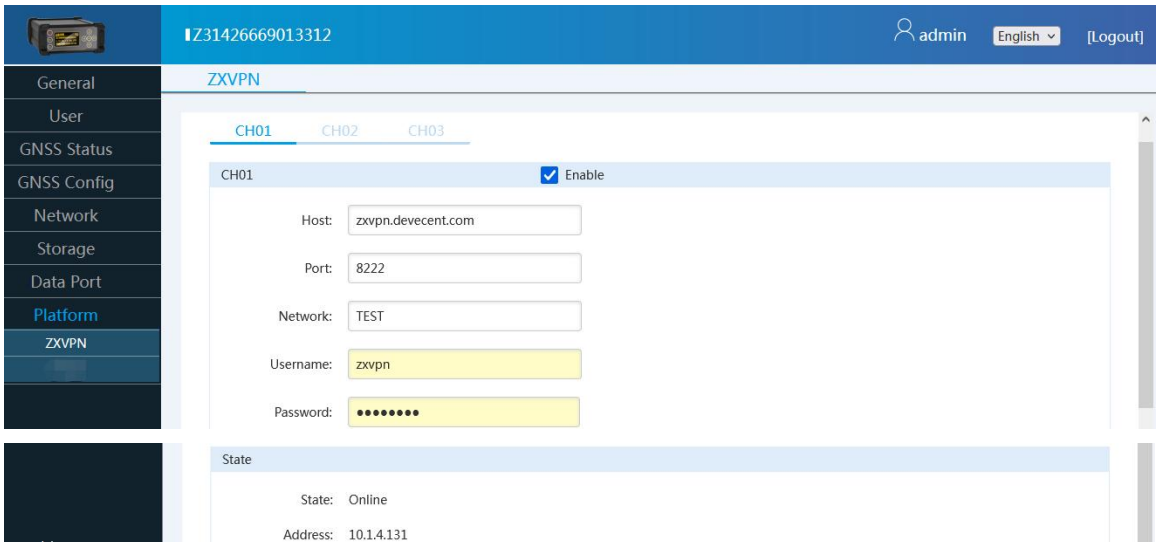


Figure 3- 51 ZXVPN

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:

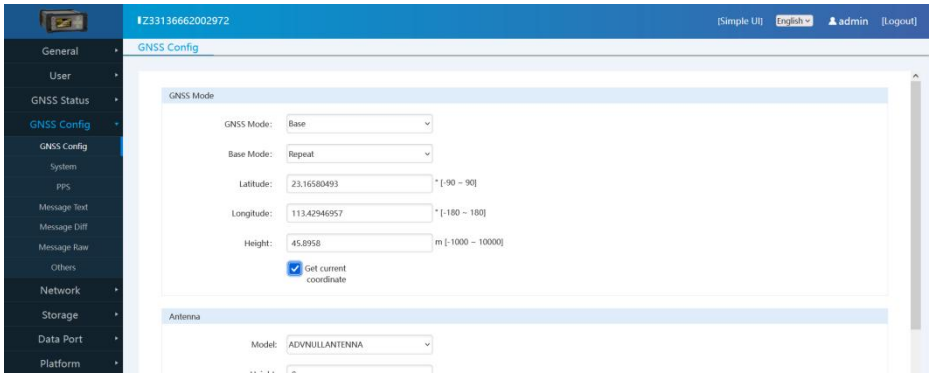


Figure 4-1 Base Station Configuration

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

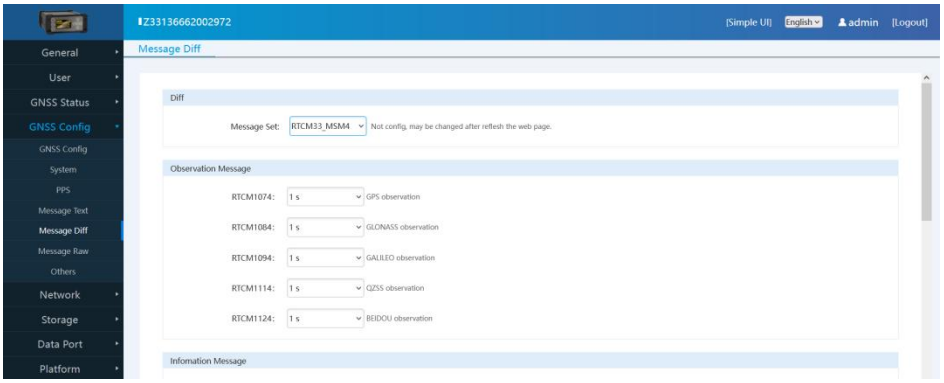


Figure 4-2 Differential Output Configuration

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:

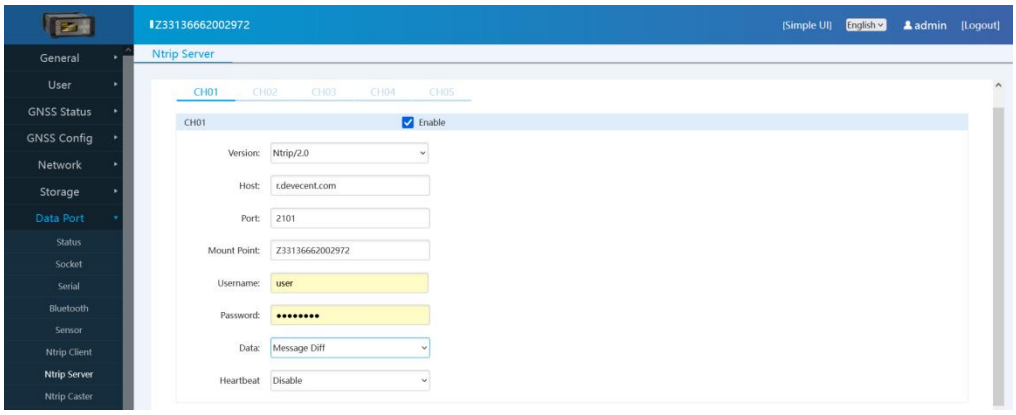


Figure 4-3 Ntrip Server Configuration

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:

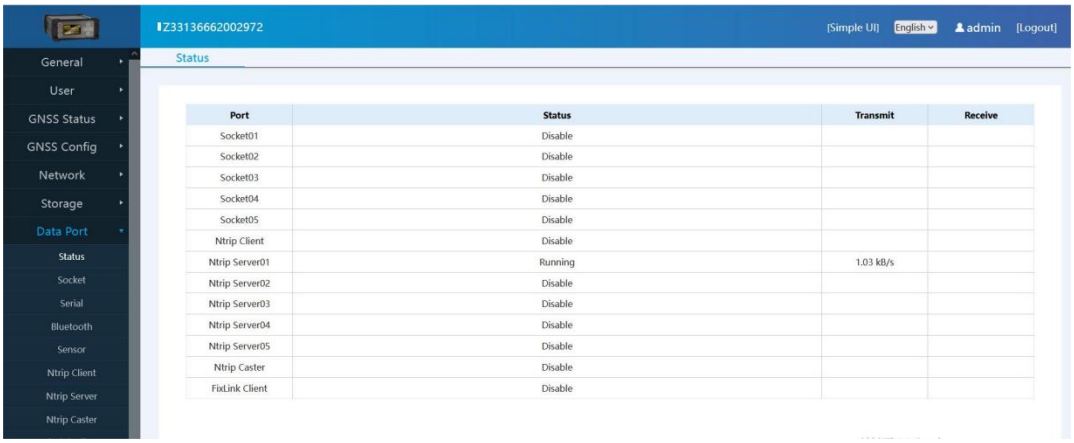


Figure 4-4 Status

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:

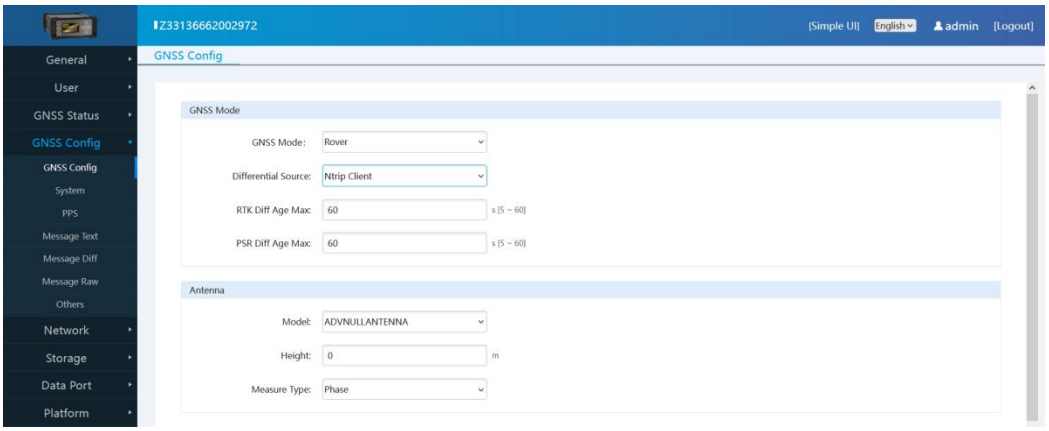


Figure 4-5 Mobile Station Configuration

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

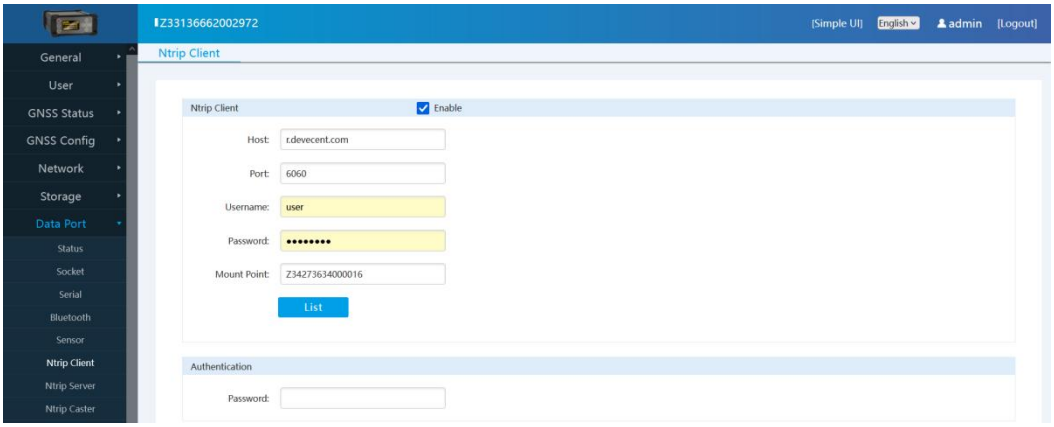


Figure 4-6 Ntrip Client Configuration

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:

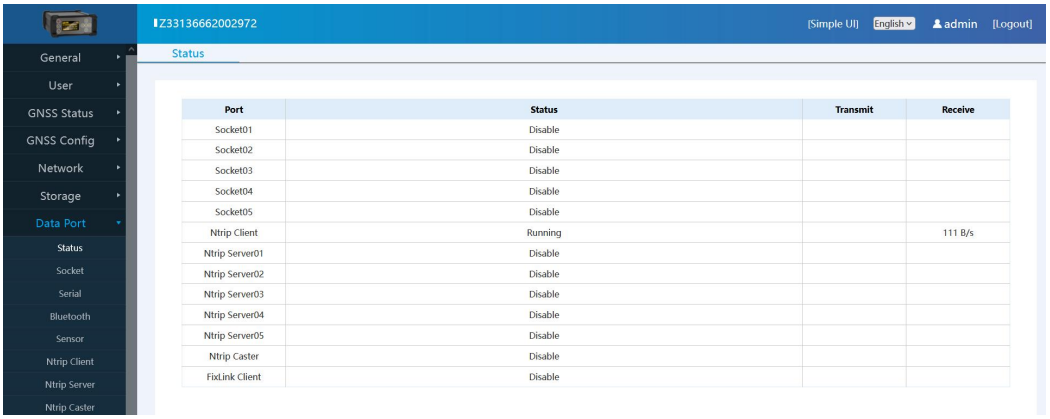


Figure 4-7 Status