

NET20 PRO



User Manual

CORS REFERENCE STATION RECEIVER
High performance

Statement

Please read carefully :

The final interpretation of this user manual belong to Geneq.

This user manual is only for your reference. If your receiver does not match the case in user manual, the actual situation of the receiver shall prevail.

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Please carefully read the notes and instructions in User Manual. In order to avoid unexpected damage, you should only use original supplied parts. If you do not use the system with the correct procedure or connect incompatible accessories, cause the equipment damage and may even endanger other person and your safety. In this regard, the Company does not assume any responsibility.

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1 Technical Specification

1.1 Overview

NET20 PLUS is a high-precision CORS reference station receiver. LINUX system as its development platform, and it support for secondary development. It has powerful and stable function, and can be used in many fields.

1.2 Main features

- 555 channels with Multi-constellation GNSS support.
- Superior carrier phase observations of less than 1mm accuracy.
- Internal battery for more than 20 hours operation.
- 4G LTE and Bluetooth / WLAN datalink support.
- Easy configuration from Web UI and remote server.
- NTRIP server/caster support.

1.3 Technical Specification

1.3.1 Physical

- Weight: 2 KG
- Dimension: 222mm*164mm*79mm

1.3.2 Environmental

- (1) Operating temperature: -30°C-60°C
- (2) Storage temperature: -40°C-80°C
- (3) Humidity: 0%-100% non-condensing

1.3.3 Electrical

- (1) Input: 9-28V
- (2) Power: 2.8W

1.3.4 GNSS

- (1) Channels: 555
- (2) Tracking signals:
 - GPS: L1 C/A, L1C, L2C, L2P, L5
 - GLONASS: L1 C/A, L2C, L2P, L3, L5
 - BeiDou: B1, B2, B3
 - Galileo: E1, E5 AltBOC, E5a, E5b, E6
 - IRNSS: L5
 - SBAS: L1, L5
 - QZSS: L1 C/A, L1C, L2C, L5, L6
 - L-Band up to 5 channels
- (3) Positioning accuracy

Table 1-1 Positioning accuracy

Positioning mode	Accuracy	
	Horizontal	Vertical
Static	5mm	10mm
RTK	1cm + 1ppm	2cm + 1ppm

- (4) initialization time: < 10s
- (5) initialization reliability: > 99.9%

1.3.5 Ports

- (1) 3 RS232 serial ports(DB9 and 2 LEMO 5pin).
- (2) 1 RJ45 Ethernet port.
- (3) 1 power port.
- (4) 1 USB port.
- (5) 1 4G LTE antenna port.
- (6) 1 UHF antenna port.(Optional)
- (7) 1 EVENT port.
- (8) 1 1PPS port.
- (9) 1 SIM card slot.
- (10) 1 GNSS antenna port.

1.3.6 Data and Storage

- (1) Output data format: NMEA-0183, binary, RINEX, RTCM2.x, RTCM3.x
- (2) Internal memory: 32G
- (3) External storage: 32G

2 Hardware Structure

2.1 Receiver appearance



Figure 2-1

2.1.1 Front panel



The front panel of NET20 PLUS receiver includes seven buttons, four LED indicators, and one OLED display.



Figure 2-2

After switching **ON** NET20 PLUS receiver, current time information, GPS status displayed in the main interface. The default language is English, and you can press the left and right arrow keys to obtain the current IP information.

Table 2-1 Function table

Name	Function
F1	Save the current setup and return to the previous menu
F2	Enter the main menu
	Move the cursor up and down, modify parameters when entering modify items
	Move the cursor left and right
Power key	Switch on/off the receiver and confirmation key
Power Off	Press once until "Shut Down", press second time
Bluetooth indicator	It will be light blue when NET20 PLUS is connected via Bluetooth
Differential transmission indicator	When the differential data output, the differential indicator blinks evenly at 1-second interval
Static recording indicator	When start static recording, static recording indicator blinks evenly at 1-second interval
Power indicator	After switching on NET20 PLUS receiver, the power light is normal on

2.1.2 Back panel

NET20 PLUS receiver provides a variety of communication interfaces to facilitate users in different application scenarios.

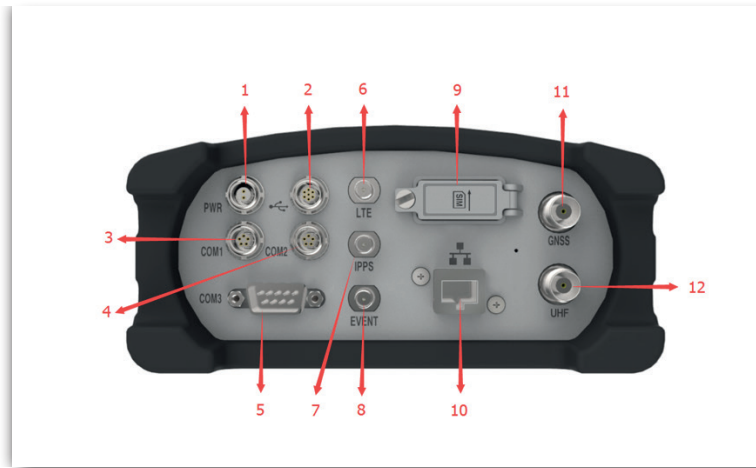


Figure 2-3 Back panel

Table 2-2 Interface function table

No.	Name	Function
1	PWR	Receiver power supply interface, input voltage DC 9V-28V.
2	USB	USB interface
3	COM1	RS232 serial port
4	COM2	RS232 serial port(Optional RS485 serial port)
5	COM3	DB9 serial port
6	LTE	GPRS antenna interface
7	1PPS	1 Pulse Per Second output
8	EVENT	EVENT input
9	SIM	Standard size SIM card interface
10	RJ45	Wired Ethernet port
11	GNSS	GNSS External receiver antenna connector
12	UHF	UHF External receiver antenna connector

Note :

The UHF interface is replaced by the OSC interface in the NET20 PLUS.

2.2 Structural drawings / mounting dimensions

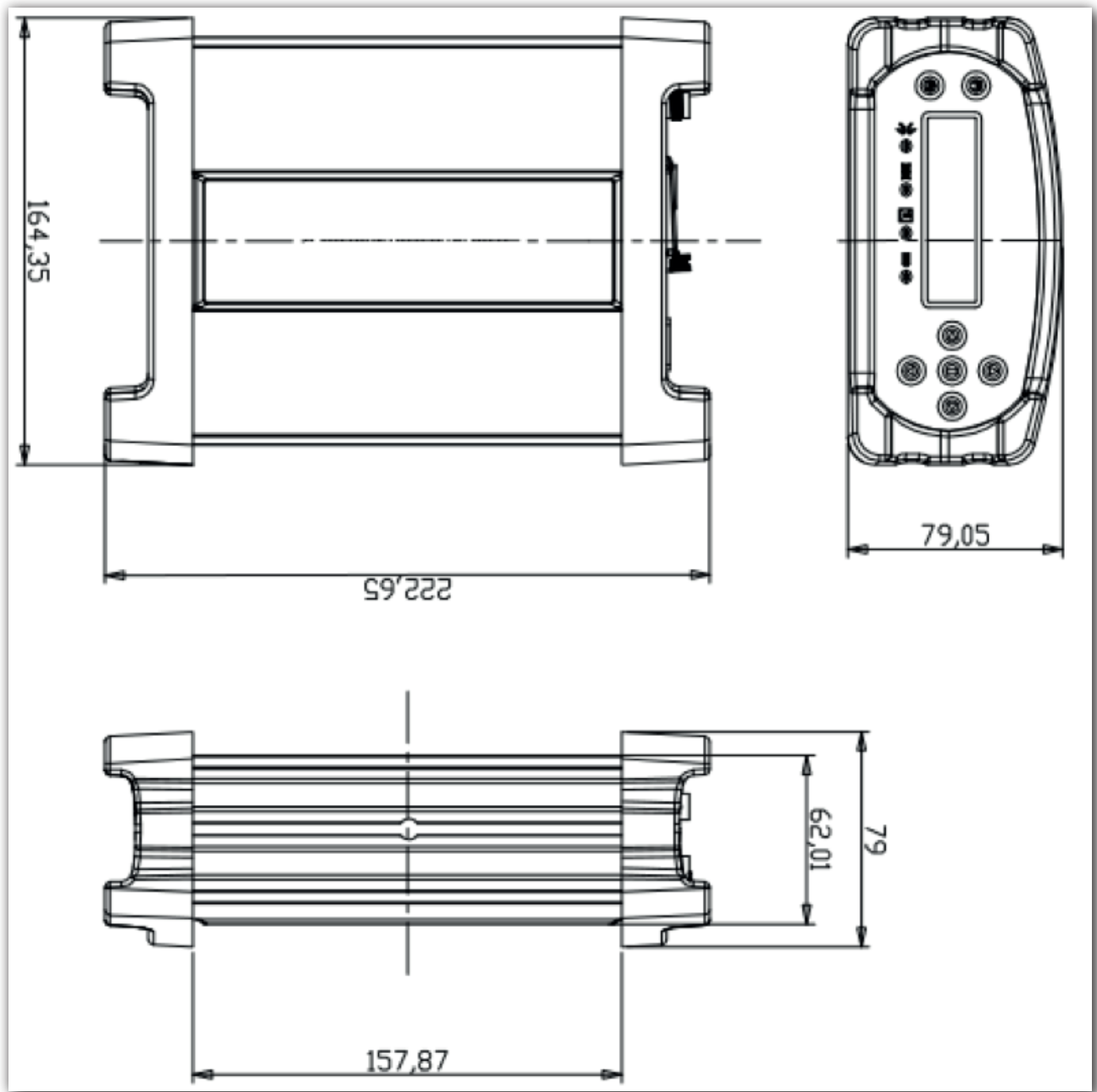


Figure 2-4

3 WEB UI

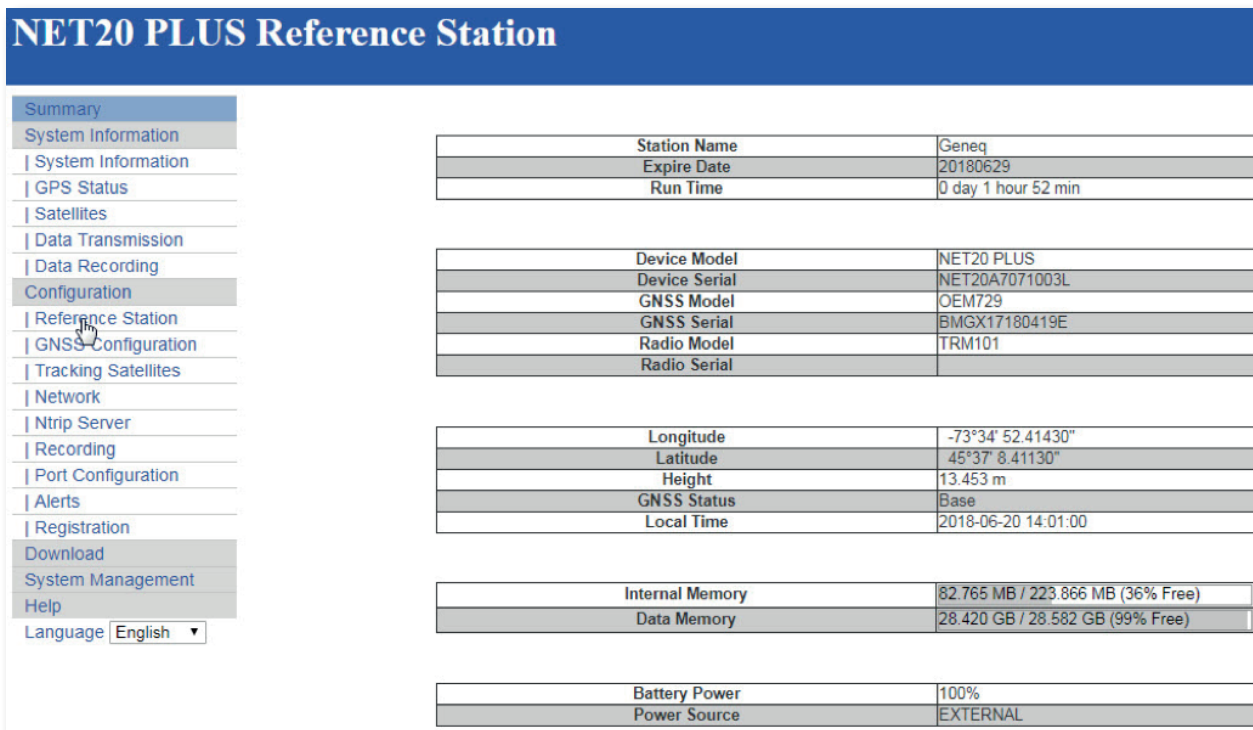
There are two ways to login the WEB interface, which are Ethernet port login and WIFI login. The WEB interface content of the two login modes is same.

(1) Ethernet port login: Connect the RJ45 network port with the computer host, and enter the IP on the NET20 PLUS display in the browser for NET20 PLUS access. Enter the user name and password in the pop-up dialog box, and the default username and password are: admin - password.

(2) WIFI login: When NET20 PLUS opens WIFI hotspot, the user can login the browser by connecting the WIFI. The hotspot name is the serial number of the fuselage. Enter the IP address: 192.168.10.1. A window will pop up when the user log in, which need to fill in the account and password, and the default username and password is admin: password.

3.1 Summary

After authentication information to log into the web interface of NET20 PLUS. Home page contents Reference information, device version, system version, network parameters, memory status and so on. It is shown as below:



NET20 PLUS Reference Station	
Summary	
System Information	
Station Name	Geneq
Expire Date	20180629
Run Time	0 day 1 hour 52 min
Device Model	
Device Model	NET20 PLUS
Device Serial	NET20A7071003L
GNSS Model	OEM729
GNSS Serial	BMGX17180419E
Radio Model	TRM101
Radio Serial	
Location	
Longitude	-73°34' 52.41430"
Latitude	45°37' 8.41130"
Height	13.453 m
GNSS Status	Base
Local Time	2018-06-20 14:01:00
Memory	
Internal Memory	82.765 MB / 223.866 MB (36% Free)
Data Memory	28.420 GB / 28.582 GB (99% Free)
Battery	
Battery Power	100%
Power Source	EXTERNAL

Figure 3-1

Note: The effect of different browsers display may be slightly different, recommend using Google Chrome or IE.

3.2 System Information

3.2.1 System Information

In the system information screen will display the station name, device model, body number, system version, application version information, built-in OEM board models, and network parameter information.

NET20 PLUS Reference Station

Summary	
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System Information	
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Configuration	
Reference Station	
GNSS Configuration	
Tracking Satellites	
Network	
Ntrip Server	
Recording	
Port Configuration	
Alerts	
Registration	
Download	
System Management	
Help	
Language English	

Station Name	Geneq
Expire Date	20180629
Time Zone	GMT-05:00

Device Model	NET20 PLUS
Device Serial	NET20A7071003L
IMEI	868323029672737
Hardware Version	NSC200-V4.00-RS485
BOOT Version	1.03
OS Version	4.1.6-1.07(170803)
APP Version	2.12(170815)
Web Version	2.12

GNSS Model	OEM729
GNSS Serial	BMGX17180419E
GNSS Hardware Version	OEM729-2.01
GNSS Firmware Version	OM7MR0200RN0000

Radio Model	TRM101
Radio Serial	
Radio Firmware Version	0.1
Radio Channel	2 [460.250 MHz, H]
Radio Protocol	South 9600

Figure 3-2

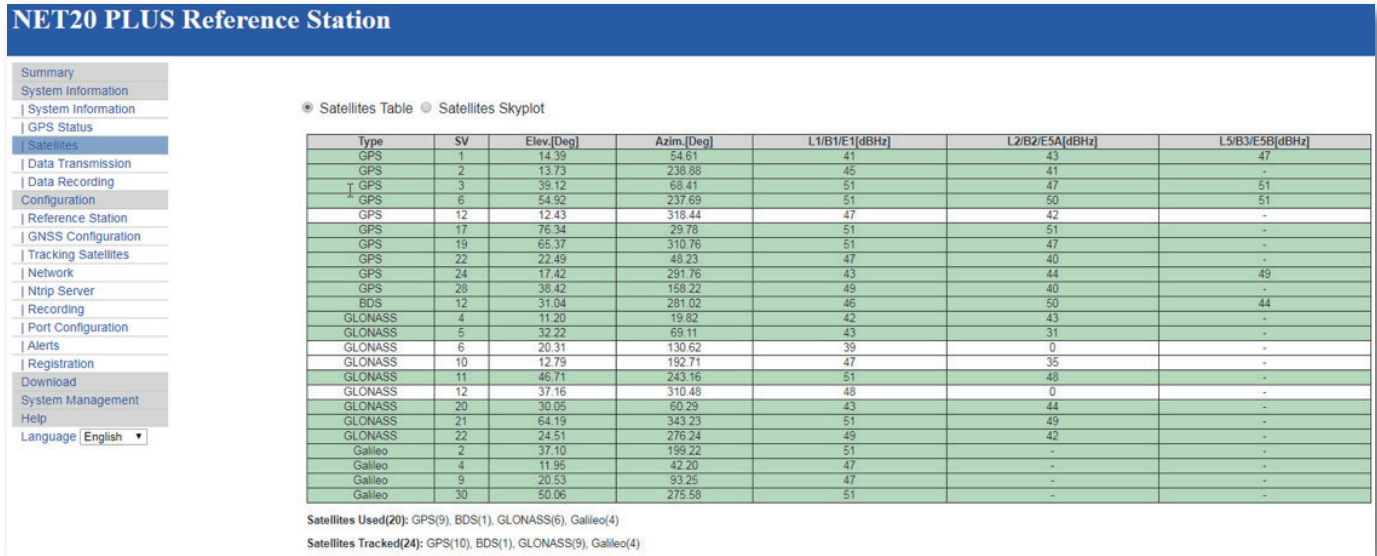
3.2.2 GPS Status

Status page displays the current NET20 PLUS positioned state, the base station coordinates and antenna type usage.

3.2.3 Satellites

This page shows the satellite signal-to-noise ratio of the current search, elevation mask angle, azimuth and other information. The information of GPS, BEIDOU, Galileo and GLONASS are displayed separately.

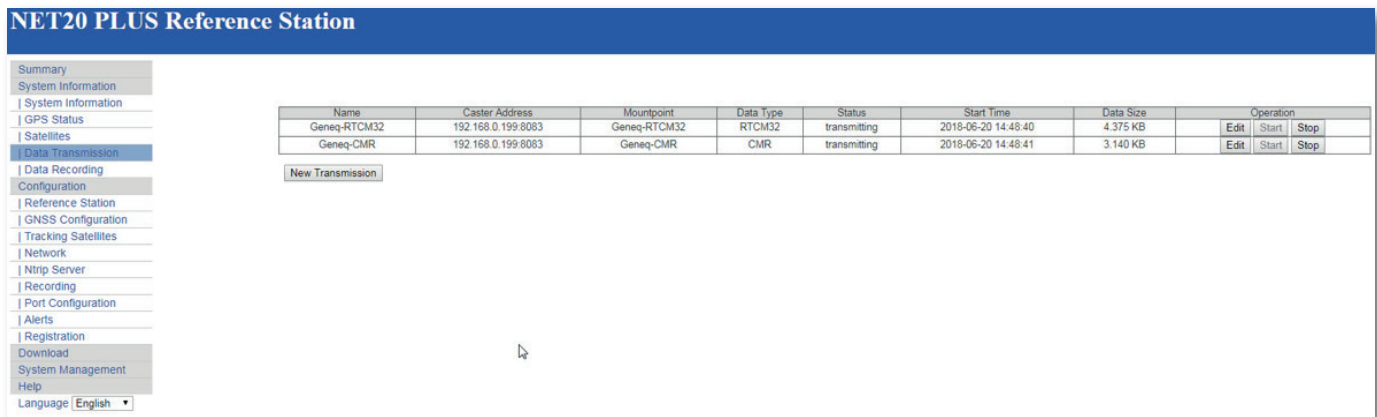
Figure 3-4



3.2.4 Data Transmission

After setting up the data transmission, the user can see the current data transfer status on the page as shown in figure 3-5. Click [Edit] to directly jump to [Ntrip Server].

Figure 3-5



3.2.5 Data Recording

In this page, the user can see the specific data record information as shown in figure 3-6. Click [Edit], the user could modify the parameters like path type, file name, interval, duration time, etc. As shown in figure 3-7.

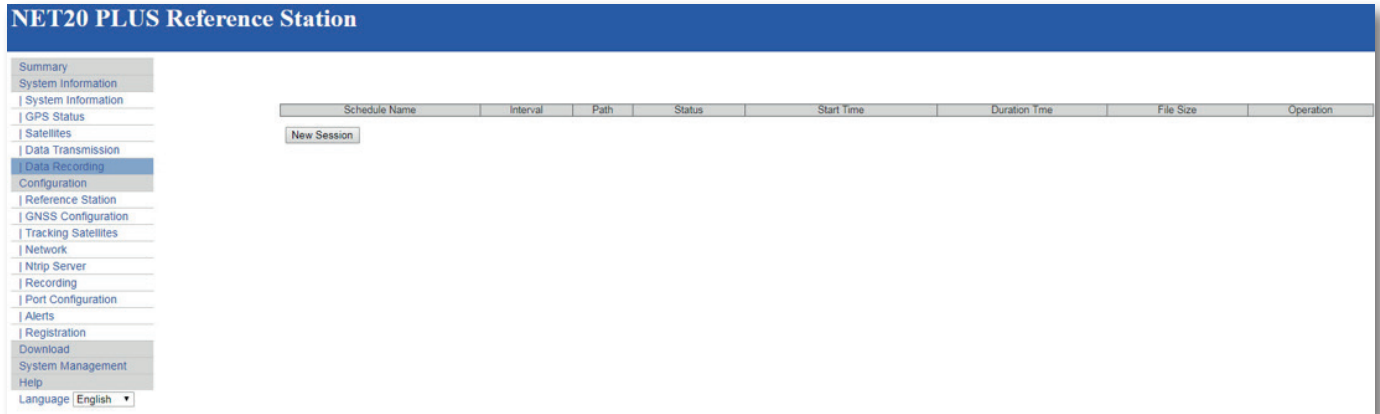


Figure 3-6

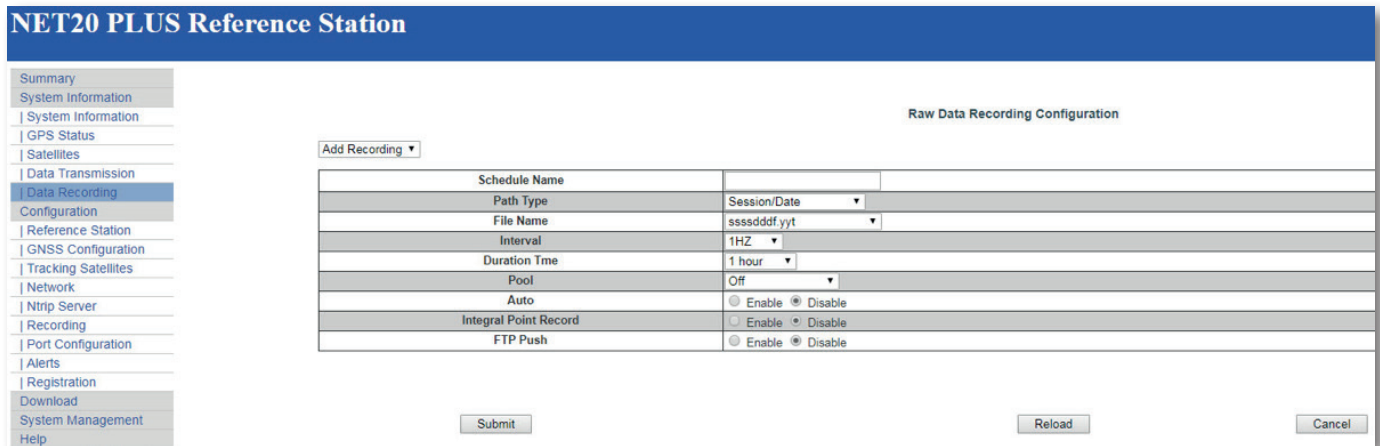


Figure 3-7

3.3 Configuration

3.3.1 Reference Station

This page mainly sets the reference station, antenna, and reference station parameters, as shown in figure 3-8.

NET20 PLUS Reference Station	
Station Name	Geneq
Marker Number	5
Receiver Number	1
Time Zone	GMT-05:00
HTTP Server Port	80
Antenna Height(mm)	0
Measurement Mode	Antenna Phase Center
Antenna Type	HX-GG486A
R(mm)	0
H(mm)	0
HL1(mm)	116
HL2(mm)	142
Coordinate System	Geodetic Coordinates (B.L.H)
Base Longitude	-73 34 52
Base Latitude	45 37 8
Base Height	13.453
Height of the point on the ground	13.453

Figure 3-8

Reference station coordinates: If you do not need a known coordinate to start reference station, then click the “Load Current Position” as a reference station coordinate. However, if you need a known coordinate to start reference station, please input the known point coordinates in accordance with the appropriate format. The web access port is 80. After setting mapping in the router device, then you can access the NET20 PLUS by Internet.

3.3.2 GNSS configuration

This page is mainly set for the satellite systems and the cutoff angle, as shown in figure 3-9.

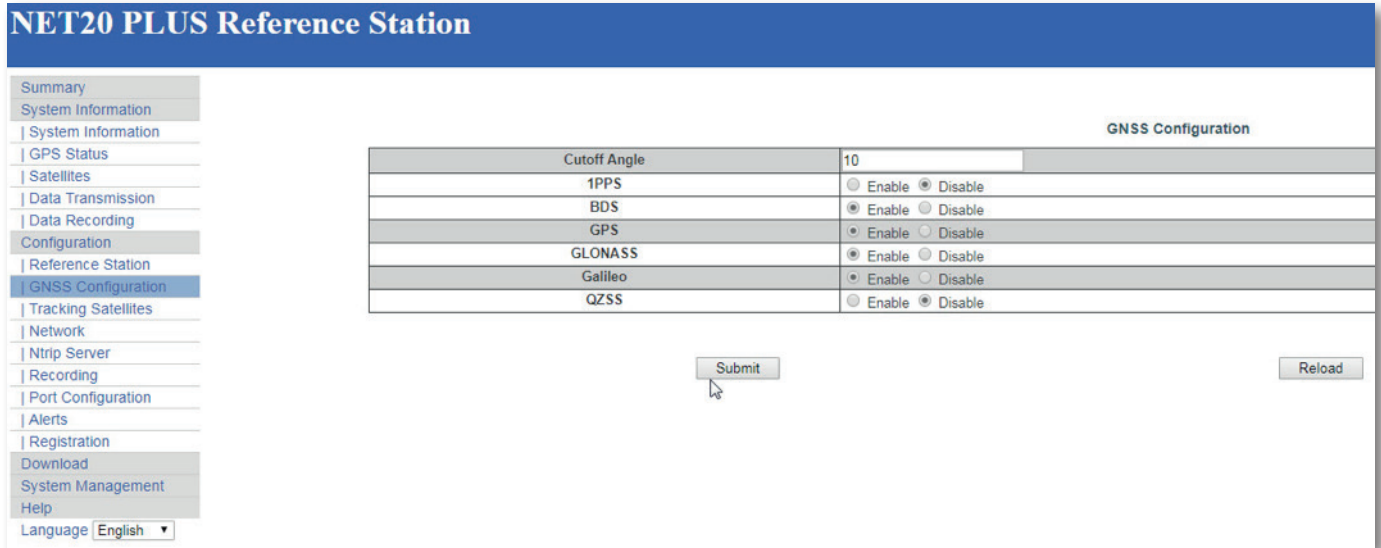


Figure 3-9

3.3.3 Tracking satellites

In this page, the user can select the satellites they want to track, as shown in figure 3-10.

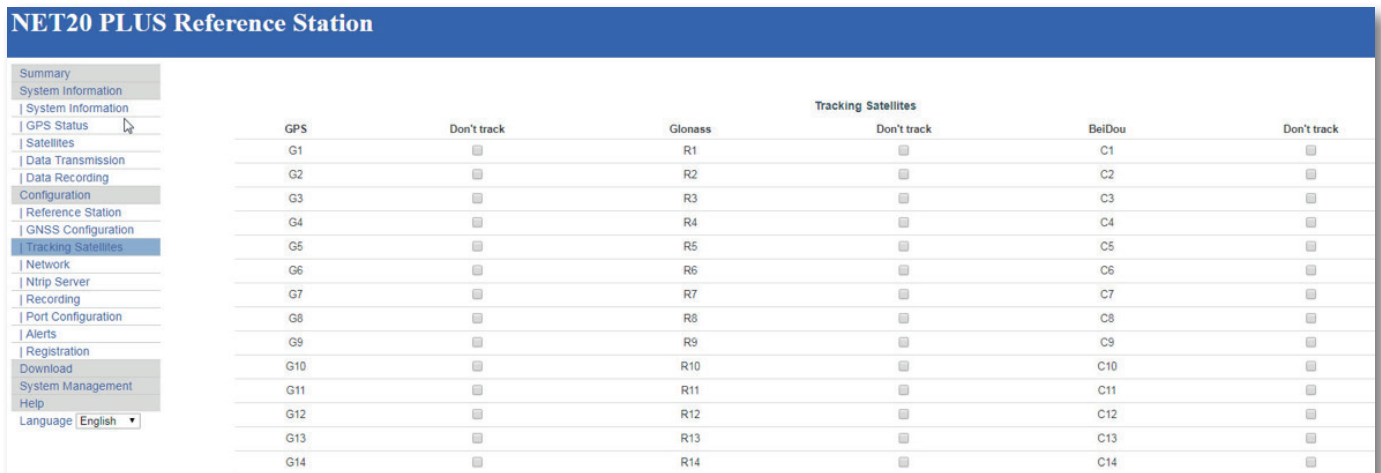


Figure 3-10

3.3.4 Network

This page is mainly set for the data link method used by NET20 PLUS, as shown in figure 3-11.

DHCP : If the model DHCP is enable, the NET20 PLUS receiver will auto get IP address, otherwise it uses the static IP.

WIFI hotspot : After power on WIFI hotspot, then you can use other devices with WIFI function to search and connect to this NET20 PLUS receiver. The hotspot is named by driver serial. You don't need to input password when connect to the WIFI hotspot. Access NET20 PLUS by IP address 192.168.10.1. The hotspot only play the role of control and can't access internet.

WIFI Client : When selecting WIFI client, in SSID box input a name of WIFI hotspot can be used for the search, and in the Password box input the password for connecting to WIFI hotspot, then submit. After connecting to the connection WIFI, the password can be seen in system terminal or panel interface (the displayed place will be different in different versions).

Mobile network : After starting the mobile network, enter the function mode supported by the SIM card; NET20 PLUS supports 4G netcom. Users can set the user name and password as needed.

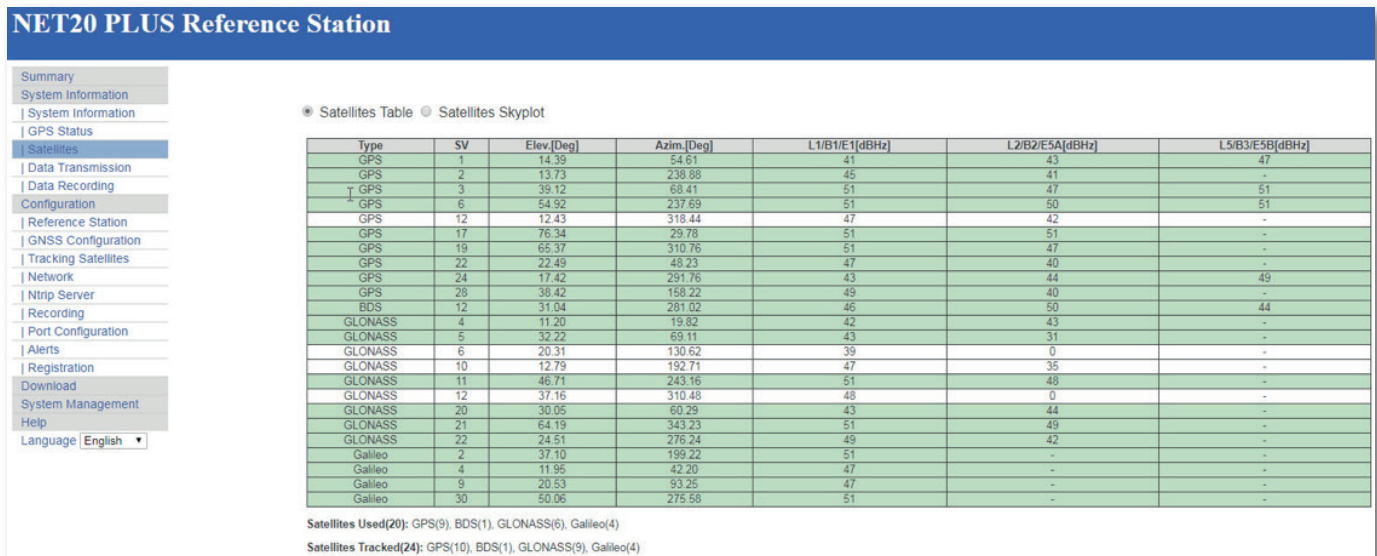


Figure 3-11

FTP download : You can set the parameters of the FTP download. If anonymous access is turned on, it does not require a user name and password to connect to the NET20 PLUS for FTP downloading. If

anonymous access is turned off, you need permission to enter the user name and password. After using the FTP tool to connect NET20 PLUS, the data appears as follows :

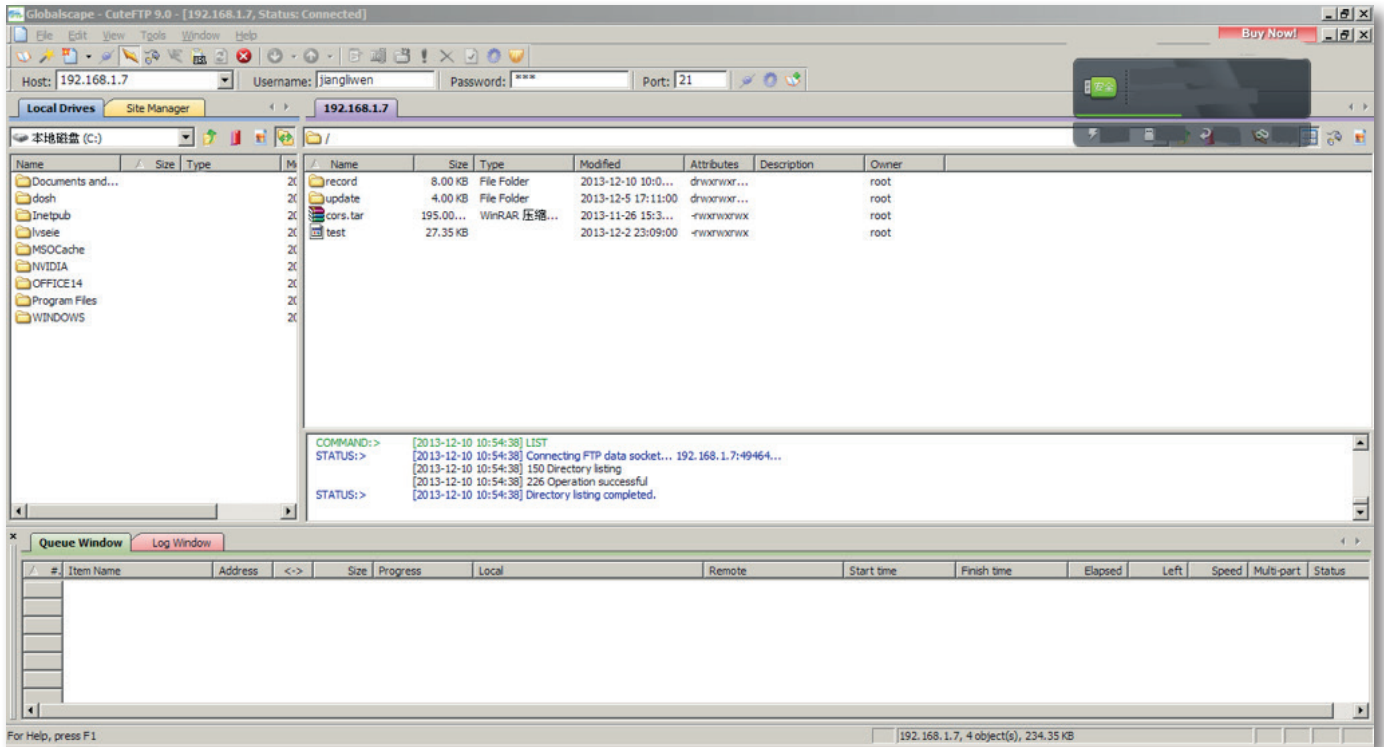


Figure 3-12

3.3.5 Ntrip Server

In this page, the user could set the transmission content and the server for the NET20 PLUS reference station.

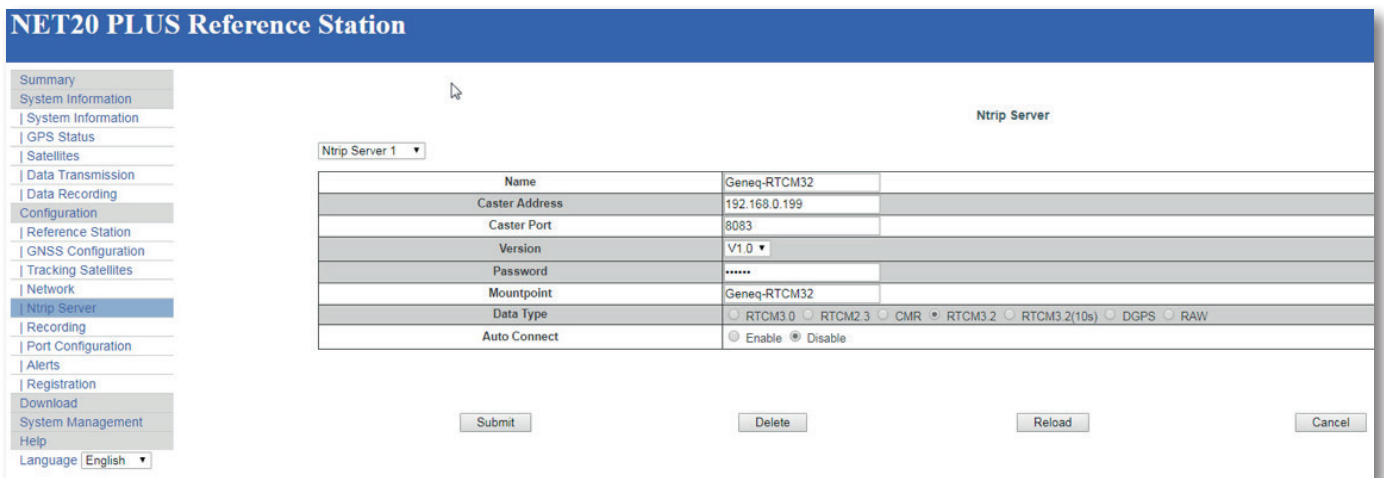


Figure 3-13

Note :

- a. The password in this page can be entered arbitrarily, but not empty.
- b. When the [Auto Connect] is chose, after the network is disconnected, the data transmission will be automatically connected, otherwise the transmission will need to be initiated artificially.
- c. Before setting parameters, please back to the page of reference station and make sure the base station coordinate is correct or not. If you need to start with known coordinates, please input the known coordinate.

After parameters setting, click "Submit" and the data transmission is turned on. In the status bar, you can see the data transfer status displayed as "transmitting". The differential transmission indicator in the front panel of the receiver starts to blink. The above process is the establishment of a base station transmission.

3.3.6 Recording

In this page, the user could set the data content of recording.

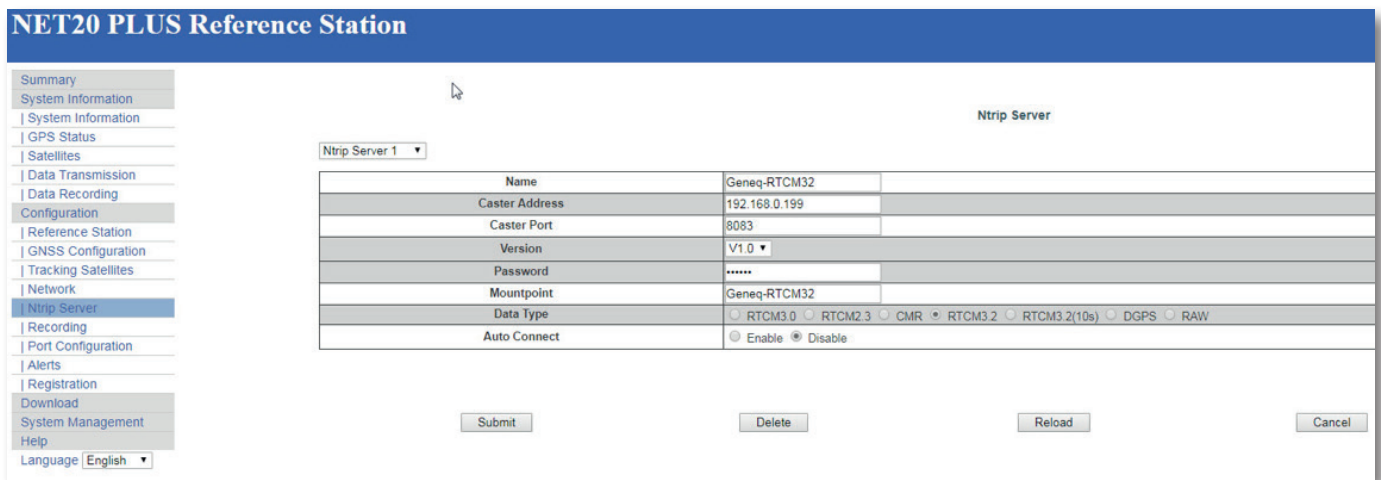


Figure 3-14

Static data record is stored as the data analysis, static solver and other post-processing.

File name : The static date could record in 4 ways.

Table 3-1 The rule of Static record file name

File name	Annotation
YYYYMMDDhhmmss.dat	Date and when, minute and second
YYYYMMDDhhmm.dat	Date and when, minute
DOYhhmm.dat	Day of year, hour and minute
YYYYDOY?.dat	Year, day of year, period of time
ssssdddf.yyt	Station name, day of year, period of time
Rinex302.dat	Named by rinex3.02 standard
Custom	Manually input the file name by the way of name + .dat

Duration time : After setting the record length, the file will be recorded depending on the setting time, and it will be stopped recording at the end of the record length. If you turn on the auto record, the NET every record length, or it need to be manually start recording.

FTP push : First you should set the FTP server parameters. When it records the data to the internal memory, NET20 PLUS will also send the data to FTP server automatically.

3.3.7 Port Configuration

Port setting includes Bluetooth port, COM1 port and Socket settings. They can support the function as follow :

CMD (INPUT/OUTPUT): Instruction NET20 PLUS

NMEA (OUTPUT): Output Specified NMEA sentences

RTK (INPUT): Differential Input

RTK (OUTPUT): Differential Output

RAW (OUTPUT): Raw data output

BINEX (OUTPUT): Output Specified BINEX sentences

By the way you can use com1 to connect the OEM.

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| **Port Configuration**
| Alerts
| Registration
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System Management
Help
Language English

I/O Configuration

Bluetooth	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
UHF	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
COM1	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
COM2	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Ntrip Client	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Ntrip Caster	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Socket 1	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Type	TCP
Mode	Server
Port	8084
Function	RTK(Output)
Data Type	RTCM3.2
Socket 2	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Socket 3	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Submit Reload

Figure 3-15

3.3.8 Alerts

When NET20 PLUS system or program exception occurs, NET20 PLUS will use e-mail or cell phone text message to notify manager in time for maintenance.

NET20 PLUS Reference Station

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Language English

Alerts

E-Mail Alerts	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
SMS Alerts	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Submit Reload

Figure 3-16

3.3.9 Registration

When NET20 PLUS receiver expires, you need to register it. And you just need to input the registration code and click Submit, then instrument register will be completed.

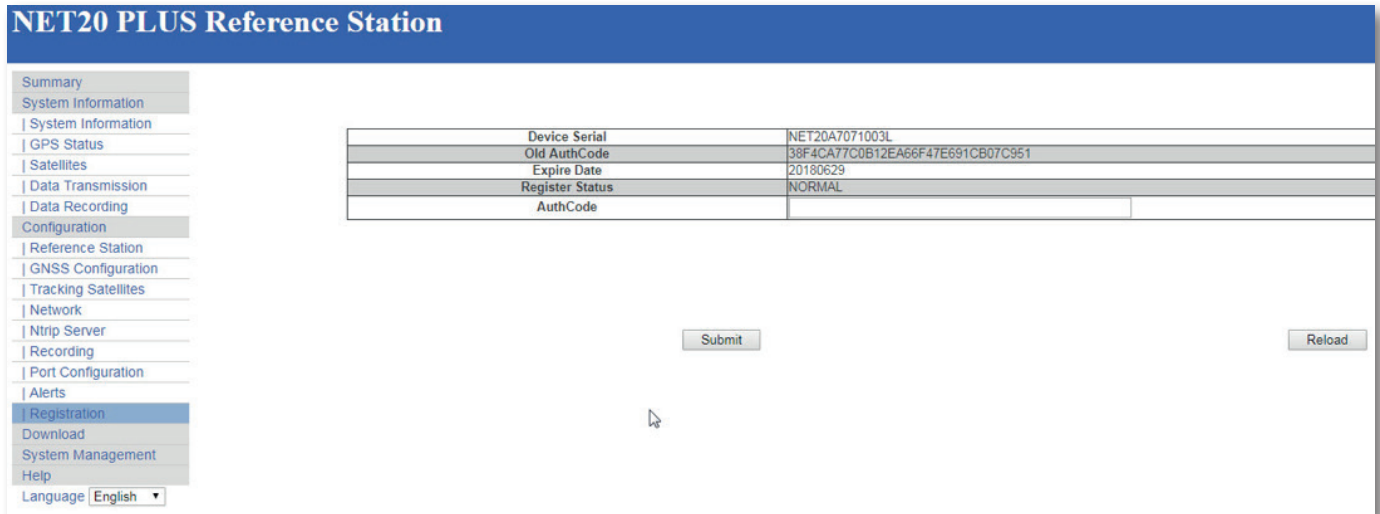


Figure 3-17

3.4 Download

Download data stored in the NET20 PLUS receiver by the way of the network connection. Alternatively, you can connect to NET20 PLUS receiver for copying data via USB cable.

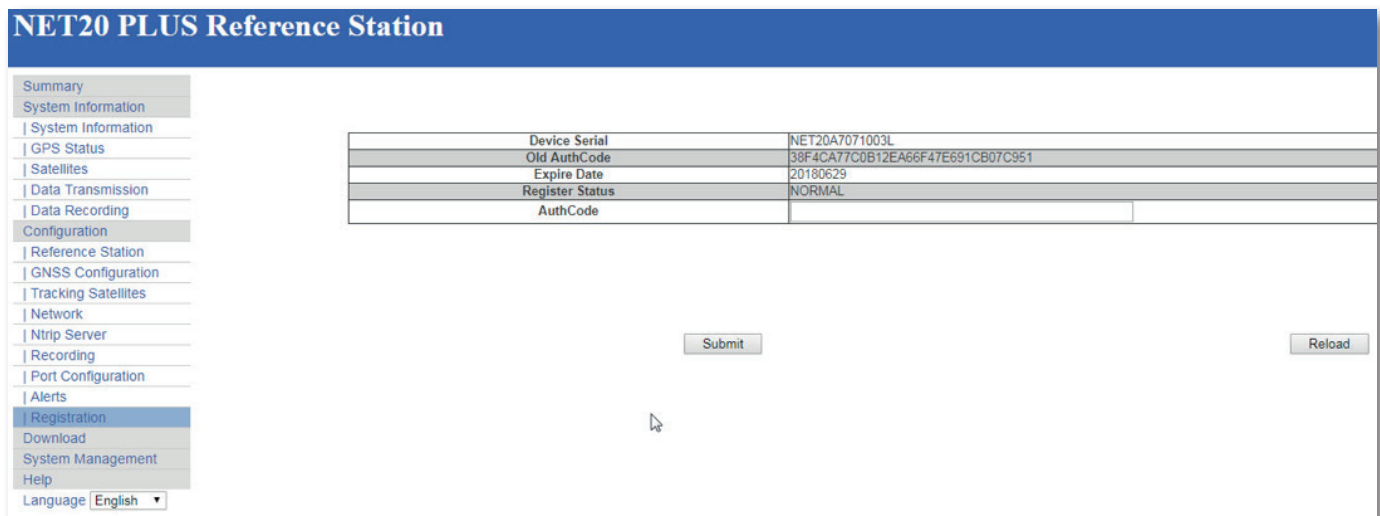


Figure 3-18

3.5 System Management

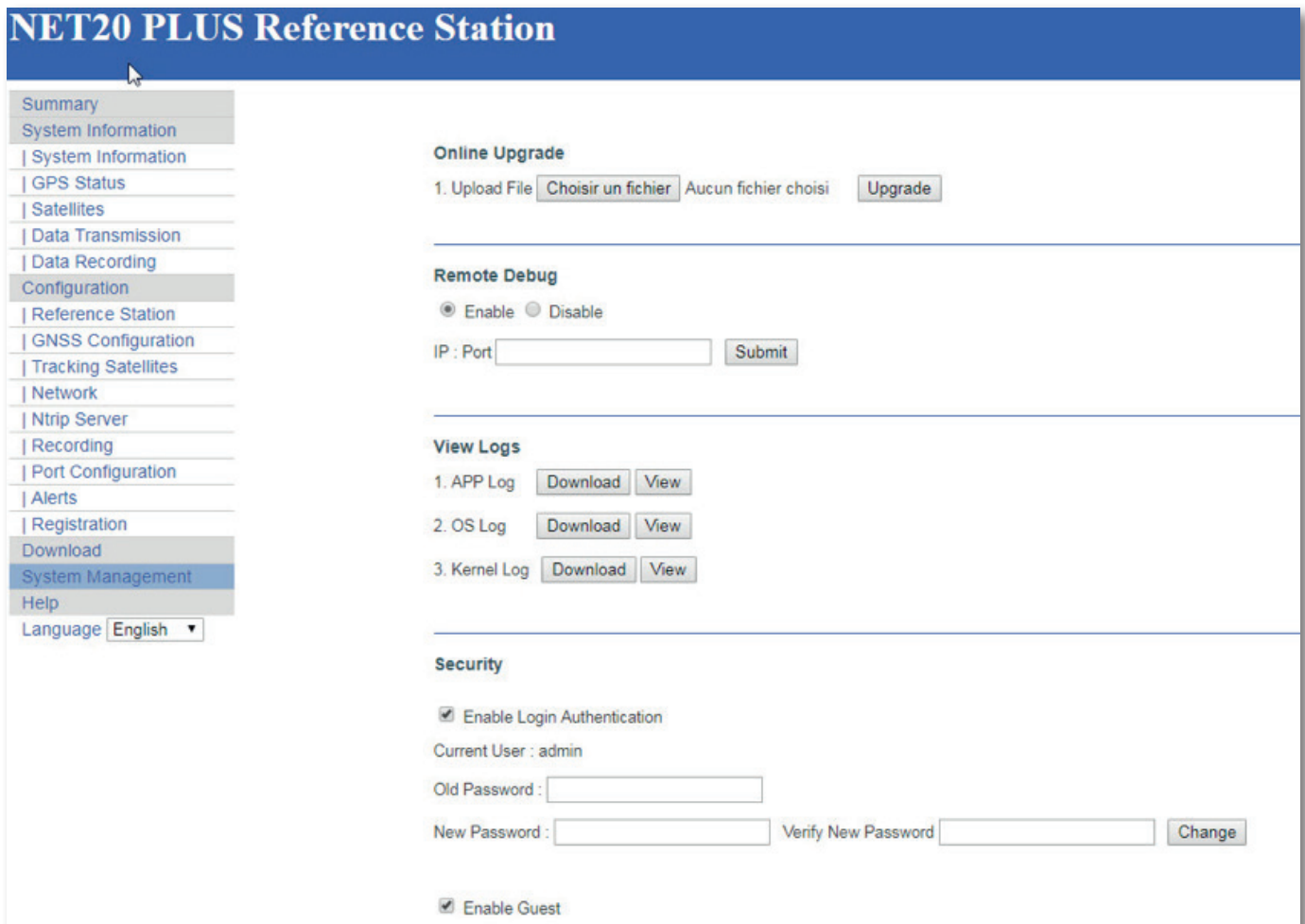
The users can upgrade online, view logs, secure login, and recycle storage.

Note :

1. Log view part are abnormal operation of storage systems and procedures of a record;
2. When setting the security login, the admin account is the manage account and the guest account can only view the information.

3.6 Help

Here provide operating guidelines for NET20 PLUS introductory guiding.



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| Recording
| Port Configuration
| Alerts
| Registration
Download
System Management
Help
Language English ▾

Online Upgrade
1. Upload File Aucun fichier choisi

Remote Debug
 Enable Disable
IP : Port

View Logs
1. APP Log
2. OS Log
3. Kernel Log

Security
 Enable Login Authentication
Current User : admin
Old Password :
New Password : Verify New Password
 Enable Guest

Figure 3-19

4 Operation

4.1 Power on

Press the red power button on the panel, and until the initialization is completed, you can see the main menu display on OLED screen as shown in figure 4-1.

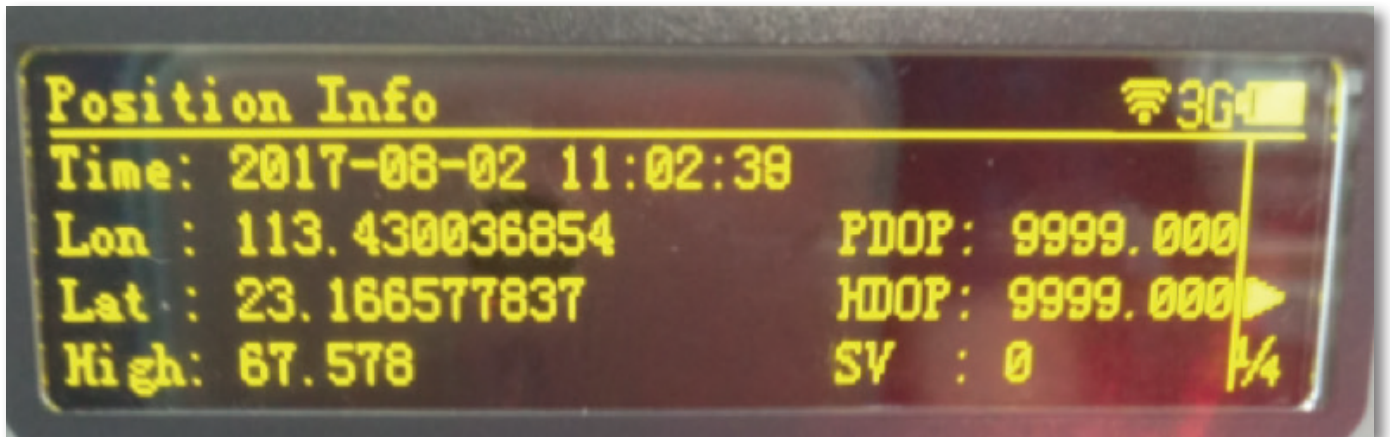


Figure 4-1

Press left or right soft key to view the current IP information of Ethernet, WIFI, and GPRS.

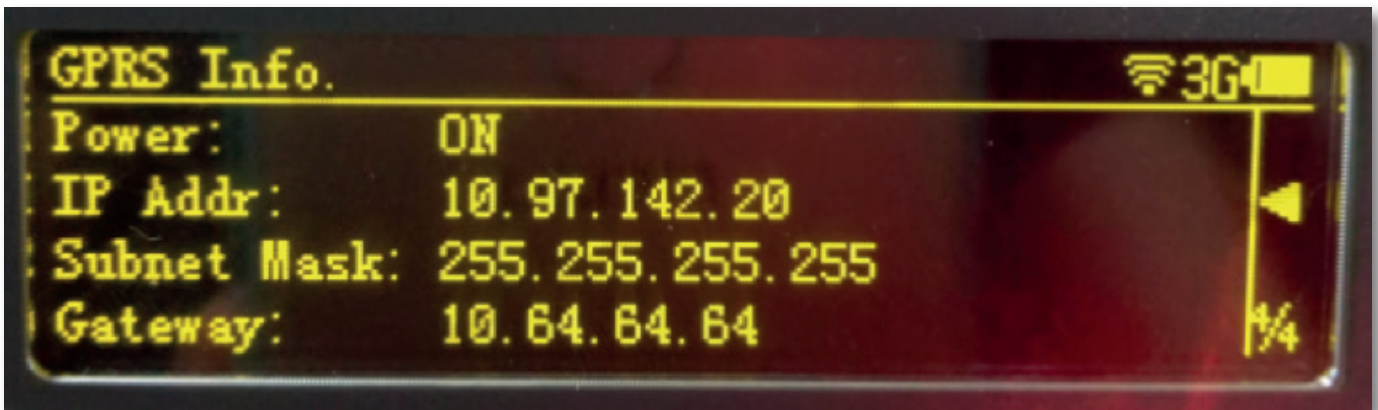


Figure 4-2



Figure 4-3

Figure 4-4



4.2 Quick setting

You can quick set the receiver by the panel key. It includes six parts: start record, transmit the data, network set, antenna set, other set, and device information.

Start Record : In the main interface, lightly press F2 key shown in figure 4-5.

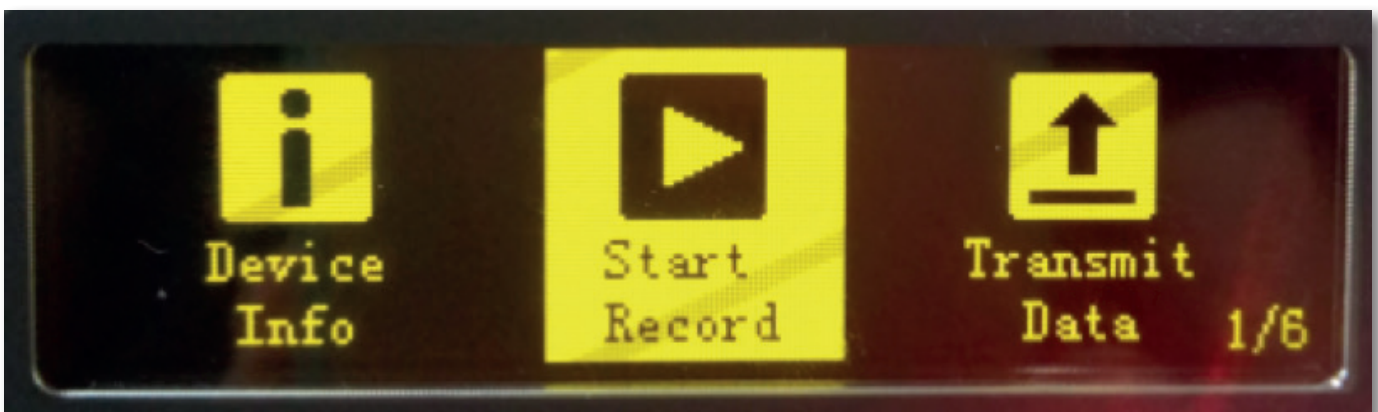


Figure 4-5

Lightly press power key to confirm, then enter into "Start Record", you can see the page shown in figure 4-6.

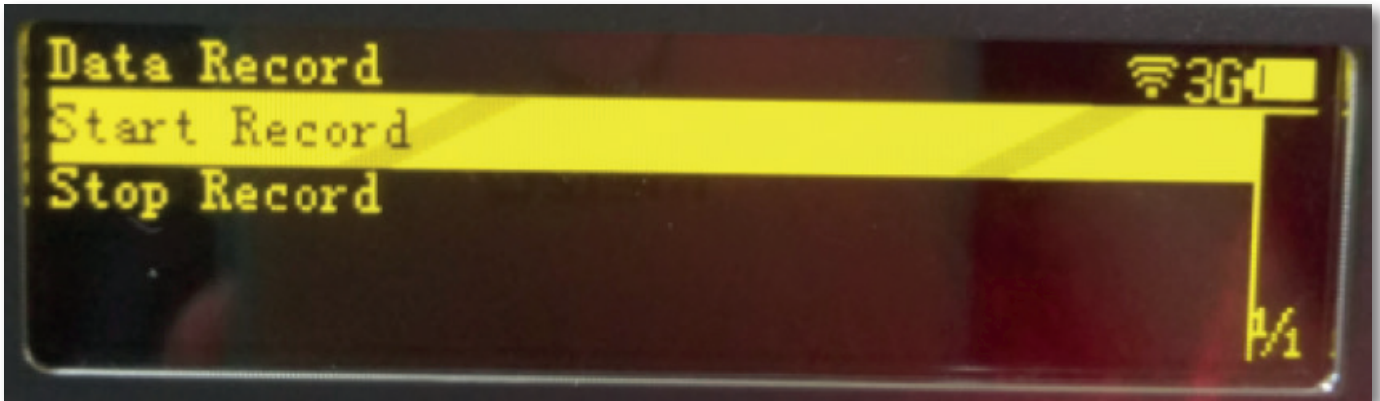
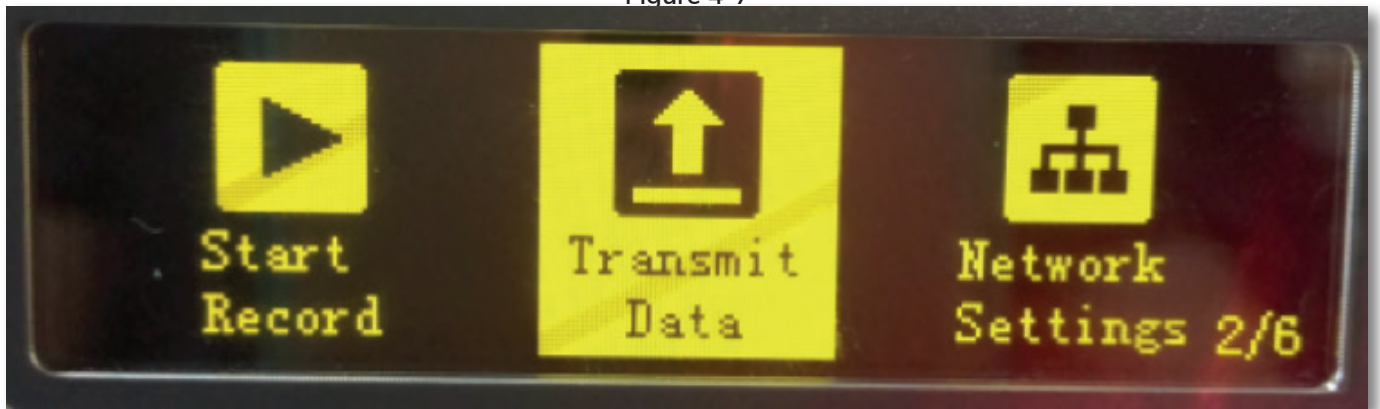


Figure 4-6

When the static is stopped, the cursor stops at the row of "Start Record"

Transmit Data : When you transmit data by the panel, first you need to set the transmission parameters in the WEB UI page, then you can operate the panel. There doesn't have the transmission parameters setup on the panel. We can quickly set differential type, start and stop transmit data.

Figure 4-7



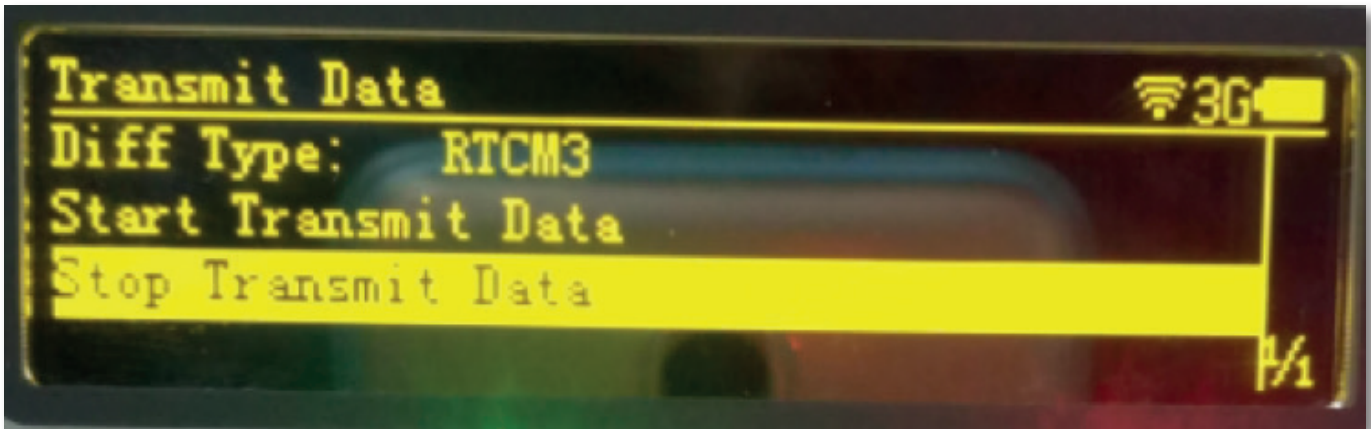


Figure 4-8

Network Settings: NET20 PLUS network settings can be set to automatically obtain the IP or choose a static IP mode.

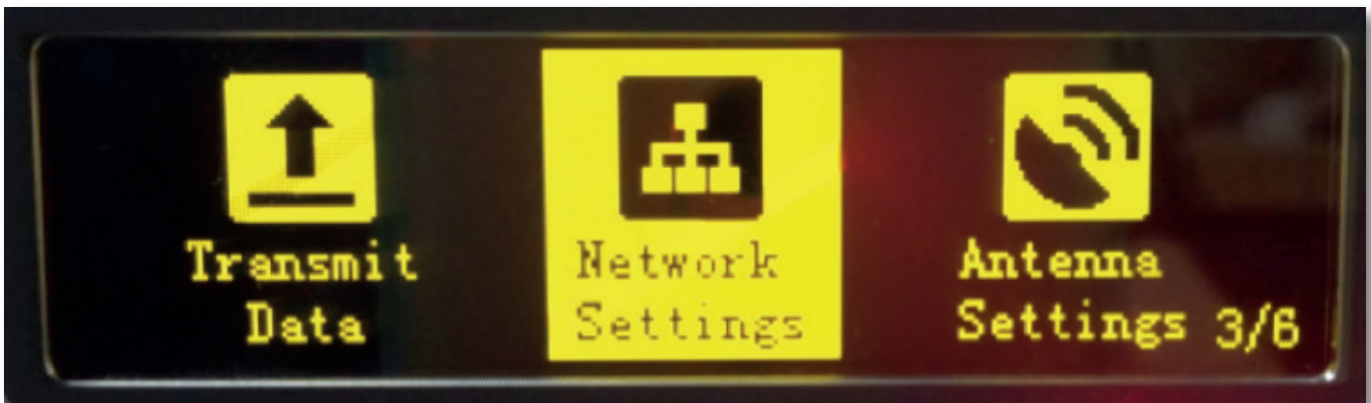


Figure 4-9



Figure 4-10



Figure 4-11



Figure 4-12

Antenna settings: Not support for the moment.

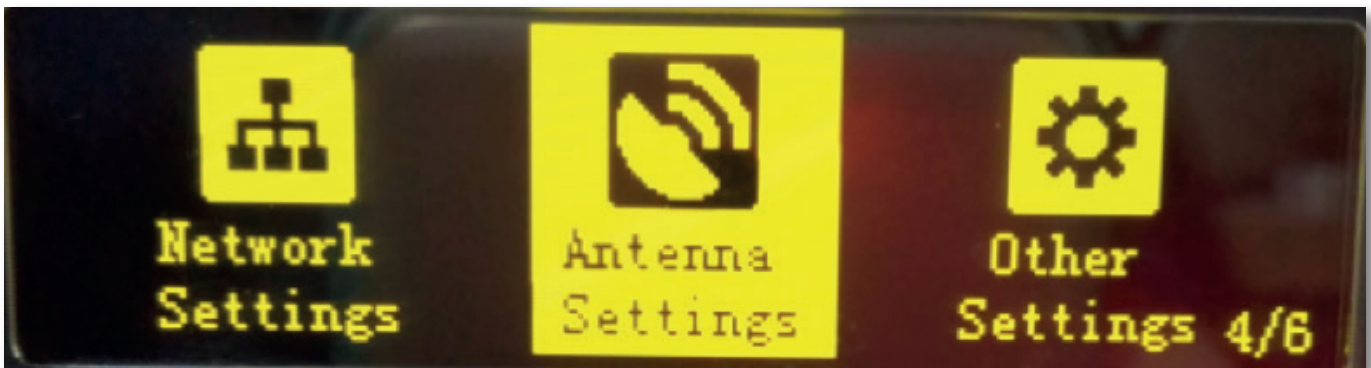


Figure 4-13

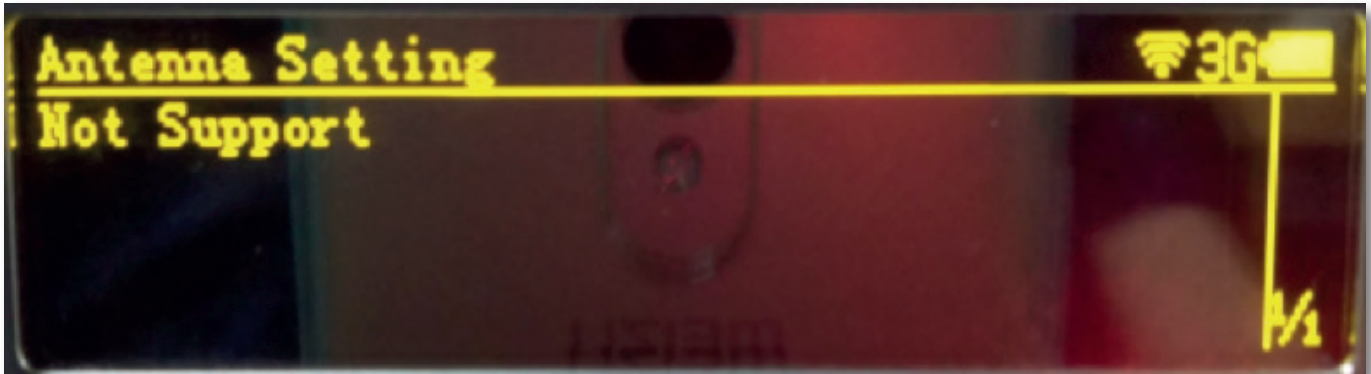


Figure 4-14

Other settings: Other settings could set the OLED language display, OLED brightness, OLED turned off interval.

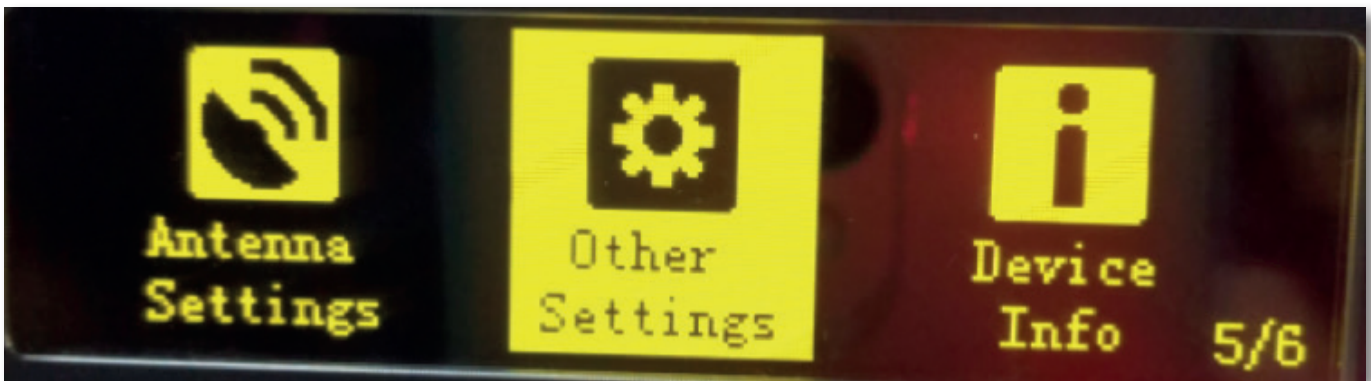


Figure 4-15

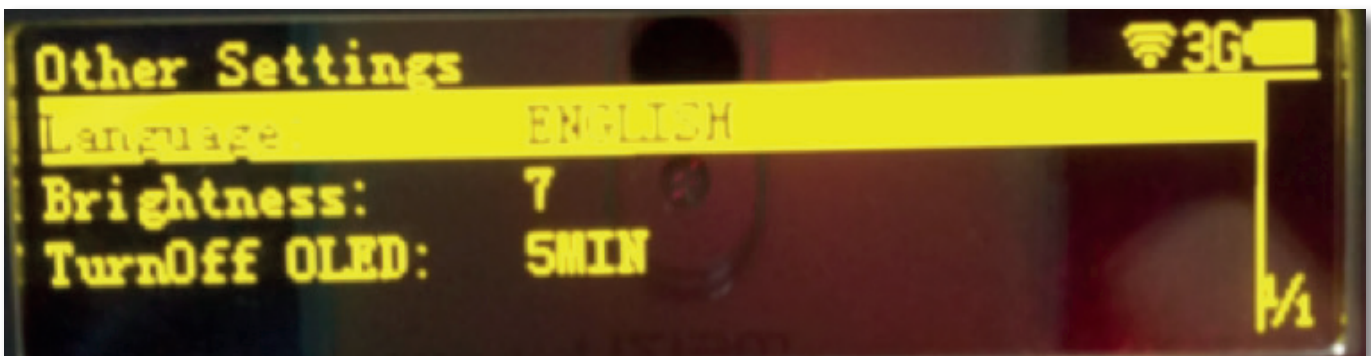


Figure 4-16

Device information: In this page, you can get the information of device model, device serial, hardware version and BOOT version.

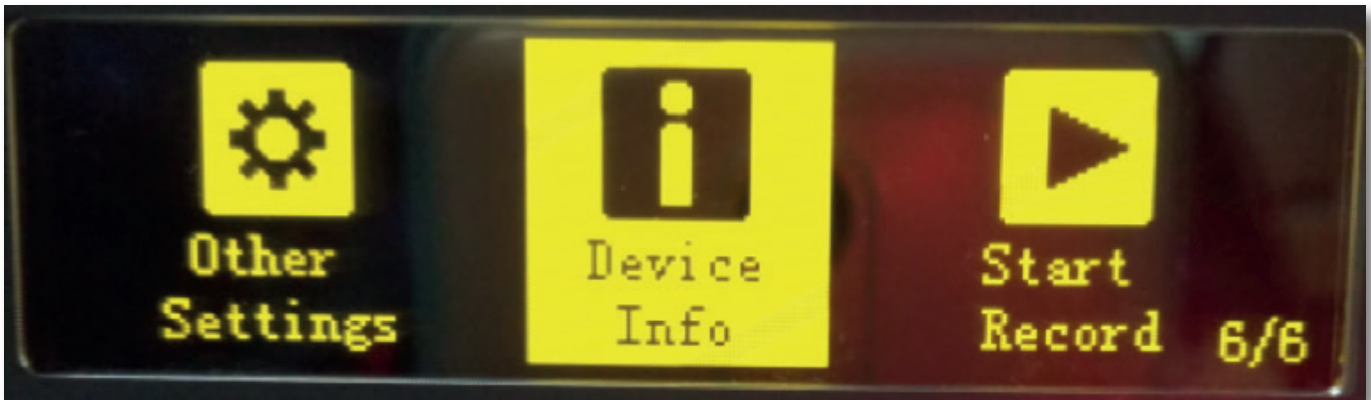


Figure 4-17

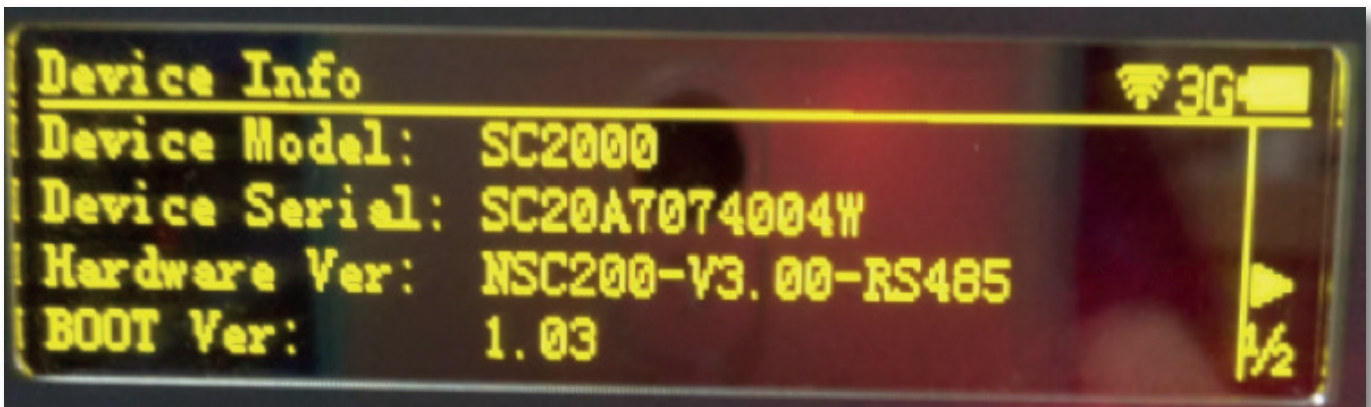


Figure 4-18

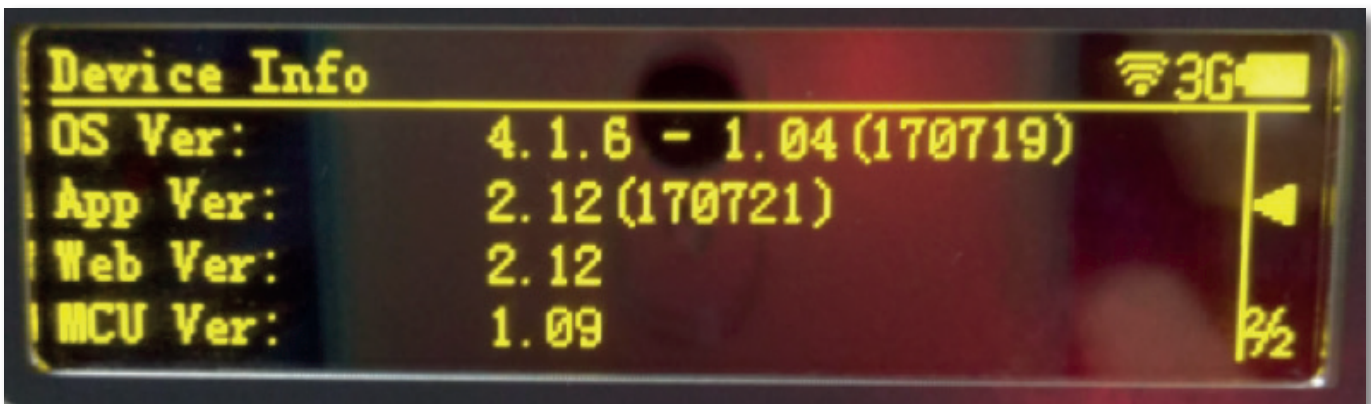
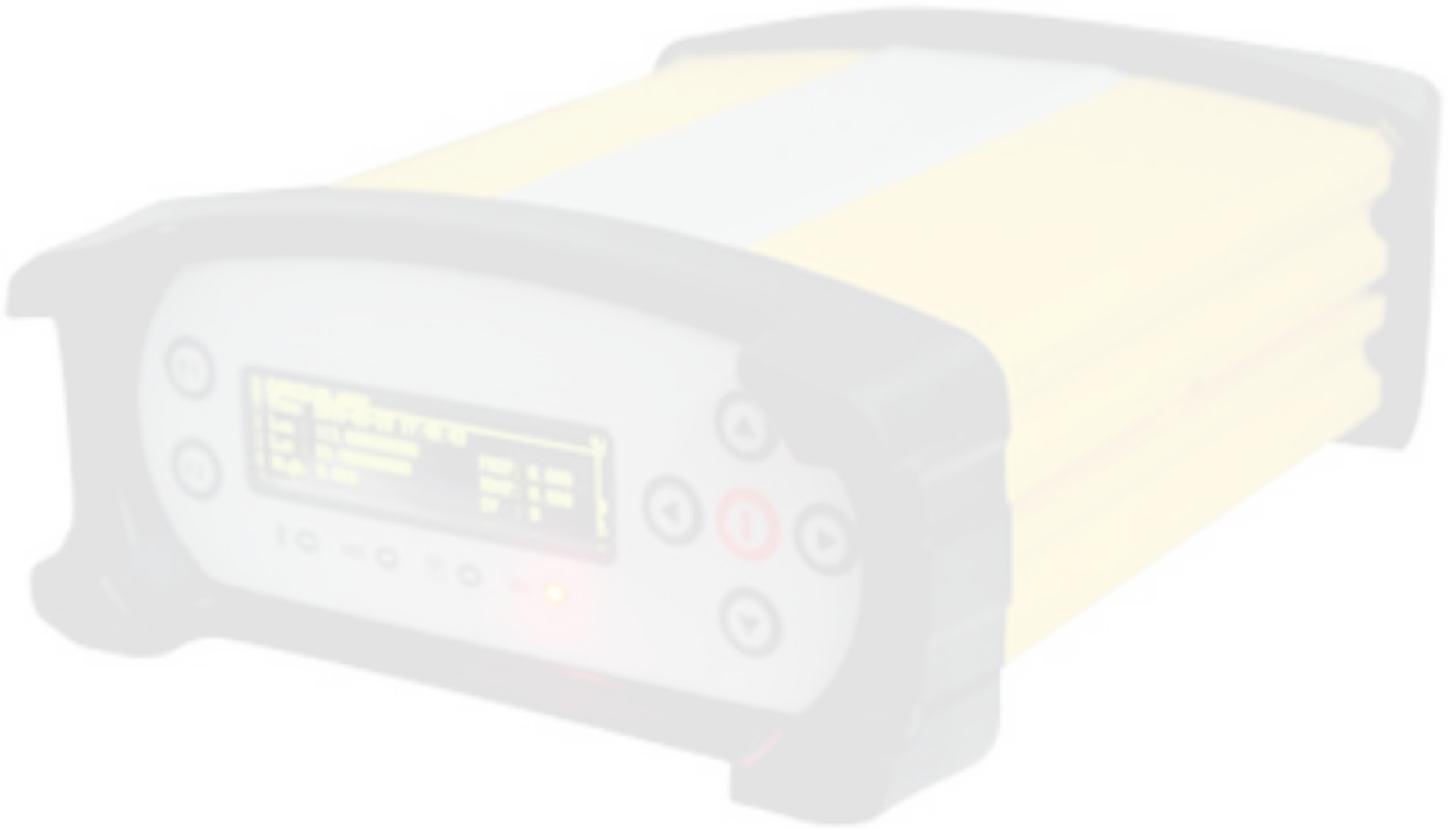


Figure 4-19

5 Accessories

Table 5-1 Accessories of NET20 PLUS

Categories	Model	Description	Quantity
Standard accessories			
Antenna	HX-CSX601A	GNSS survey antenna	1
Cable	Geo10-35-01	Cable for survey antenna (35 m)	
Adaptor	PSAA30R-150-2P	Power Adaptor with 4 plugs (US, UK, AU and EU), 15V/2A, 2PIN	1
Cable	TC.GK428.ABL	Lemo 7 to USB	1
Cable	LM.GK183.ABL	lemo 5 to DB-9 serial	1
Cable	CV-0088-3.0	DB9 female-DB9 female, to debug and transfer data	1
Cable	NETC3	Network cable 3M	1
Antenna	GA.110.101111	4G LTE antenna, male SMA connector	1
Optional accessories			
Antenna	HX-CG7601A	Chock ring GNSS antenna	x
Cable	Geo10-35-01	Cable for choke ring antenna (35m)	x
Cable	TC.GK427.ABL	lemo 5 to DB-9 serial(RS485)	x
Antenna	QC410A	UHF antenna for external radio, TNC connector, 410-430MHz	x
Antenna	QC430A	UHF antenna for external radio, TNC connector, 430-450 MHz	x
Antenna	QC450A	UHF antenna for external radio, TNC connector, 450-470 MHz	x



NET20 PRO