NET S9

User Manual

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Chapter1 NetS9 introduction

1.1 Brief

NetS9 is a high-end Beidou CORS receiver based on many years of technology accumulation of SOUTH Company. It is domestic independent satellite navigation system, with independent core technology. Receiver uses small volume efficient core processor of Cortex-A5 with strong performance and fast compute speed. As we know, international mainstream operating systems are Windows and Linux, and NetS9 chooses Linux as the built-in operating system which has powerful onboard software, it is a real embedded control system. Receiver of NetS9 is built with new aluminum alloy design, and it can adapt to the complex work environment with Level of IP67 industrial design and fully meet the CORS system unattended for a long time and stable operation of demand.

New design NetS9 reference station receiver provides diverse interfaces and powerful Web Server functions, etc.

NetS9 designs a fixed stent which is convenient to install and can be installed anywhere. According to the industrial standard to choose receiver internal electronic components, receiver can stable work in 40 ℃ to 75 ℃environment, all parameters are automatically saved in the internal FLASH, parameters will not change when power supply drop, the instrument can automatically connect to the server.

NetS9 can not only upload static data, observation data, satellite data and differential data, but

also it adopts stable and reliable eMMC storage method and it has the automatic cycle storage function. In addition, the users can use external mobile storage devices to backup the static data by USB interface; data can also be downloaded remotely.

NetS9 has flexible configurations, such as local network configuration, WIFI connection, Bluetooth connectivity, and buttons with LED screen configuration, serial port configuration and the network remote configuration. It supports remote restart, remote format the SD card, remote registration and firmware upgrade, which help users easily to maintain and reduce the costs.

The receiver has auto restart function which can work continually after blackout without any setting again; it has long-term and stable capacity of work, which can long-term continuously track satellite signals and record raw data.

NetS9 reference station receiver technology characteristics are as follows:

1. 440 channels, fully compatible with all major satellite positioning system;
2. Receiver uses smallest Cortex-A5 as core processor, strong and fast;
3. Built-in stable and reliable Linux operating system;
4. NetS9 is built with new aluminum alloy design, and it can adapt to the complex work environment with Level of IP67.
5. The front panel LED display design realizes that setting receiver without PC;
6. Providing WiFi function which allows to configure receiver via Wifi connection, greatly

improves the user experience and convenience;

7. Support STH, RINEX2. X and RINEX3. X;
8. 10000 mAH built-in battery, it can be used as either a main power or uninterrupted UPS power, provides more than 15 hours of battery life;
9. Double RJ45 Ethernet interface design, stronger applicability;
10. With 8 GB high-speed built-in memory, stable and reliable eMMC storage method, the receiver has the automatic cycle storage function. In addition, the user can use external mobile storage devices(The biggest store of 1TB) to store the static data by USB main interface;
11. Standard external 10MHZ frequency input interface, one PPS output interface, one event input interface and weather/tilt sensor interface.

1.2 Index of performance

GNSS character

◎440 channels

COMPASS: B1、B2、B3

GPS:L1 C/A, L2E, L2C, L5

GLONASS:L1 C/A and P , L2 C/A (only for GLONASS M）, L2 P

SBAS:L1 C/A, L5

GIOVE-A:L1 BOC, E5A, E5B, E5AltBOC

GIOVE-B: L1 CBOC, E5A, E5B, E5AltBOC

GALILEO: GIOVE-A, GIOVE-B, E1, E5A, E5B

◎Unfiltered, unsmoothed pseudo range measurements data for low noise, low multipath error, low time domain correlation and high dynamic response

◎Very low noise of GNSS carrier phase measurement, the precision of 1 HZ bandwidth < 1 mm

◎The SNR of the dB - Hz report

◎Proven Pacific crest low elevation Angle tracking technology

◎Support a variety of satellite navigation system

◎Supports real-time static and dynamic dual-frequency RTK, supports both single frequency BD - 2 calculating model

◎Unique RTK technology, guarantee the reliability of the positioning accuracy, greatly improve the quality of the data decoding

◎Intelligent dynamic sensitivity positioning technology, adapt to the environment changes, adapt to more and more bad positioning environment and longer distance

◎Fully compatible high compact message, easy to form a complete set of data transmission and software application development

◎Stable long-distance RTK calculating ability

Position accuracy

◎static:

Plane:±(2.5mm+1x10-6D), elevation：±(5.0mm+1x10-6D)

◎RTK:

Plane:±(10mm+1x10-6D), elevation：±(20mm+1x10-6D)

◎Initialization time: Less than 60 seconds

◎Initialize the reliability: Generally greater than 99.9%

◎Memory: 8GB, can record up to 12 months of the original observation data, (satellite data records for 5 seconds an epoch), Support large capacity 64G of industrial-grade data SD memory card

◎Position output: 1HZ, 2 HZ, 5HZ, 10HZ and 20 HZ and 50 HZ(depending on the installation options),output original measurement and location of up to 50 HZ

◎Store formats: STH, RINEX, BINEX

◎Naming files: Variety

◎Data retrieval and transfer: HTTP download, FTP download, USB copy

◎Navigation outputs: ASCII: NMEA - 0183 GSV, AVR, RMC, HDT, VGK, VHD, ROT, GGK, GGA, GSA, ZDA, VTG, GST, PJT, PJK, BPQ, GLL, GRS, GBS and the binary

◎Reference outputs: CMR, CMR+, RTCM 2.1, RTCM2.2, RTCM2.3, RTCM3.0, RTCM3. X

◎Support circular storage

◎Support external USB storage

Device interface

◎2 RJ45 network interface

◎2 RS232 interface, and support the aerometeograph, inclinometer and all kinds of sensors

◎1 main USB interface, external USB storage is used to record the original observation data

◎1 USB interface, the data of receiver internal storage can be downloaded directly by the interface

◎3 independent power input ports, ensure the power supply is reliable

◎1 external clock input interface

◎1external event input interface

◎1 GNSS antenna interface

◎1 WIFI antenna interface

Communication

◎Ethernet: RJ45 connector supports HTTP, HTTPS, TCP/IP, UDP, FTP, and NTRIP

◎Bluetooth: Supports 2.4 GHZ connection

◎WIFI: AP and the Client mode

User interface

◎A vacuum LCD screen, 8 buttons on the keyboard, the Web user interface

Battery and power supply

◎9 ~ 28 V DC input

◎Built-in lithium battery can work continuously more than 15 hours after charged

◎Power level: 3.8 W

Environment

◎Working temperature:-40℃ ~75℃

◎Storage temperature:-40 ℃~80 ℃

1.3 Appearance structure

1.3.1 Appearance

Receiver of NetS9 receiver appearance is as shown in figure 1-1.Receiver is rectangular in shape; the front panel provides buttons and LCD display function; Rear panel provides multiple interface functions: RS - 232 interface, RJ45 interface, antenna interface, power supply interface, USB interface, etc.

Fig. 1-1 NetS9

1.3.2 Front panel

NetS9 front panel is as shown in figure 1-2; it mainly provides buttons and LCD display function.

Fig. 1-2 NetS9 front panel

The front panel of each function module is as shown in table 1-1:

Tab. 1-1 NetS9 front panel functions

No	Function	Description
1,3	button	View and modify the receiver configuration
2	LED display	Check the working state of the receiver and function configuration

1.3.3 Rear panel

NetS9 rear panel provides a more diverse interface function, is as shown in figure 1-3:

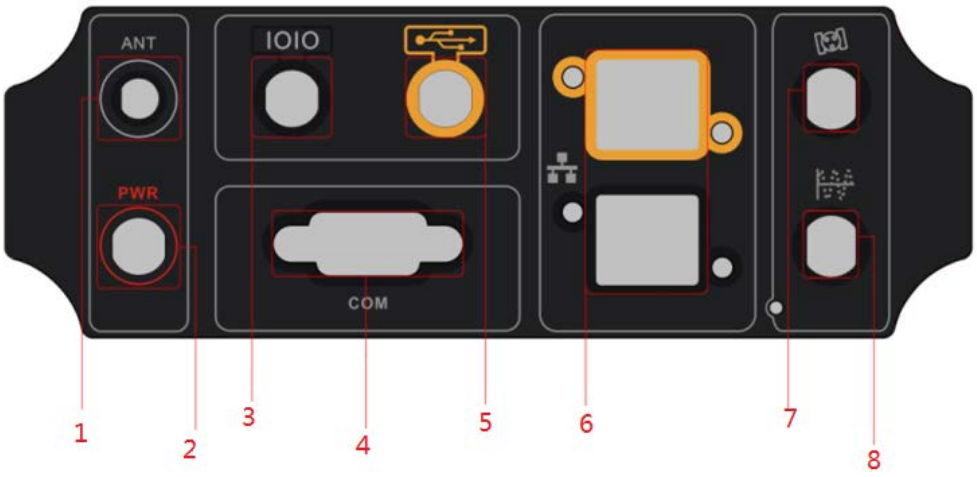


Fig. 1-3 NetS9 rear panel

NetS9 rear panel function of each interface is as shown in table 1-2:

Tab. 1-2 NetS9 rear panel functions

No	Function	Description
1	WIFI antenna interface	Connect WIFI antenna
2	power interface	External power and receiver built-in battery
3	Input/output interface	PPS output interface, external events input interface, a serial port and power interface
4	RS-232 interface	Static data output, the output difference data output, the navigation data, external interface
5	USB interface	USB function, power supply interface
6	RJ45 interface	10 m / 100 m Ethernet interfaces, static and difference data to the server
7	GNSS antenna interface	Connect GNSS antenna
8	External frequency standard	The external clock input

Chapter2 NetS9 power and battery

NetS9 provides a stable external power while providing a built-in battery as UPS functions. When plug into charger, the internal battery has automatic charging function; in the case of external power failure, it can safely switch to the internal battery automatically and ensure NetS9 stable operation for about 15 hours; similarly, when the external power supply is restored, built-in battery-powered mode can automatically safely switch to external power supply, then internal battery enter into the power storage state.

2.1 Ext power

The right to use an external power supply of NetS9 precedence over the built-in battery. Only when the receiver is not connected to an external power supply or external power failure, the internal battery will work.

For a receiver to work properly, the external power supply must provide 9V DC to 28V DC, and the power must be greater than 5W. When external power is disconnected and the built-in battery is exhausted, NetS9 will automatically shut down; when the power is restored, the receiver automatically starts and its configuration parameters will be restored to pre-shutdown state, and begin normal operation.

Warning: Do not place the external power adapter, its subsidiary plug, and cables to outdoors or in damp places. Do not use an external power to supply power when receiver works in a humid environment.

Warning: External power supply input voltage cannot exceed 28V DC, otherwise the receiver will have a fatal injuries.

2.2 Battery safety

NetS9 uses built-in rechargeable Li-ion battery. When using the battery, please note:

Warnings：

a) If the battery discolors and leaks or has other undesirable phenomena, please do not use;

b) Do not short circuit the battery, disassemble damaged, approaching heat or throw in a fire, avoid direct sunlight;

c) Do not put the battery in water.

2.3 Battery charge & usage

The internal battery will automatically recharge when external power is used. Battery before first use, please fully charged. If the battery is placed for three months without using, first fully charged, then use it. It will take about 24 hours for full charge.

Warnings：

a) Do not charge the damage or leaking battery;

b) Do not disassemble the battery and charge alone.

2.4 Conserve battery

The battery should be fully charged before conservation;

If long-term conservation, please ensure to charge once every three months.

Chapter3 NetS9 configuration

SOUTH NetS9 provides a variety of ways to configure the parameters, Including buttons, LCD, WIFI, Web Server, serial ports and Bluetooth. The button configuration and Web Server are the most commonly used configuration methods. According to the actual situation of the user to select the most efficient way to complete NetS9 parameter configuration.

3.1 Keys and LCD configuration

3.1.1 Key function

NetS9 front panel is as shown in figure 1-2, a total of eight buttons. Users can use these buttons to switch on/off receiver, restart the receiver, view and modify the configuration information, and so on.

Table 3-1 button introduction of NetS9

key	name	Function description
	Power	Power key
	Esc	Return to the main interface, cancel modification
	Reset	click this key 5sto restart the system
	Enter	Enter the page of parameter modification and confirm changes

	Up	Turn over the page and reduce parameter values
	Down	Turn over the page and increase parameter values
	Left	The cursor moves left
	Right	The cursor moves Right

3.1.2 LCD interface

After the completion of the system startup, LCD main interface will be displayed as shown in figure 3-1. In the main interface mode, click this key . Users can access to the parameters of the interface for base station to launch coordinate system and modifications of different schemes. The parameters of base station are as shown in figure 3-2.Under the arbitrary parameter interface; press the return key , returns to the main interface.

Fig. 3-1 LCD main interface

And the **SV** means visible satellite number; **BAT** means the built-in battery allowance; **MB** means receiver memory capacity and the **REC** light keep flashing shows that NetS9 is receiving and recording static data.

Fig. 3-2 parameters configuration interface

Then **Start Base** means start the base station mode, **Diff Type** means differential data type.

There are three kinds of base station start mode:

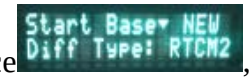
HERE：Using automatic repeat coordinates to start the base station

OFF：Manually start the base station

NEW：Using automatic single point coordinate to start the base station

Under the arbitrary parameter interface mode, if you need to modify the parameters, you can press the button Enter and modify the instrument parameters. At this time the cursor keeps flashing, and then you can press the buttons ▲▼ to change the location of the cursor, the button ◀▶ to modify the size of the parameter values. When these parameters all are changed, if you press the button Enter, it will save the data, the cursor disappears, the new configuration information goes into effect and the instrument return to the interface of Parameter Settings. If press the button Esc, it will not save the data, the cursor disappears, configuration information will restore and save previous information and the instrument return to the interface of Parameter Settings. At the same time, you can continue to press the button ▲▼ to view the other parameters. If you want to configure of base station start mode and sent differential data information directly, the screen lights up when you press any key,

then you can press the button , it appears the interface

. And you can press the key two times uninterruptedly to switch the interface 

, When the right triangle arrow moves toward to downside of **Start Base**, you can press the button to switch different working modes; what is more, you can press the key to switch the interface

,at the same time you can switch to send difference scheme of configuration directly by pressing the button .

If without operating for a long time, the instrument will automatically closed LCD screen and you can press any key to wake it up.

3.2 The Web Server configuration

When you enter the IP address of the NetS9 in IE browser, then you can access the Web Server system and complete NetS9 parameter configuration.

3.2.1 Login Web Server through LAN

1. Use physical method to connect to the Internet

Users can use a network cable to connect the NetS9 to local PC. NetS9 also can be connected to the local router or switch; we need make sure NetS9 with PC are in the same local area network (LAN).

2. Login the Web Server and set NetS9 parameters

Here NetS9 IP and local PC IP must be set to the same network segment. And you can enter NetS9 IP address in the IE browser, we suppose that NetS9 IP is 192.168.4.24 and input it, then we can enter the NetS9 Web Server system login page is as shown in figure 3-3.

Users can choose Chinese or English in the top right-hand corner of the login page through the shortcut key; At the same time, the NetS9 provides the "help" shortcut keys, if the user cannot login system or the system page is abnormal, they are available by clicking on the login page in the top right corner of the "help" to get the solution.

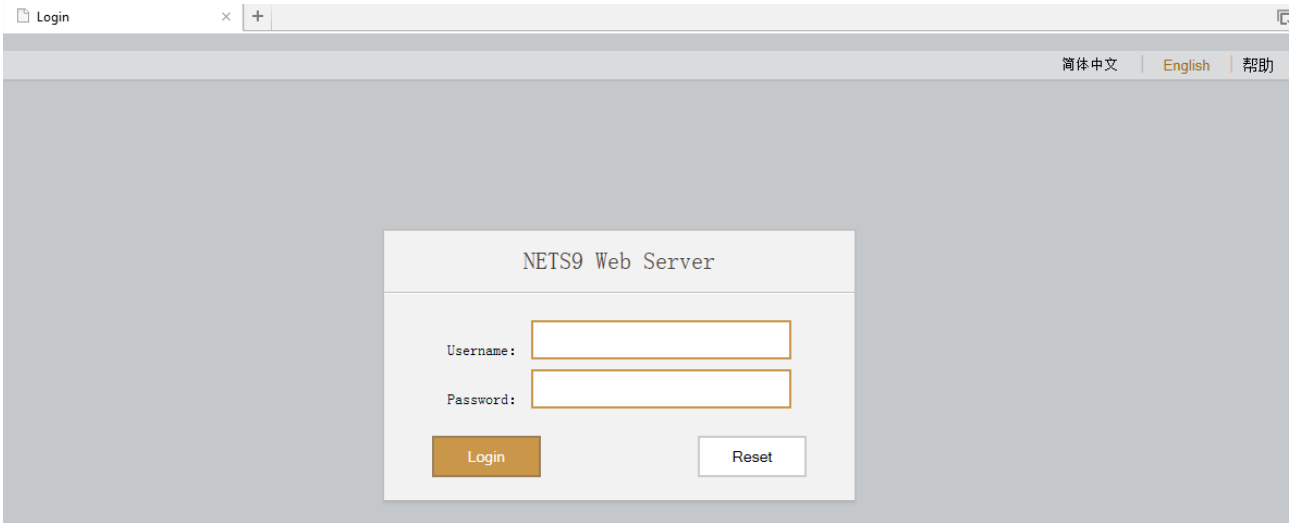


Fig. 3-3 NetS9 system login page

In the login page, user input the correct name and password, click "login" to enter NetS9 Web Server system home page as shown in figure 3-4. System default user name and password are as follows: admin, admin. After login system, you can change the password on the "change password" page.

Note: NetS9 Web Server system only supports Internet explorer browser, the other browsers are not supported!

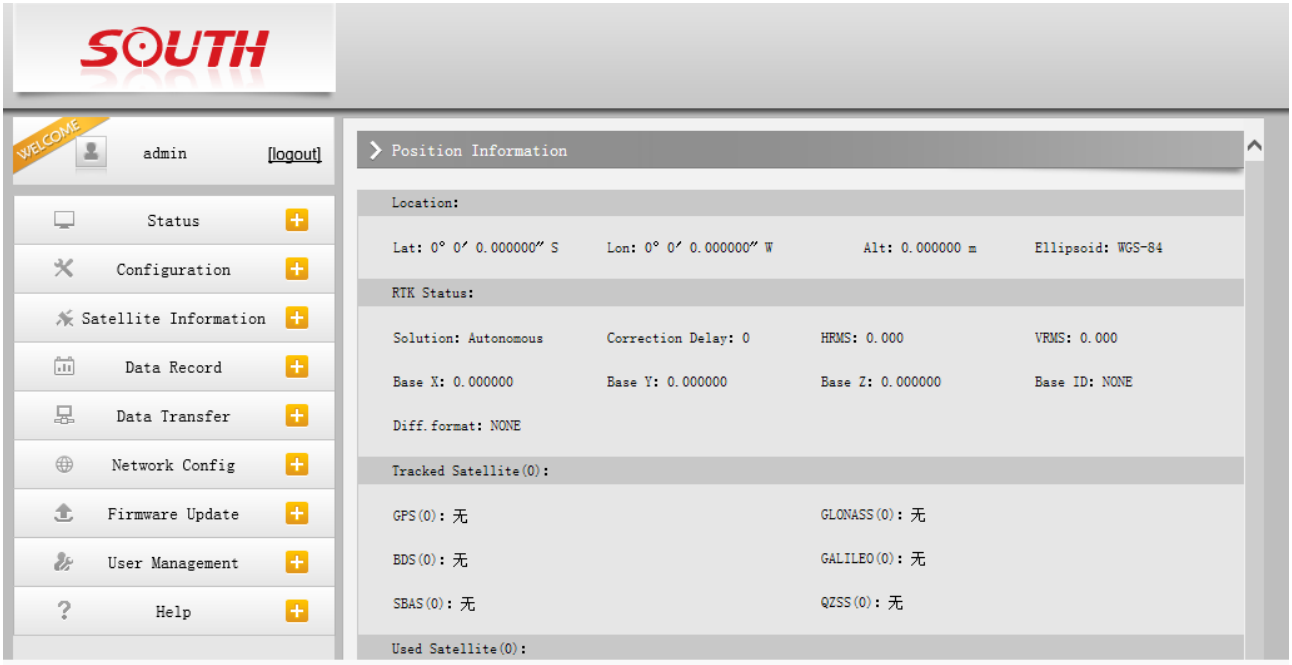


Fig. 3-4 home page of NetS9

As shown in figure 3-4, Web Server includes nine functional bars: status, configuration, satellite information, data record, data transfer, network config, firmware update, user management and help. Check the function as shown in table 3-2.

number	menu	Function introduction
1	Status	Provides information, working status and positioning information of receiver system
2	configuration	Register, base station settings, the antenna settings, satellite tracking settings, instrument control and the default language
3	Satellite information	The current satellite tracking information and satellite Settings

4	Data record	Set the static data collection interval and format
5	Data transfer	For raw data and differential data transmission
6	Network config	Receiver network parameters and WiFi Settings
7	Firmware update	Receiver firmware upgrade
8	User management	Increase and manage the Web Server user
9	Help	Get the solution

Tab.3-2 the main functions of each menu of Web Server

1) The status menu

The menu of ‘status’ is as shown in figure 3-5, includes the following pages: system information, work status and position information.

Fig. 3-5 "receiver status" menu interface

"System Information" provides the NetS9 routine information, receiver model, MAC address and firmware version information etc.; "Work mode" shows NetS9 physical state, such as temperature, voltage, built-in battery and the rest of the storage space; "Information" provides the base station's current location information, satellite status and PDOP value.

2) The configuration menu

The configuration menu is as shown in figure 3-8. Users can set the various parameters of the NetS9 through the “receiver configuration" , then save settings and parameters will take effect immediately. The menu interface of Receiver configuration mainly includes: general Settings, the base station settings, antenna settings, satellite tracking settings, receiver control and the default language.

A "General Settings" interface is as shown in figure 3-6. Users can complete NetS9 main

work mode settings and register receiver here.

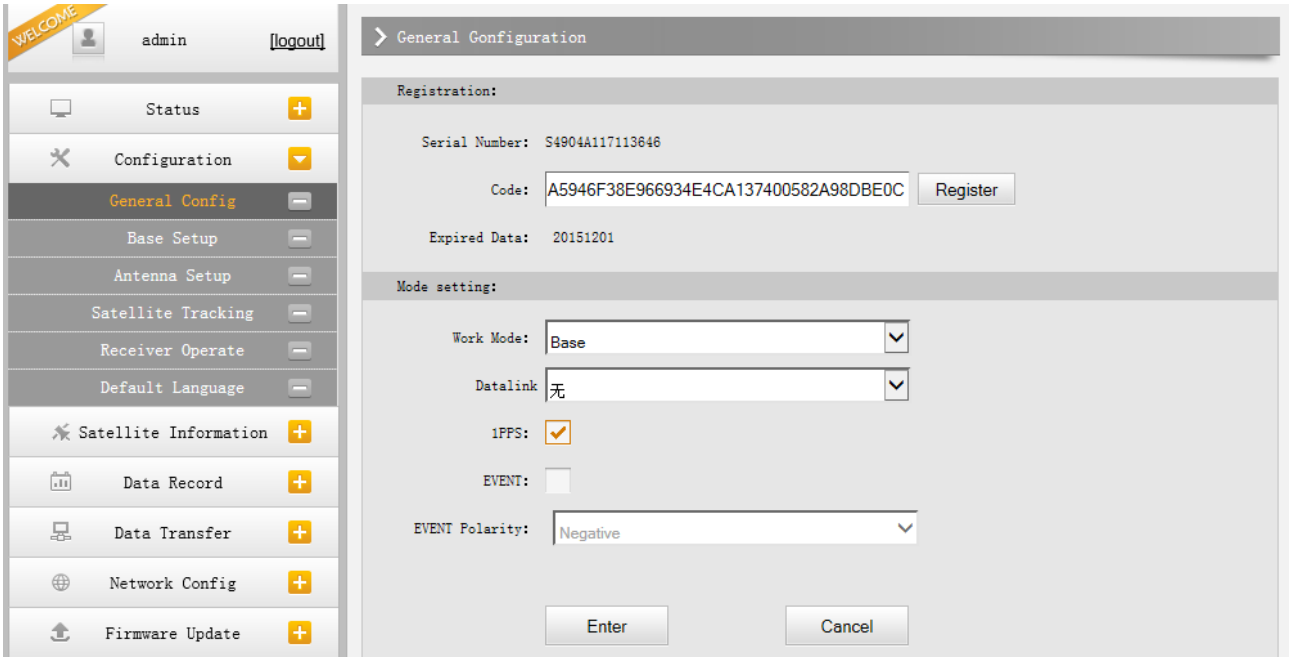


Fig. 3-6 general config interface

a)"Base setup" interface is as shown in figure 3-7. Users can complete basic settings, such as base station coordinates and differential format etc.; Users not only can input the precise coordinates but also can click on the “current position” to get coordinates automatically;

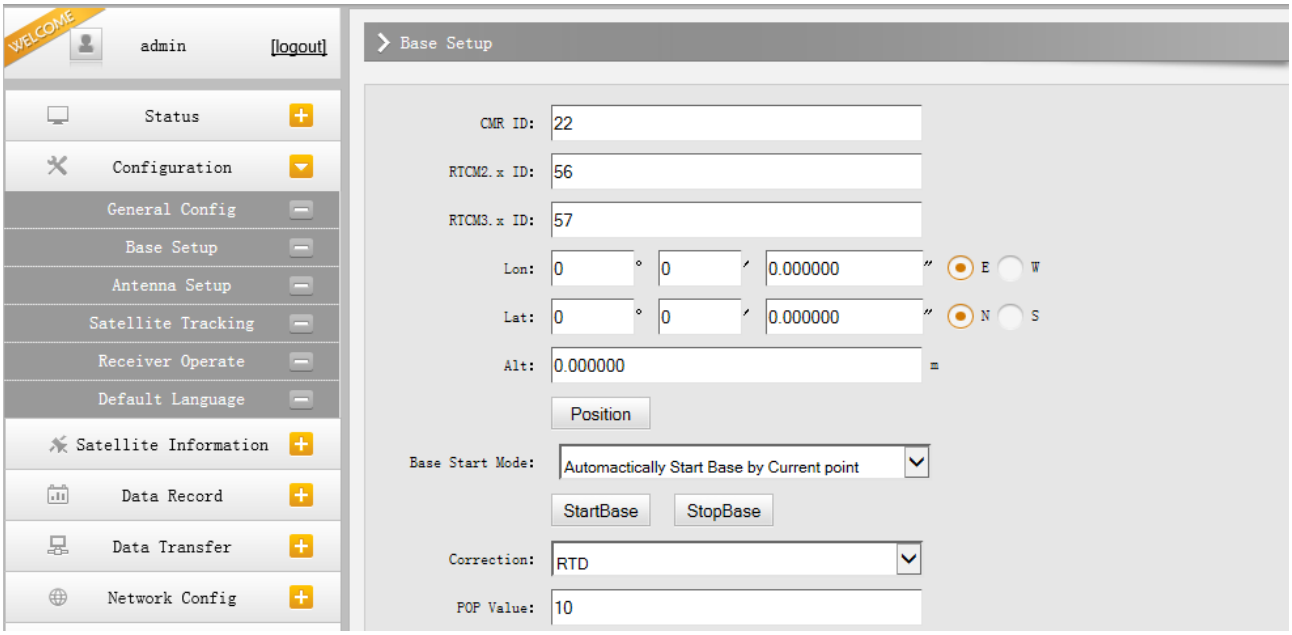


Fig. 3-7 the interface of base stations setup

b)"Antenna Setup" interfaces is as shown in figure 3-8 .Users can choose different measuring methods for antenna height;

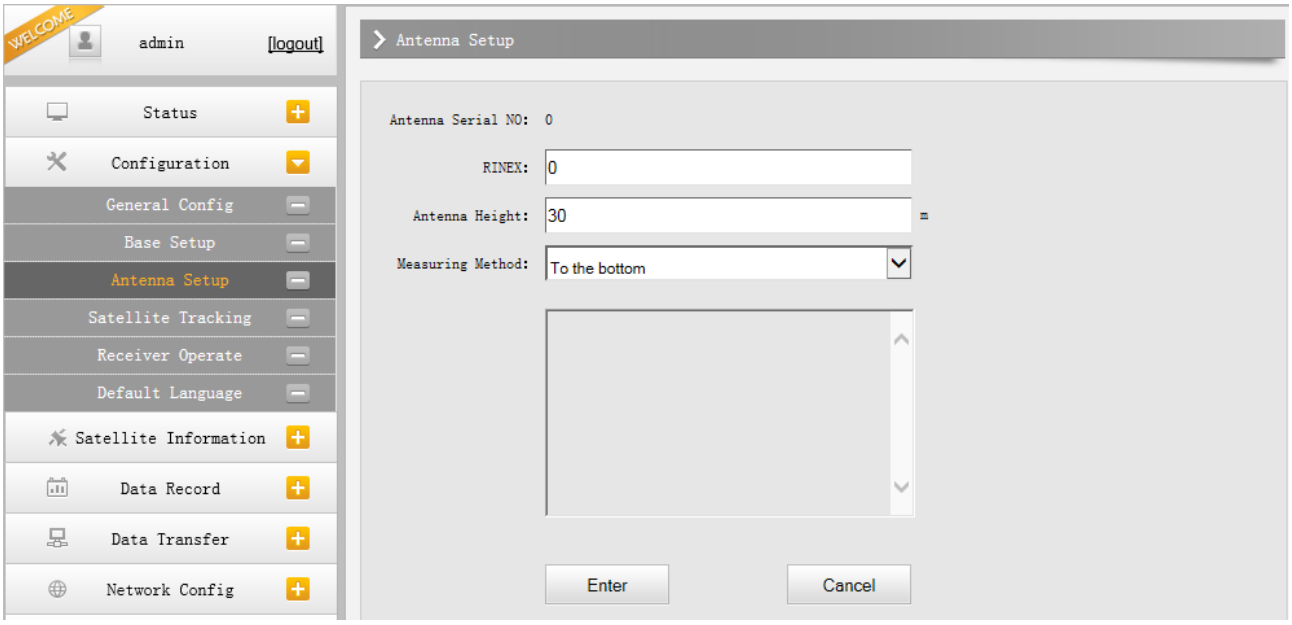
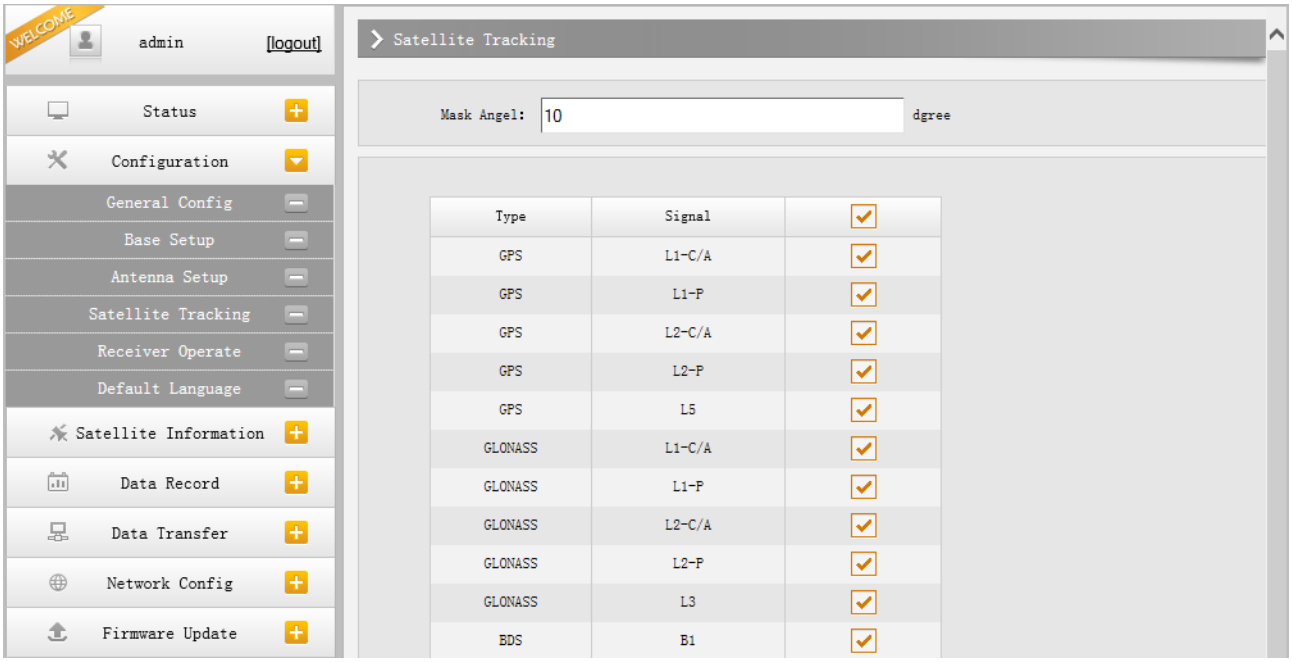


Fig. 3-8 the interface of antenna setup

c) The "satellite tracking" interface is as shown in figure 3-9. Users can set different satellite systems, satellite signal and Mask Angle;



d) “Receiver operate” interface is as shown in figure 3-10.

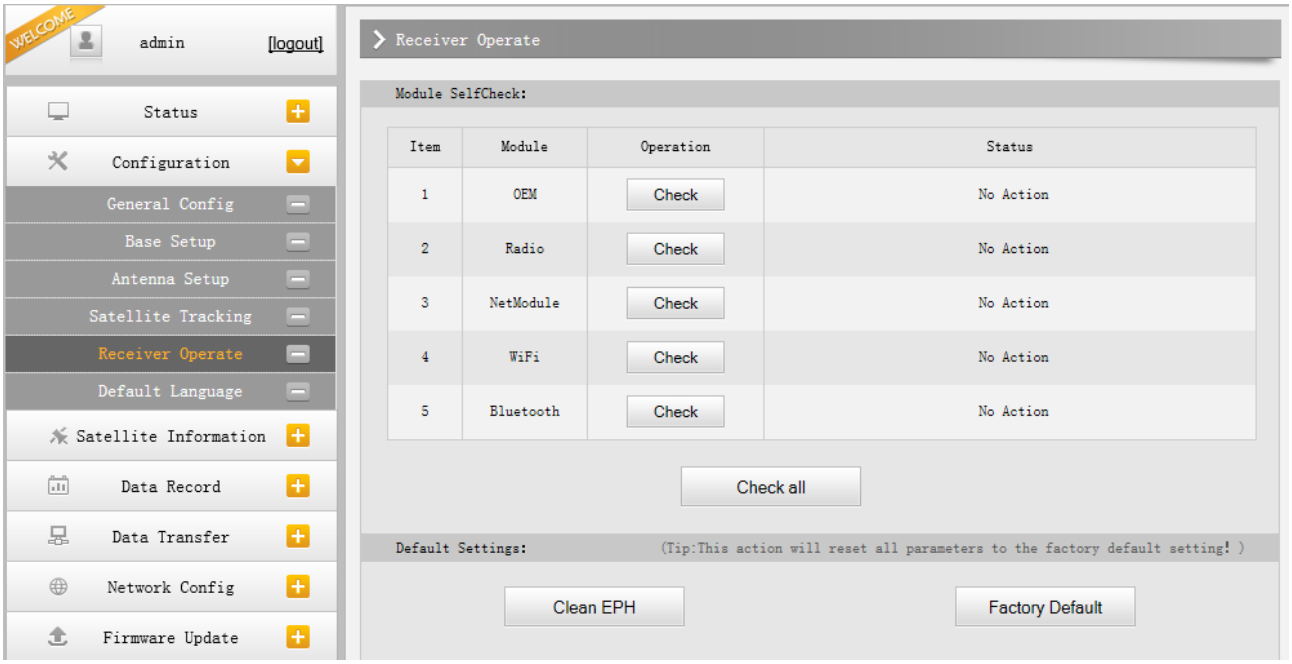


Fig.3-10 “receiver operate” interface

e) "Default language" interface, here users can choose Chinese or English as display language.

B "Satellite information" interface is as shown in figure 3-11. You can view satellite tracking

information in different ways, table, figure or skyplot. At the same time, you can also click the enable/disable to select whether the single satellite signal is available or not.

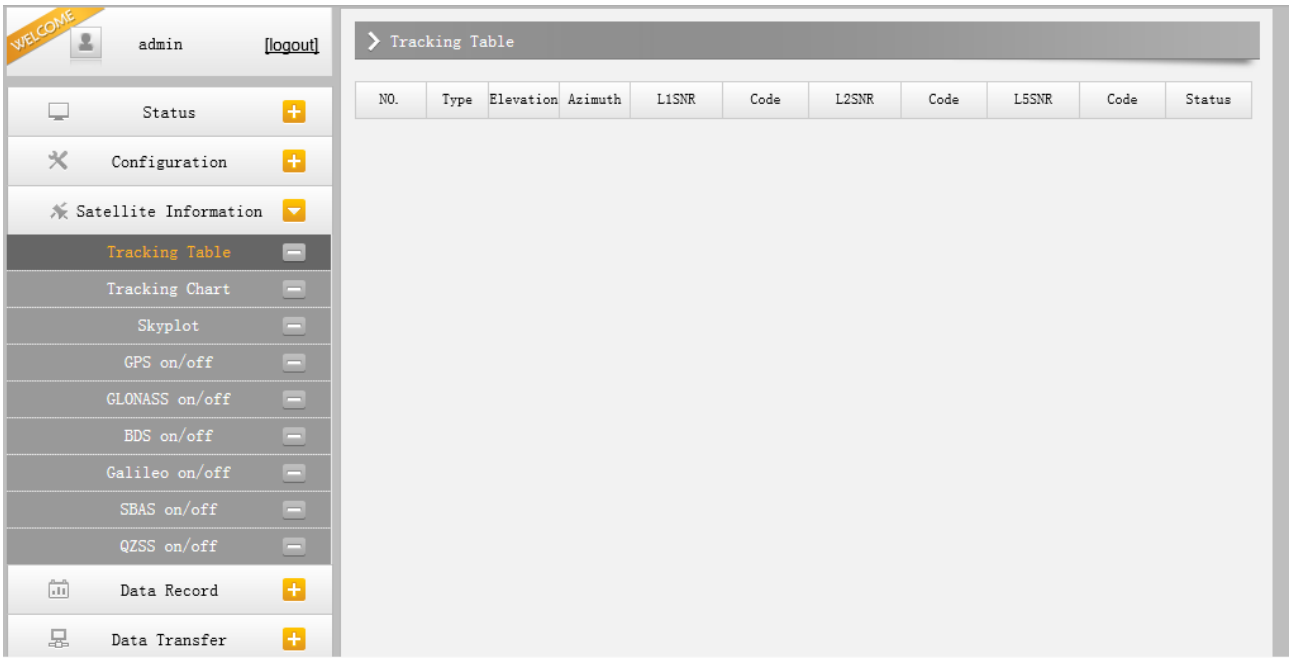


Fig. 3-11 satellite information interface

C "Data record" is as shown in figure 3-12. The user can set the data storage format, storage method, file interval, point name, epoch interval, etc; also you can query and download data. “Data download” is as shown in figure 3 - 13, after choose the storage method and date, click on “refresh data “ to download collected data or delete data.

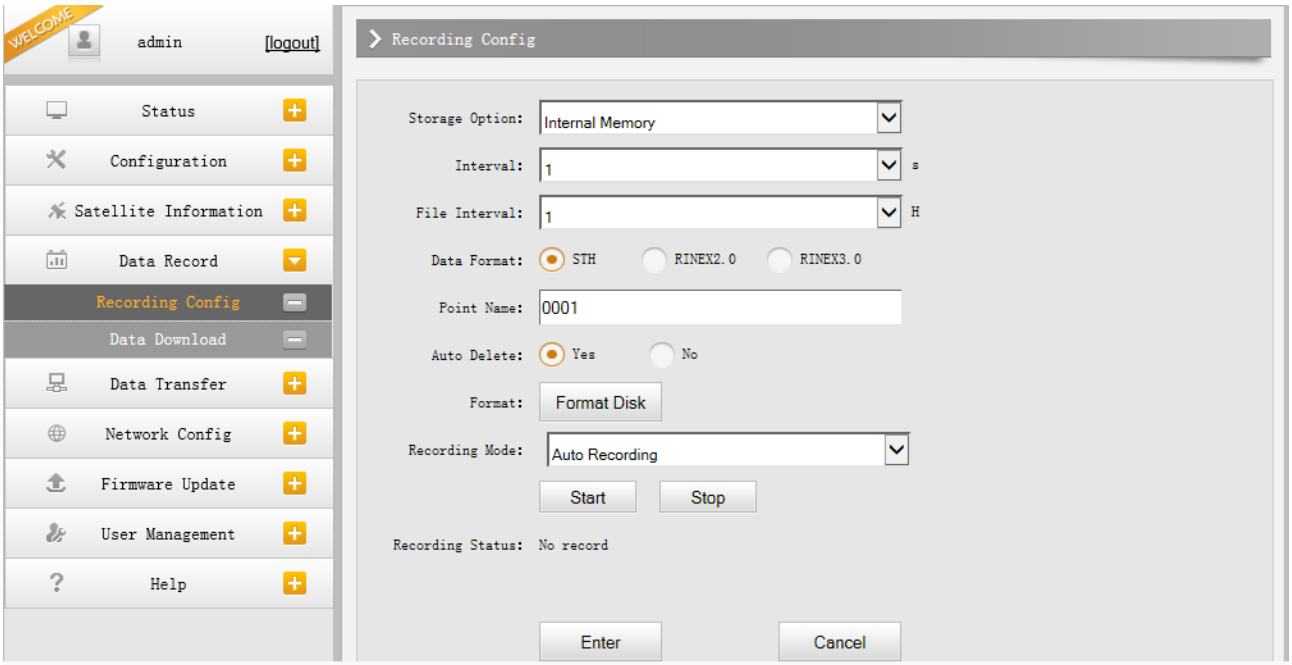


Fig. 3-12 data record interface

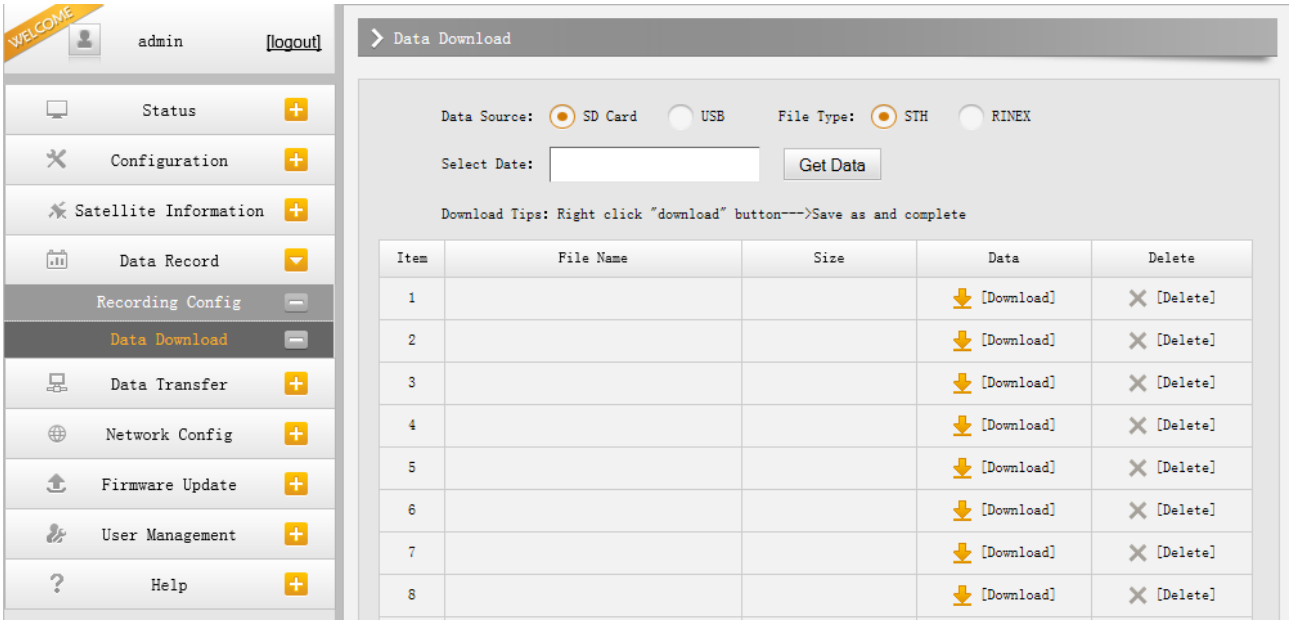


Fig. 3-13 data download interface

D "Data transfer" interface is as shown in figure 3-14. Set to transmit the raw data and differential SCMRX to the indicated IP & PORT of server.

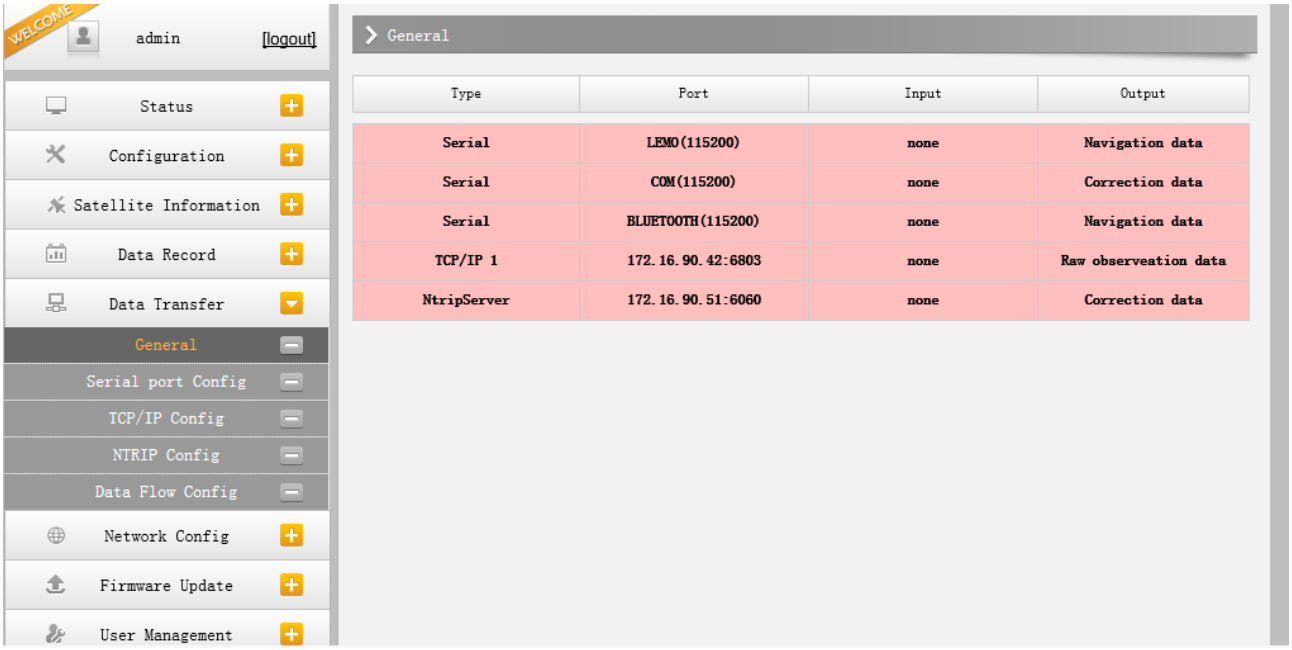


Fig.3-14 data transmission interface

a) "General" interface is as shown in figure 3-15. Lemo port, serial port, bluetooth port, raw data port and differential port display here, if there is a serial port being occupied, and then the status menu will become green as shown in figure 3-16.

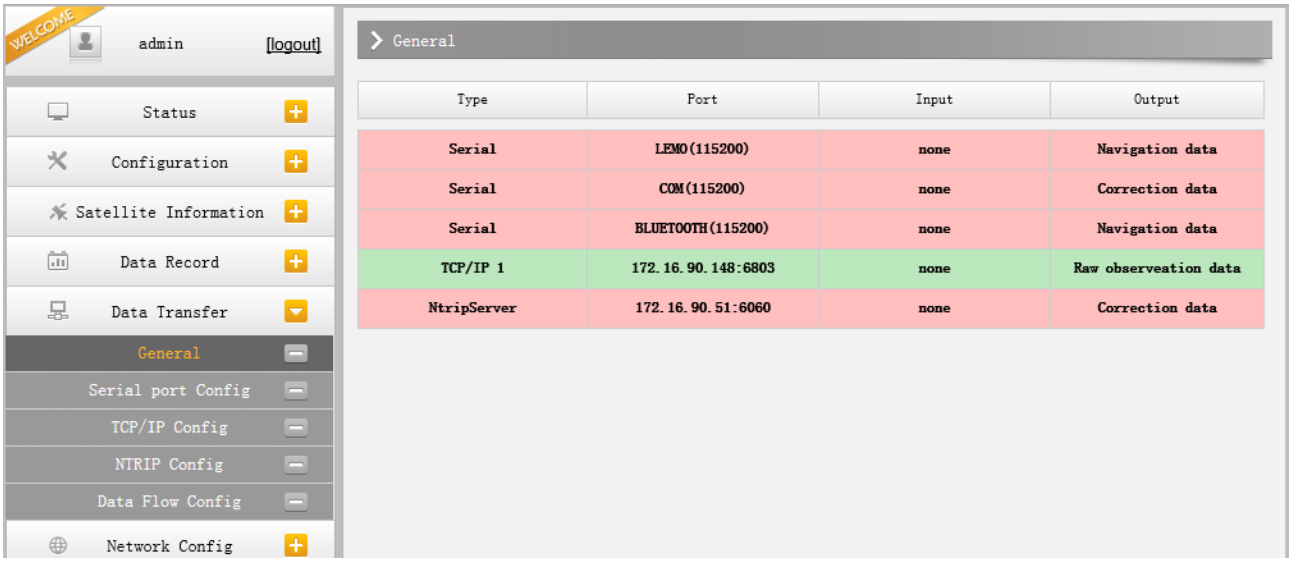


Fig. 3-15 occupied port

b) "Serial port config" interface is as shown in figure 3-16. Baud rate is 115200; odd/even is

none; there are four kinds of data in ‘data flow’, raw observation data (RT-27), correction data(SCMRX), navigation data (NMEA-0183) and SIC observation data.

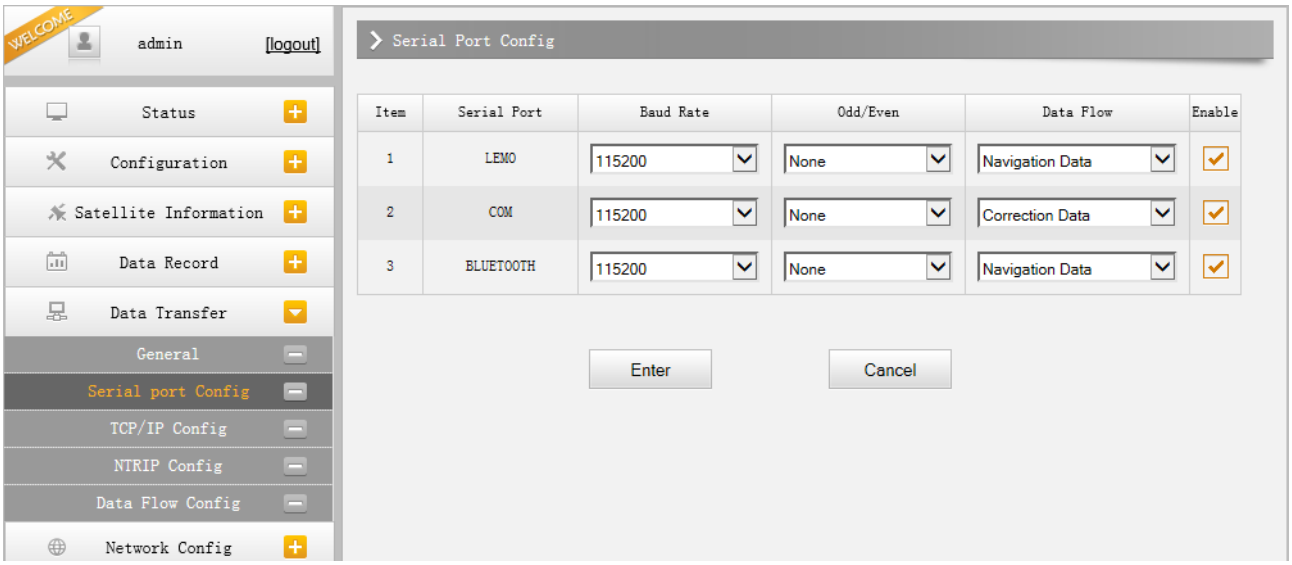


Fig. 3-16 serial port config interface

c) "TCP/IP config" interface is as shown in figure 3 -17. Select the needed work mode and data flow, set the ip and port which matched with server and enable it.

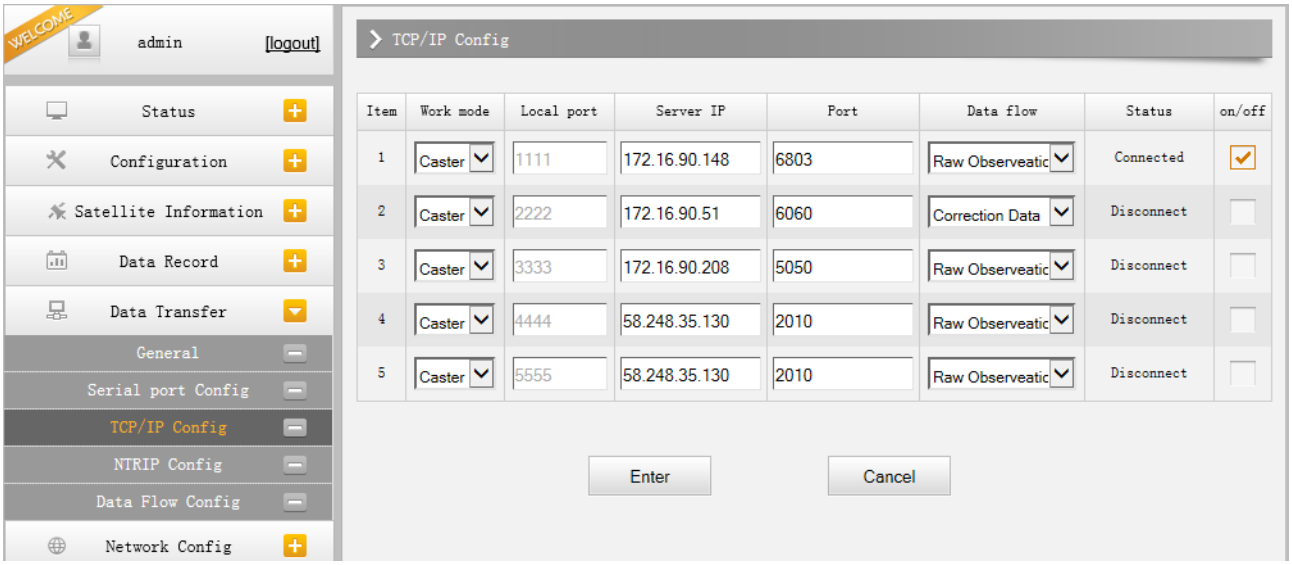


Figure 3-17 TCP/IP config interface

d) "NTRIP config" interface is as shown in figure 3-18. Select ‘active’ to enable the Ntripserver function, set the IP and Port in Ntripcaster address and NtripCaster port to

transmit correction data (SCMRX).

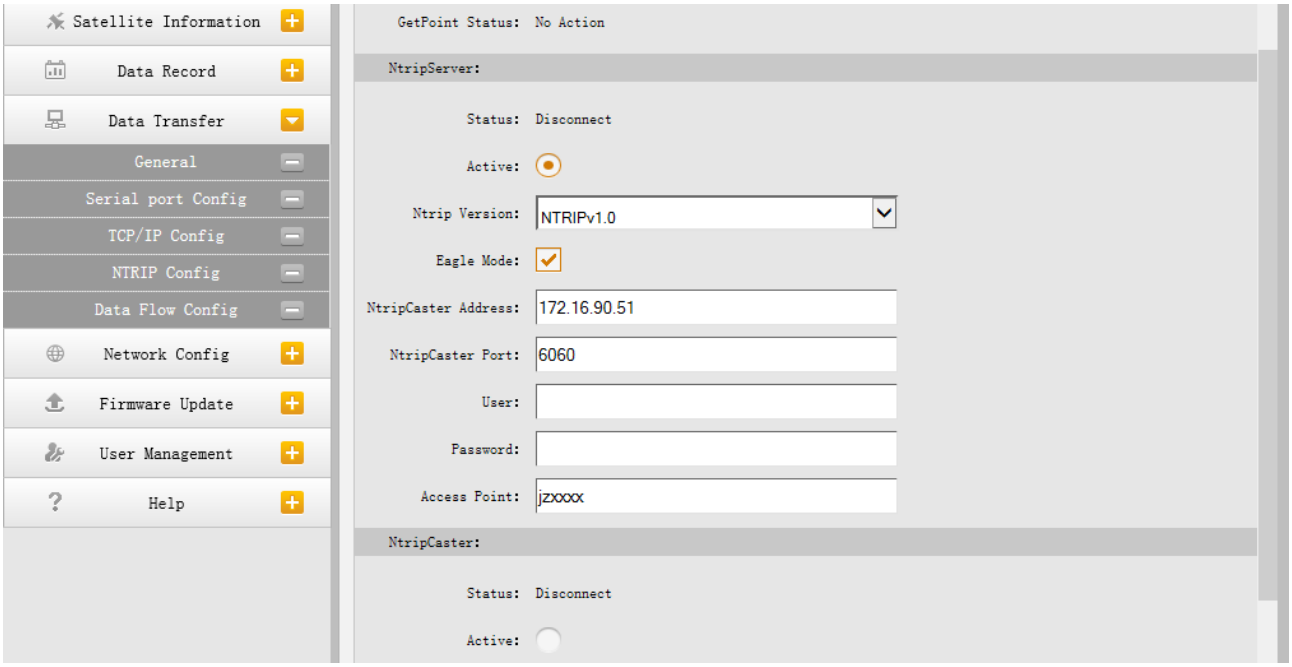


Fig. 3 -18 NTRIP config interface

e) "Data flow config" interface is as shown in figure 3-19. Here in ‘navigation data’ interface, you can set the NMEA-0183 data output frequency; in ‘SIC navigation data’, you can disable /enable the data output; in ‘raw observation data’, you can set the output parameters as it list for you; Met-Tilt is for Meteorological applications.

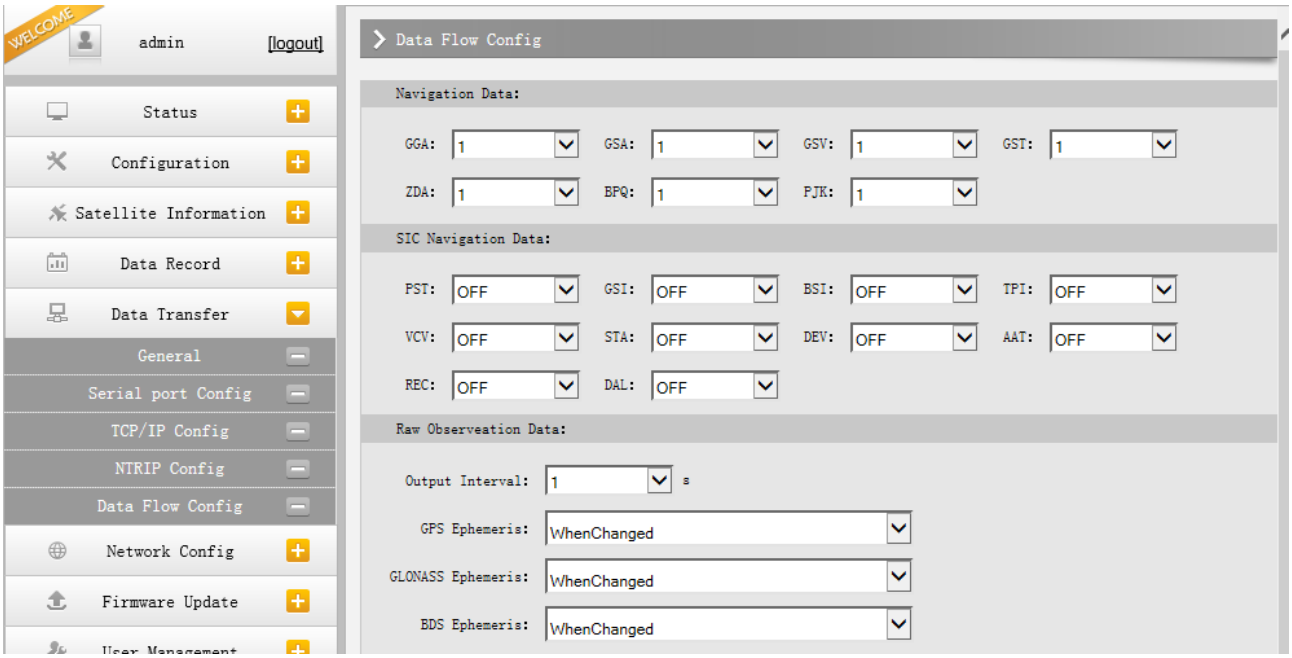


Fig. 3-19 data flow config interface

E "Network config" interface is as shown in figure 3-20. Including Ethernet config, WIFI config and Bluetooth config.

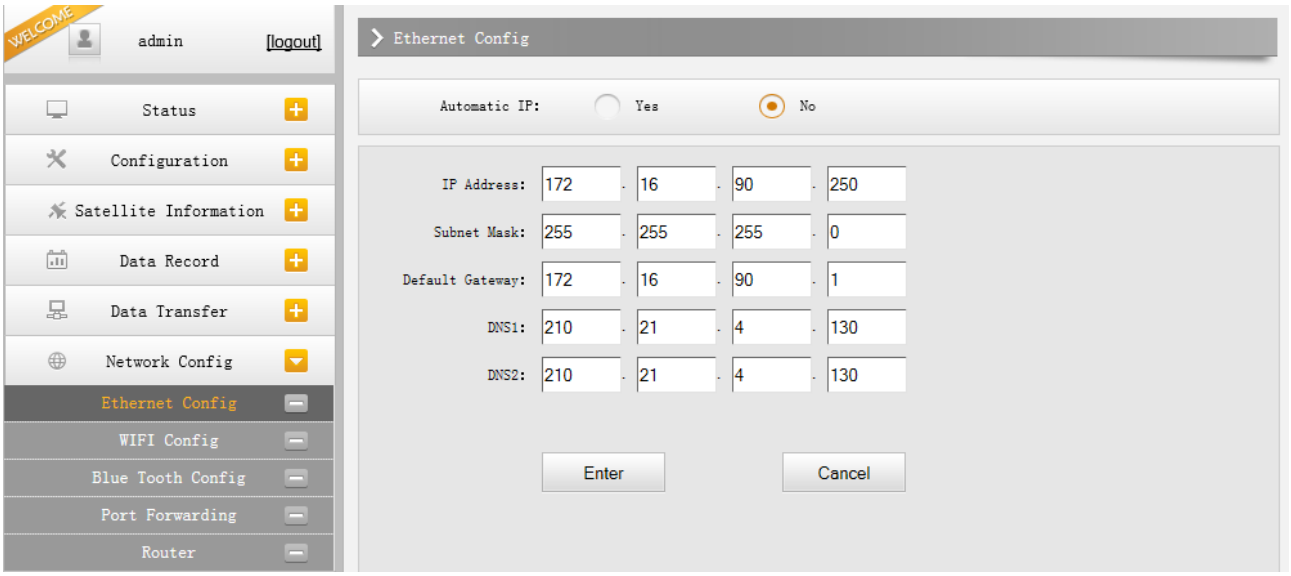


Fig. 3-20 network config interface

a)"Ethernet Settings" interface is as shown in figure 3-20. Users select no 'automatically obtain IP', they can set the receiver network parameters manually. IP address, subnet mask

and default gateway must be matched with the server's for data transmission. And when DNS was input correctly, we can access to receiver through the network.

b)"WIFI config" interface is as shown in figure 3-21. Here we Choose 'AP' as work mode; AP_SSID is the host name; AP_Password is the password for connecting to the host and you do not need a password to login when the AP is not encrypted.

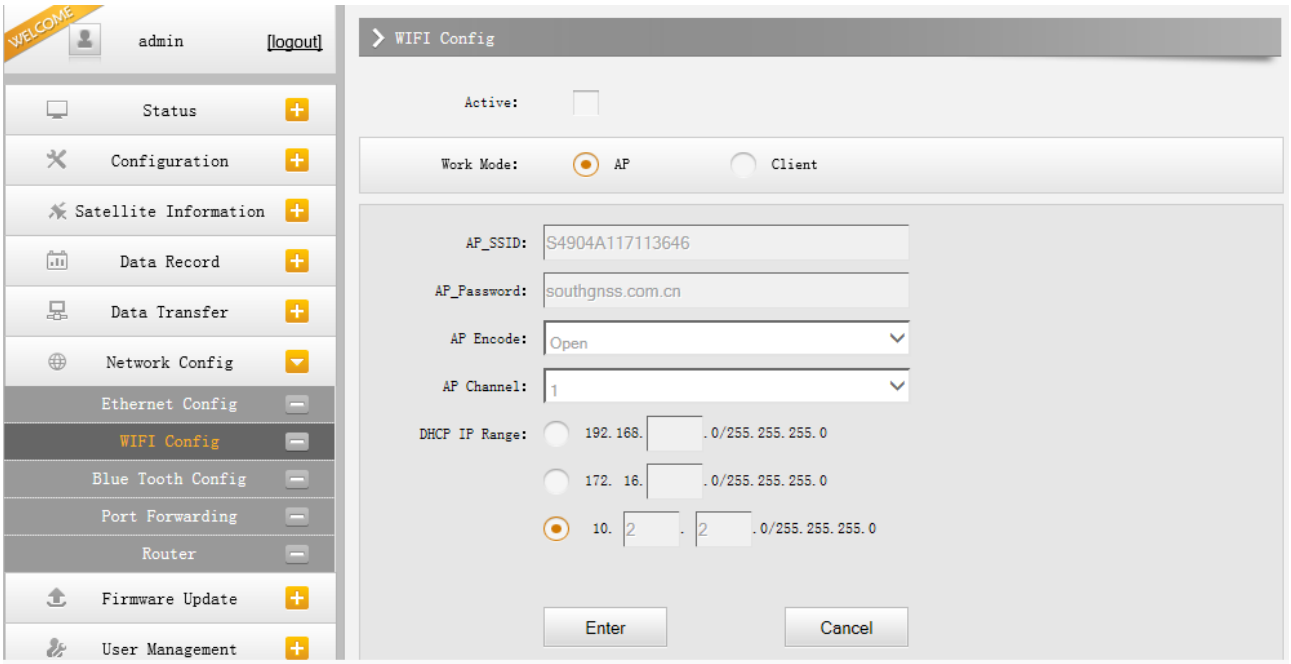


Fig. 3-21 WIFI config interface

F "Firmware update" interface is as shown in figure 3-22. The version information shows the current firmware information and release date information. Browse the firmware then upload it to upgrade. The latest firmware of receiver download at www.southgnss.com/ download center/software download/CORS software//firmware.

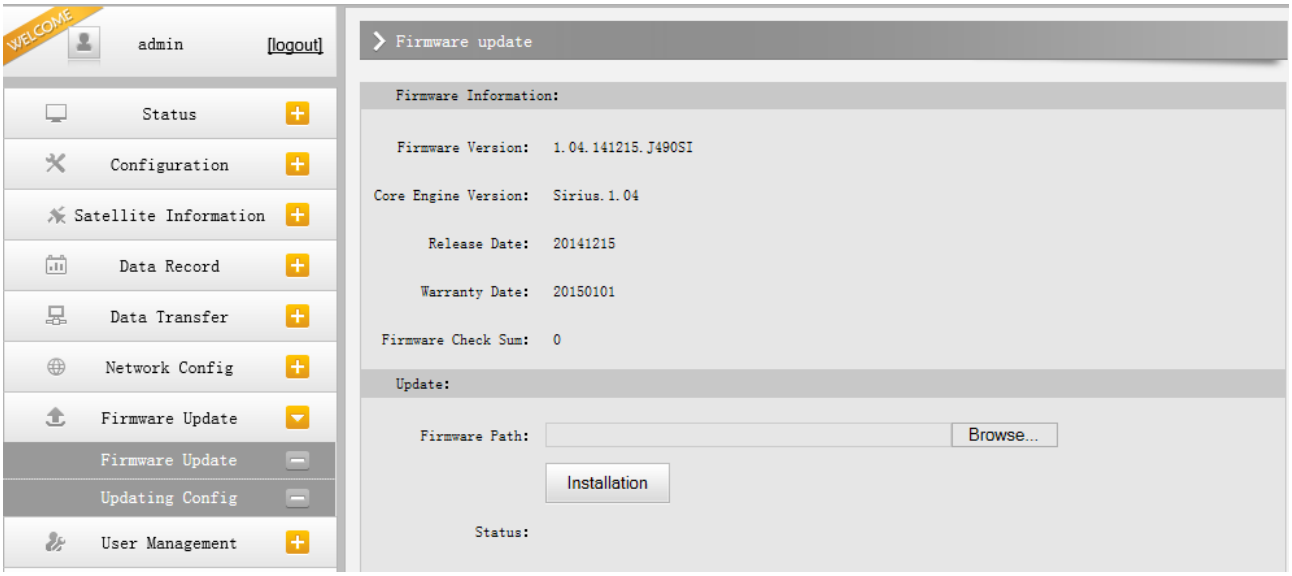


Fig. 3-22 firmware upgrade interface

G "User management" interface is as shown in figure 3 -23. It is used for adding and managing account. Only the administrator can change any parameters of the receiver and manage users; and ordinary users can only view the receiver parameters, but cannot do any changes.

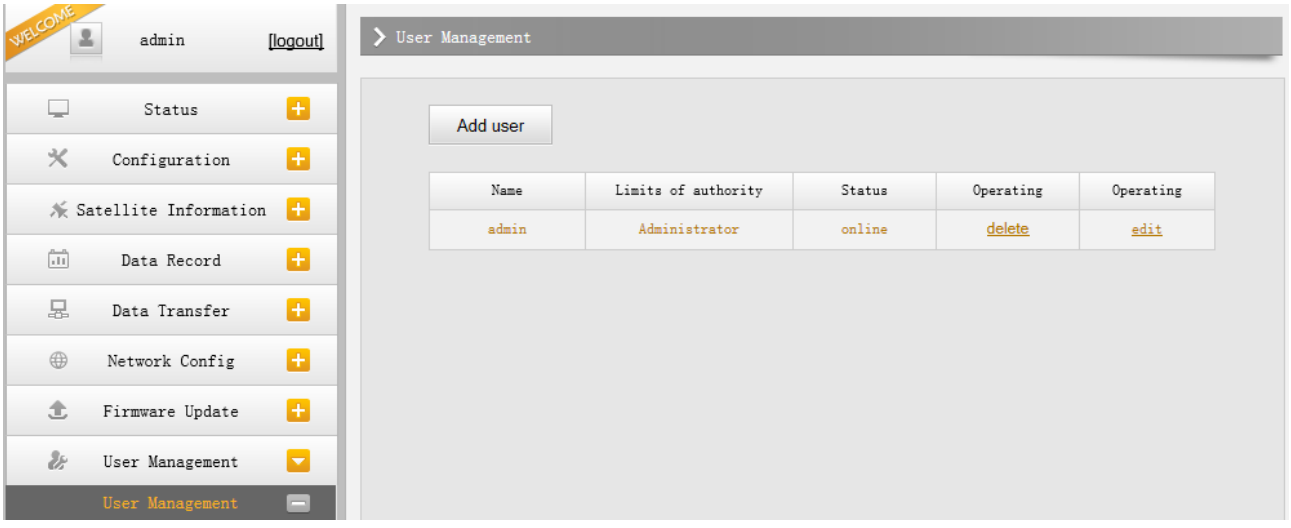


Fig. 3-23 user management interface

3.2.2 Login Web Server by the public network

If users need to remote login web server, they need to map the LAN 80 port of NetS9 to WAN port. Assuming that the port 80 is mapped to port 8000, users only need to input public IP and port into the local browser, eg: if the receiver public IP is 222.196.35.76, users only need input: http:// 222.196.35.76:8000 to access web server of NET S9.

Chapter4 NETS9 single station configuration

4.1 NRS Station setup

4.1.1 Add new stations

Add a new station

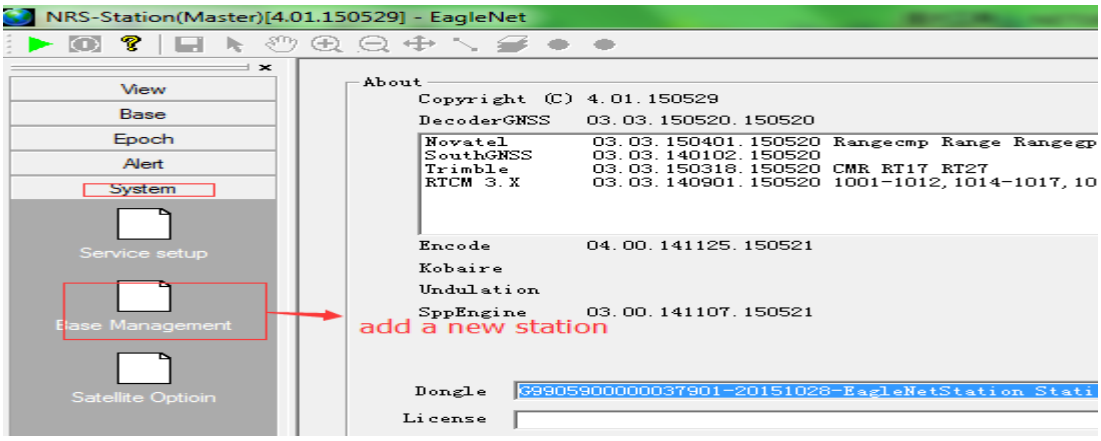


Fig. 4-1 new station

Follow the Figure 4-2 to complete the station configurations;

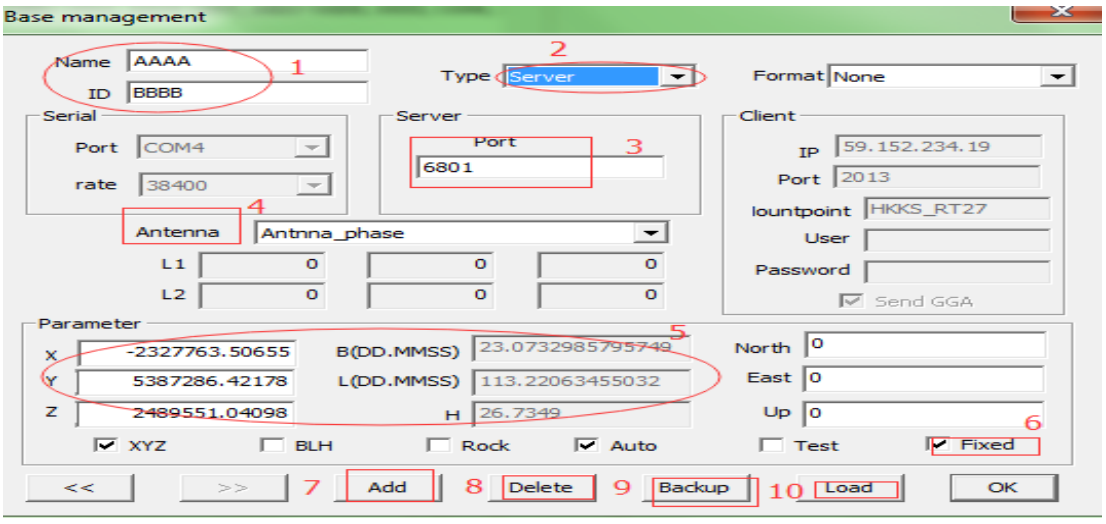


Fig. 4-2 station parameters configuration

1. Name/ID: Edit a new name and ID for stations.
2. Type: Data transmission method.
3. Server: Communication port.
4. Antenna: Antenna type selection.
5. Parameter: Coordinate input, must be XYZ or BLH.
6. Fixed: Select it as a fixed base coordinate.
7. Add: Add a new station.
8. Delete: Delete station.
9. Backup: Backup stations, in case you need configure it again.
10. Load the backup file.

4.1.2 Service setup

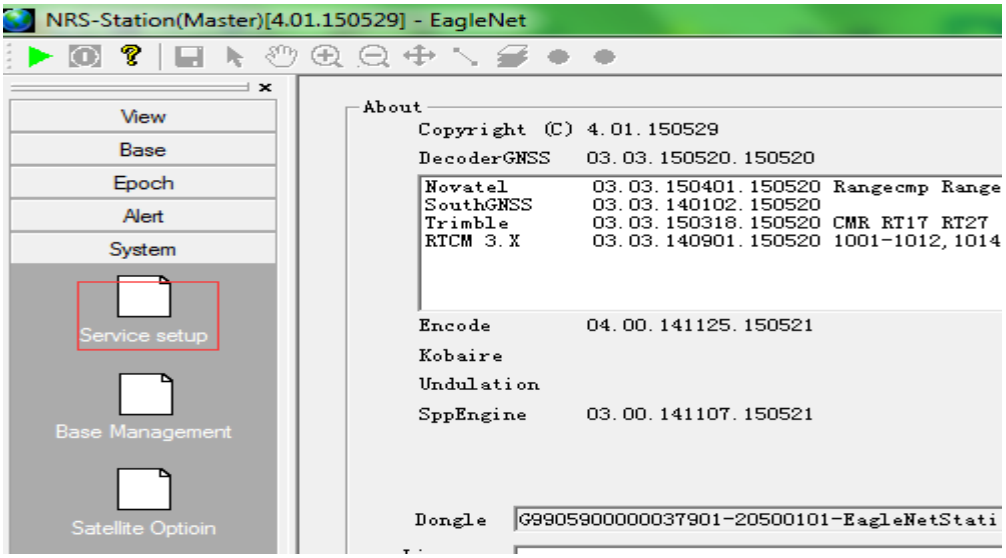


Fig. 4-3 services setup

Follow the Figure4-3 to complete services setup;

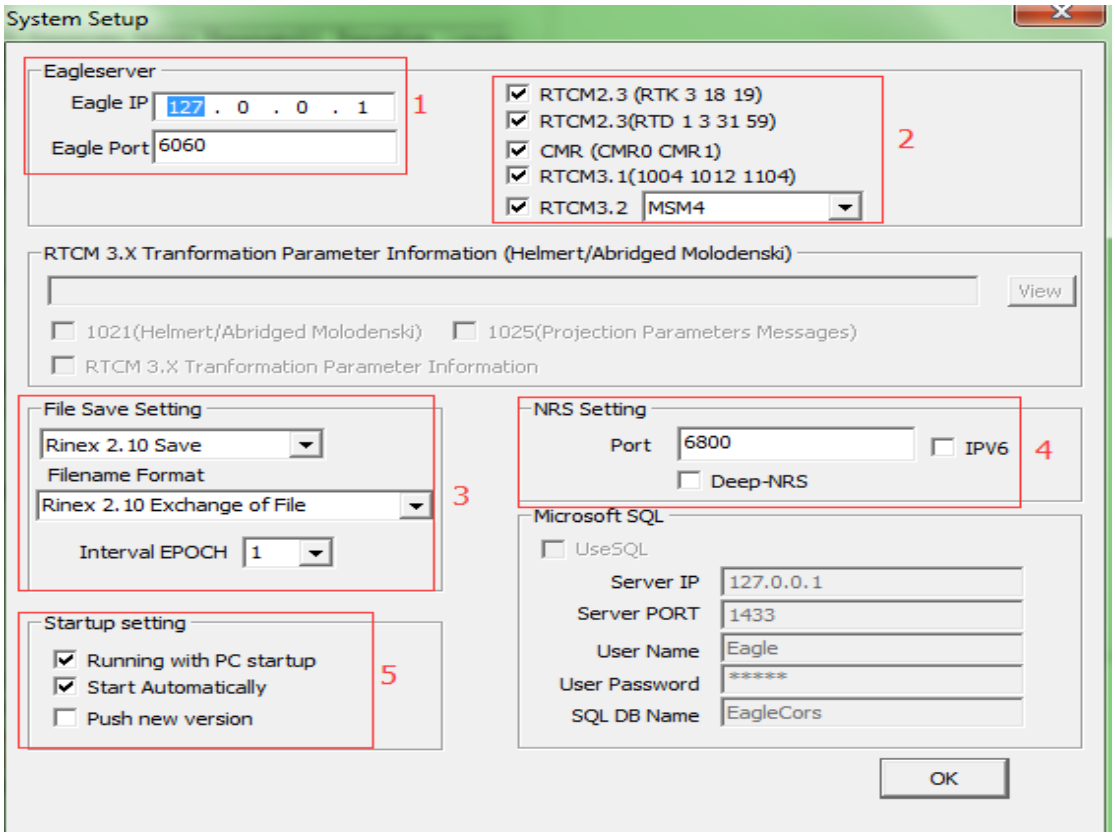


Fig. 4-4 services setup

1.Eagleserver: Communication IP & PORT between station and server software, if the NRS station and NRS server are installed in same PC, the inner IP should be 127.0.0.1.

2.Differential type: Standard differential options.

3.File save setting: setup the static data format and the storage format, also the epoch.

4.NRS setting: Set the port for transmitting the virtual differential to server software.

5.Startup setting: Setting startup items.

4.2 NRS Server setup

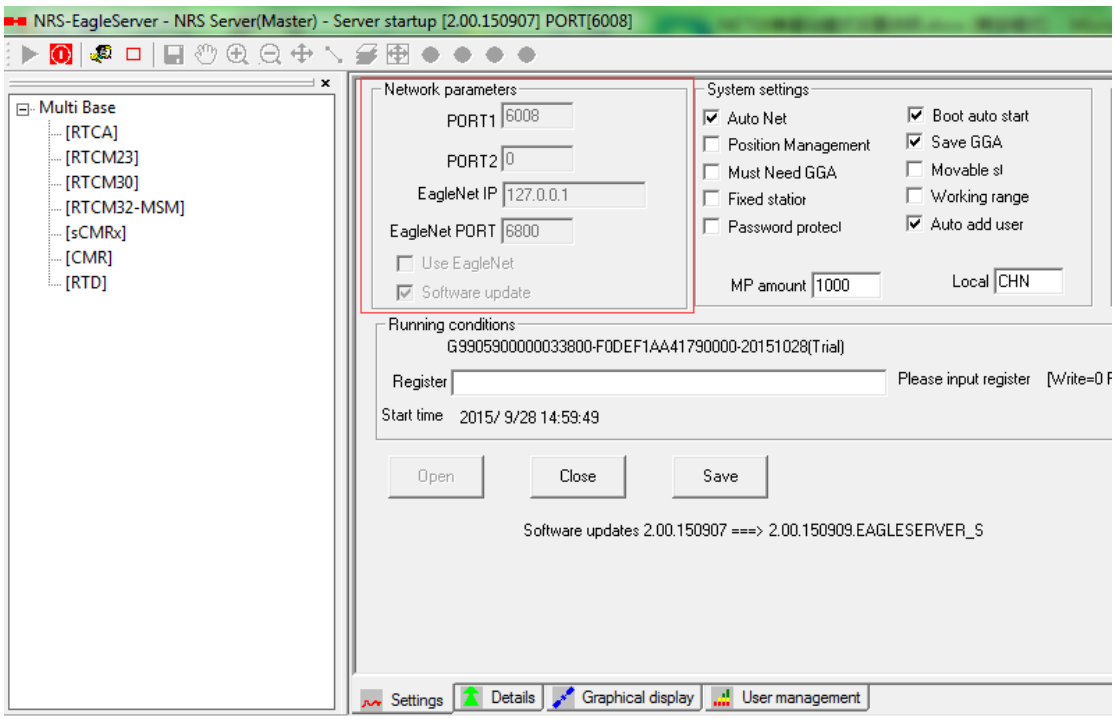


Fig. 4-5 NRS Server setup

Here we just setup the port to achieve the differential which processed by NRS station software. The PORT1 should be same with the PORT you set in NRS station “services setup’-“eagle server”, as Figure 4-4 (item 1). Eaglenet IP& PORT is for network CORS, and the inner IP is 127.0.0.1, the PORT should be same with the PORT you set in NRS station “NRS setting”, see Figure 4-4 (item 4). After setup everything, just save the settings and run it.

4.3 NETS9 configuration

4.3.1 NetS9 network connection

Power on, manually modify the network parameters through the control panel or WIFI connection.

You can also automatically obtain IP address, but for the convenience of explanation, here server (PC) IP address is 192.168.6.6, NET S9 connect to server (PC) through router, the NET S9 IP is 192.168.6.10.

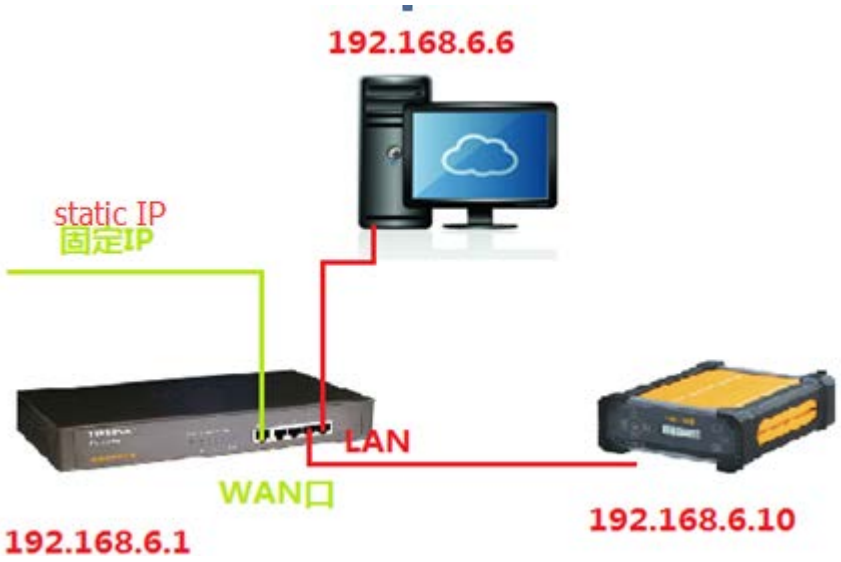


Fig. 4-6 NETS9 networking topology

1. Router setup

Taking TP-LINK as an example, the router IP set to 192.168.6.1, the login ID & password should be provided by supplier. LAN setting as Figure 4-7:

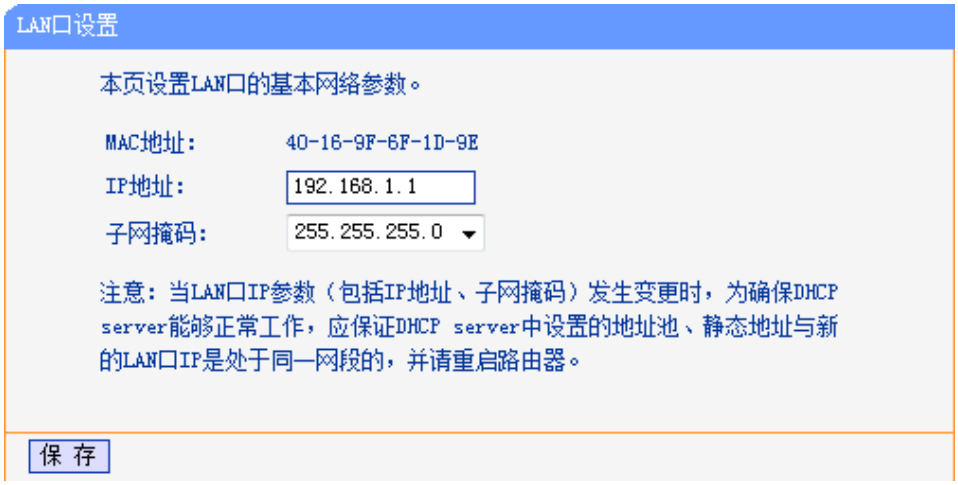


Fig. 4-7 LAN setting

WAN setting should be set according to the parameters which supplied by the carrier, as Figure 4-8:

Fig. 4-8 WAN setting

2. server(PC) networking parameters setting

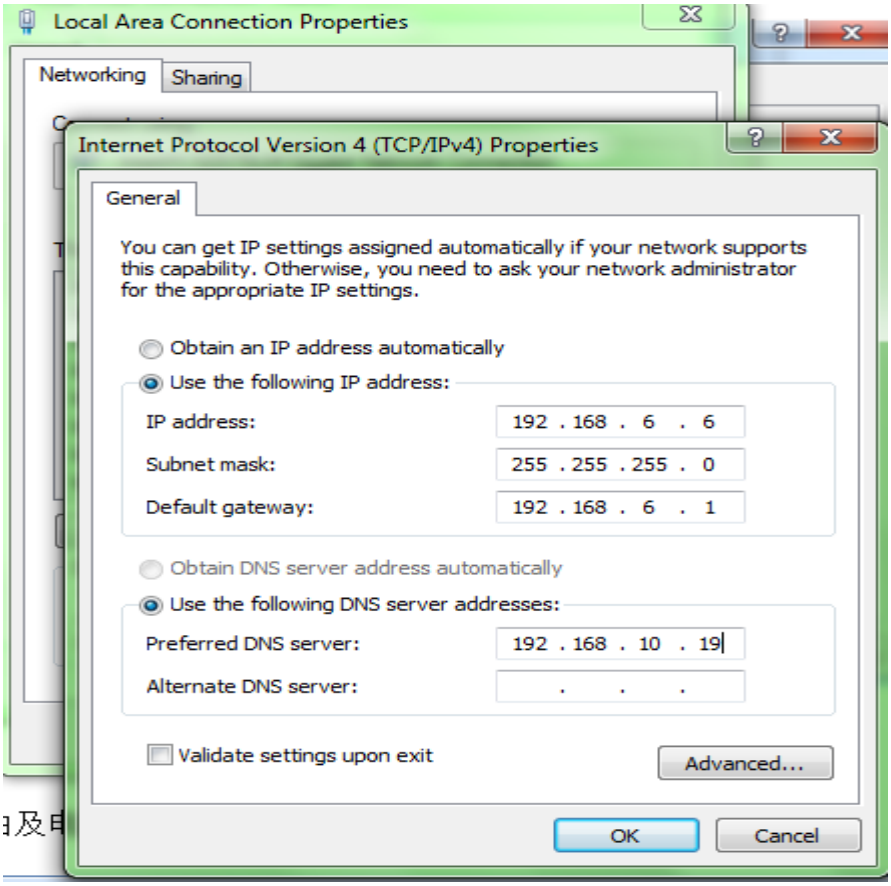


Fig. 4-9 PC setting

Set the parameters like above Figure and the DNS server IP should be according to the one which provided by carrier.

3. Configure NETS9 via WIFI

NETS9 has WIFI hotspot, while your PC, mobile and tablet can connect to it and configure it more conveniently.

This is the WIFI default factory settings of NETS9:

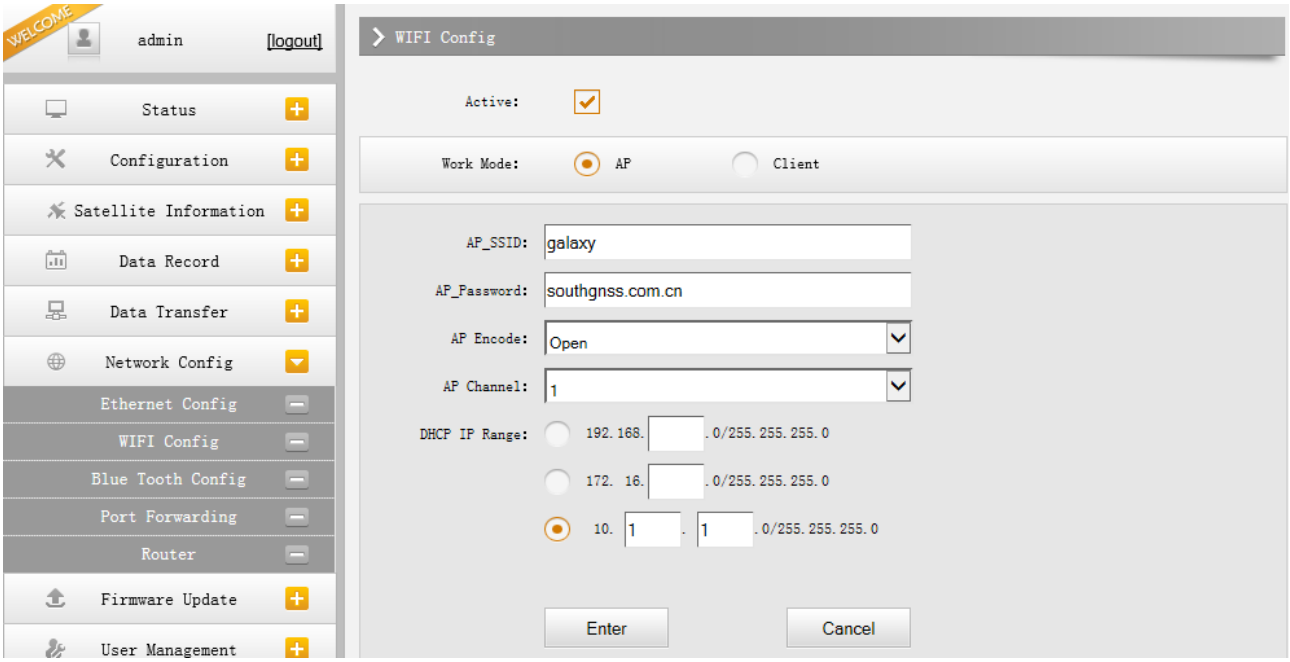


Fig. 4-10 NETS9 WIFI default setting

The factory default is no restriction for access. Computer, tablet or smart phones and other terminals can be connected directly to “galaxy” hotspot without password.

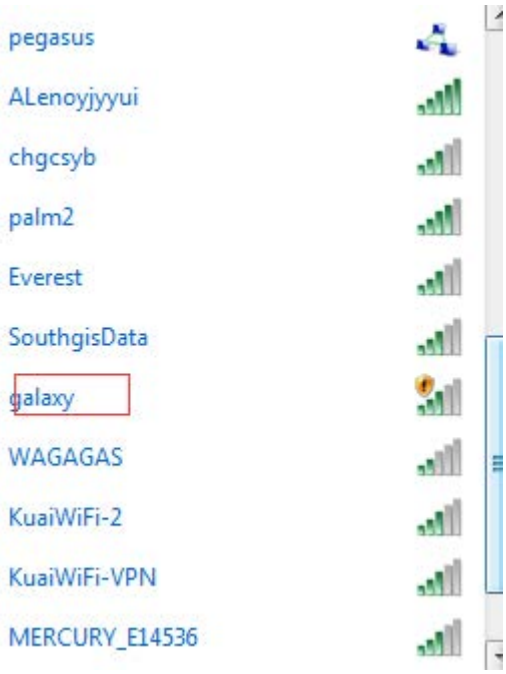


Fig. 4-11 NETS9 default SSID

Input 10.1.1.1 into browser to enter into the NETS9 web server to setup it after connected.

Login Username: admin, password: admin.

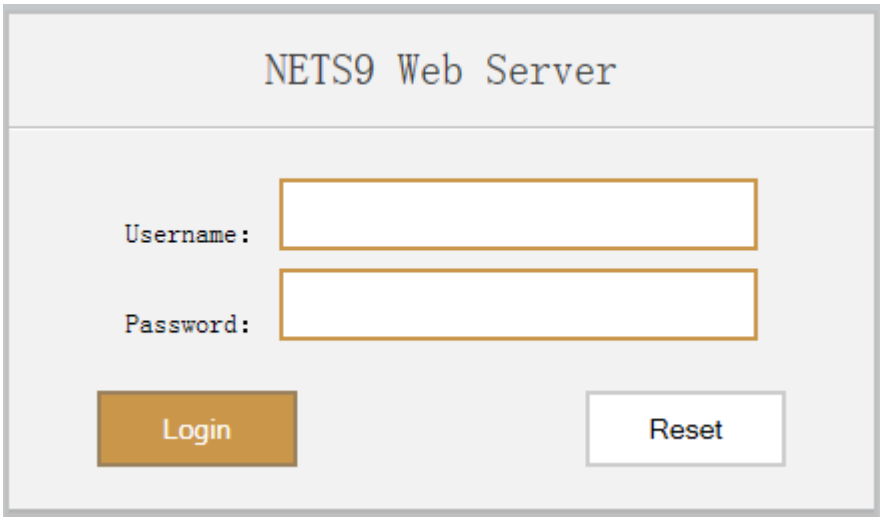


Fig. 4-12 NETS9 login interface

4.3.2 Network settings

Set the network parameters after login the web server interface:

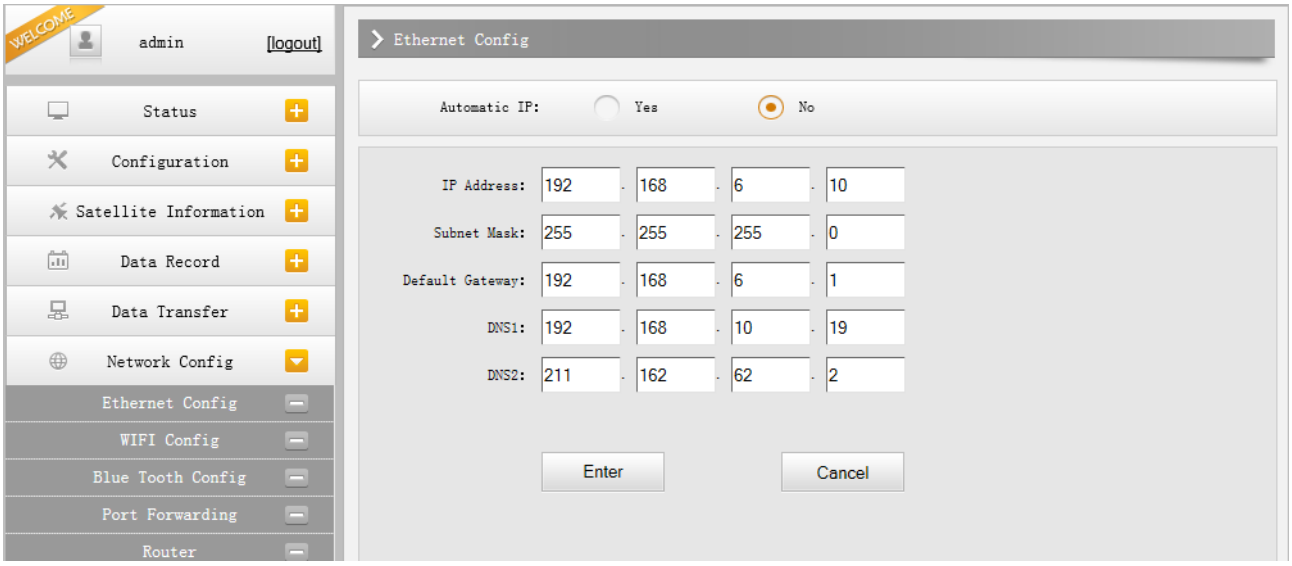


Fig. 4-13 NETS9 network parameters setting

4.3.3 Reference station setting

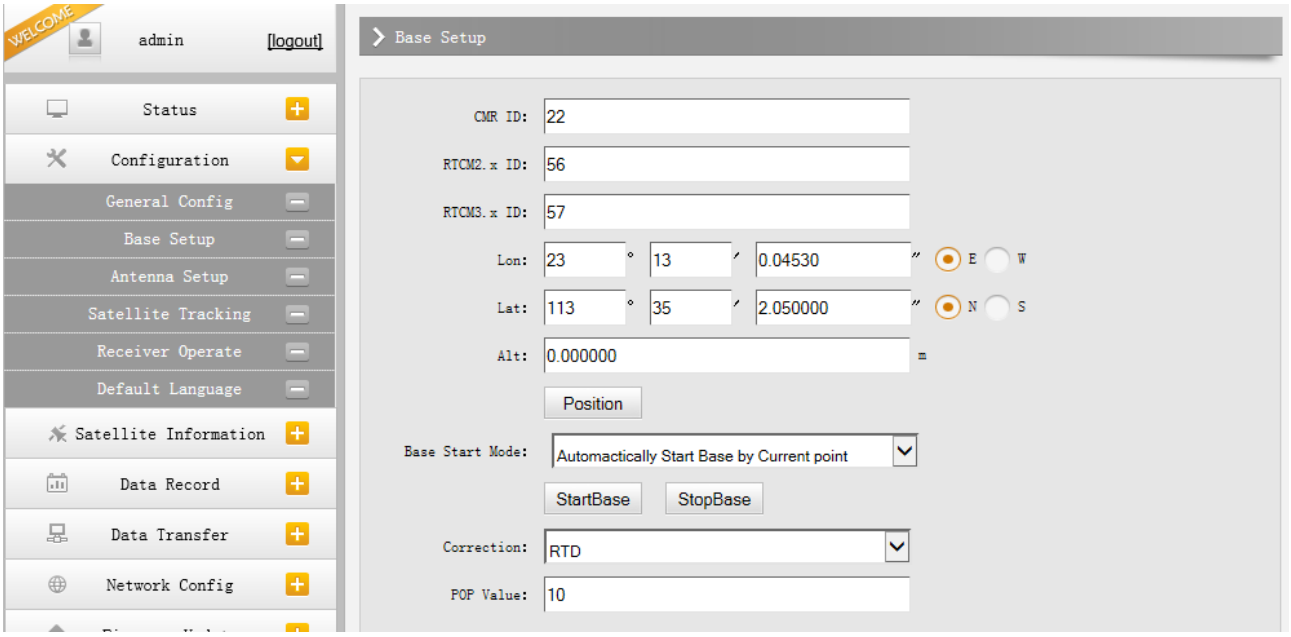


Fig. 4-14 reference station settings

Only base station coordinate need to be edited, the other settings can be kept default. Submit all settings when done.

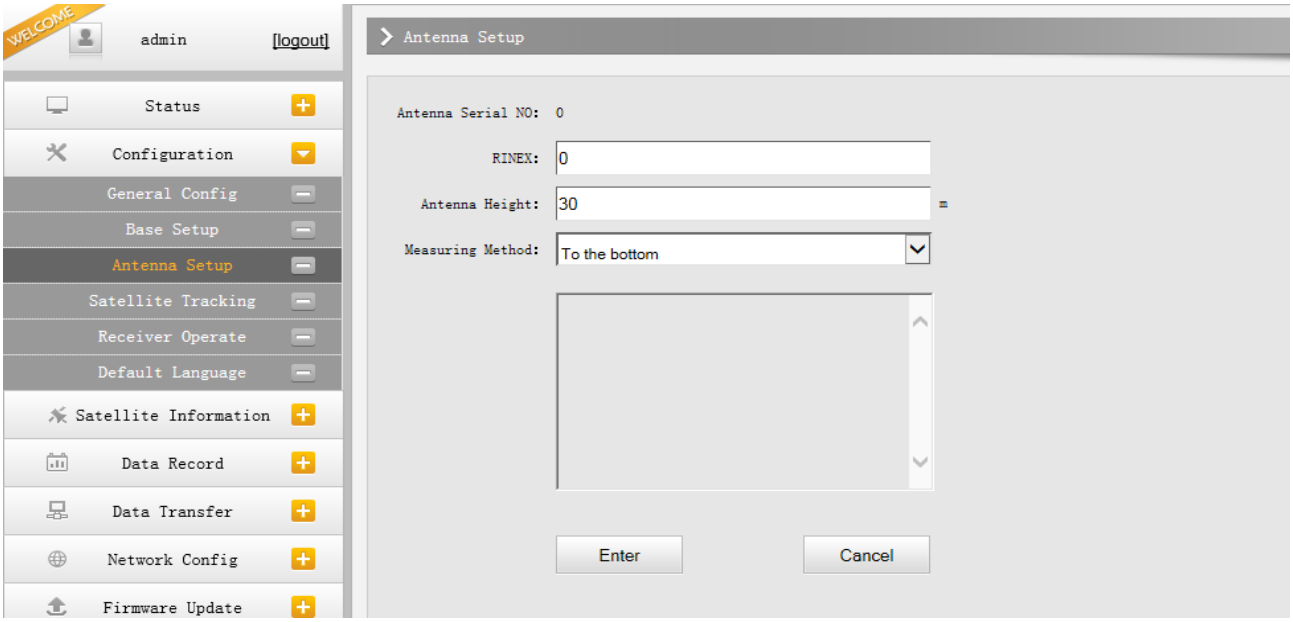


Fig. 4-15 antenna parameters setting

4.3.4 Data recording setting

There are several options for each item which you can set every parameter according to the actual demand.

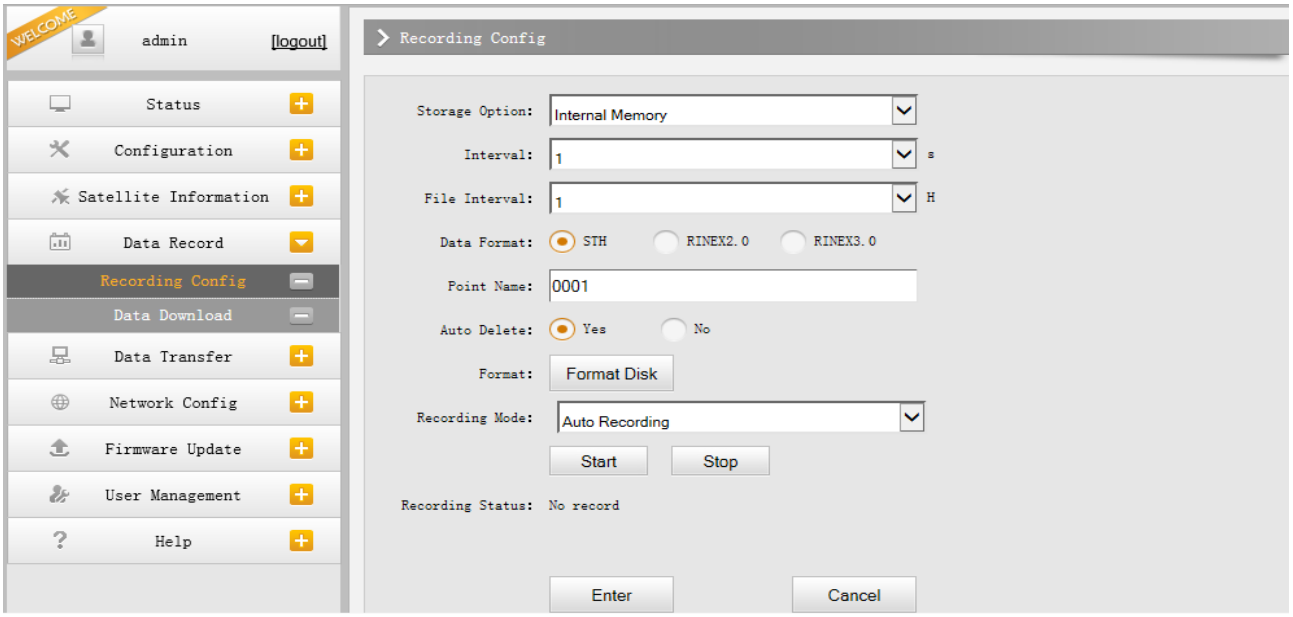


Fig. 4-16 data recording setting

4.3.5 Data transmission

Mode should be set to client mode which means here the receiver provides the raw data. And the raw data should be sent out with an indicated IP & PORT. The IP is where your eaglestation is installed and Port should be set to the same Port as your eagelstation server port. Pls check Figure 4-2 (item 3).

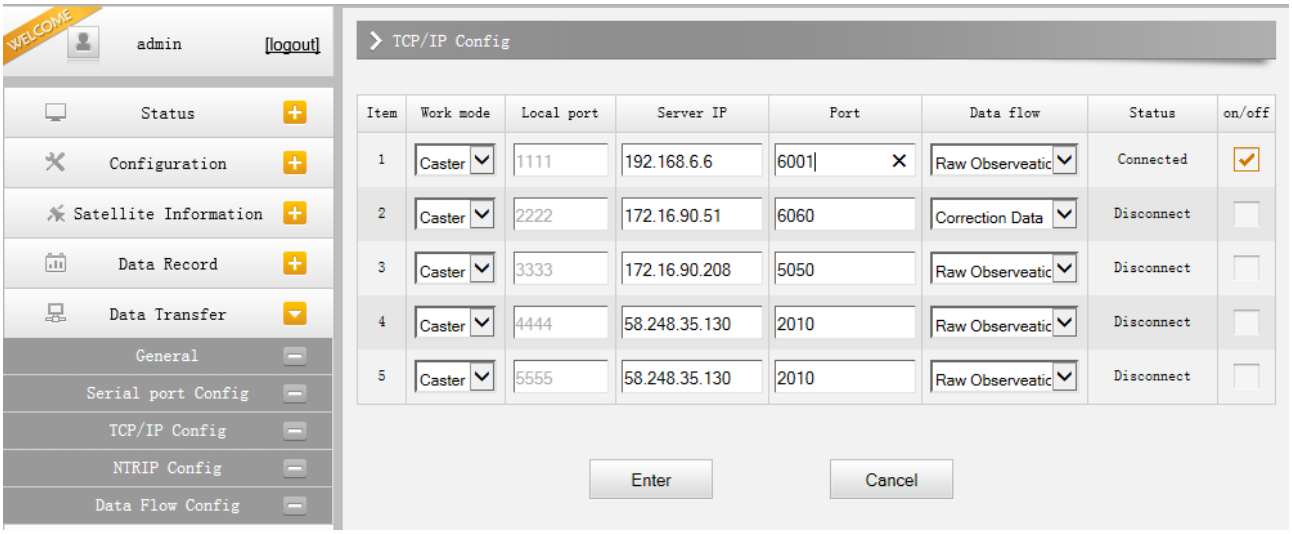


Fig. 4-17 data transmission setting

4.3.6 Broadcast SCMRX

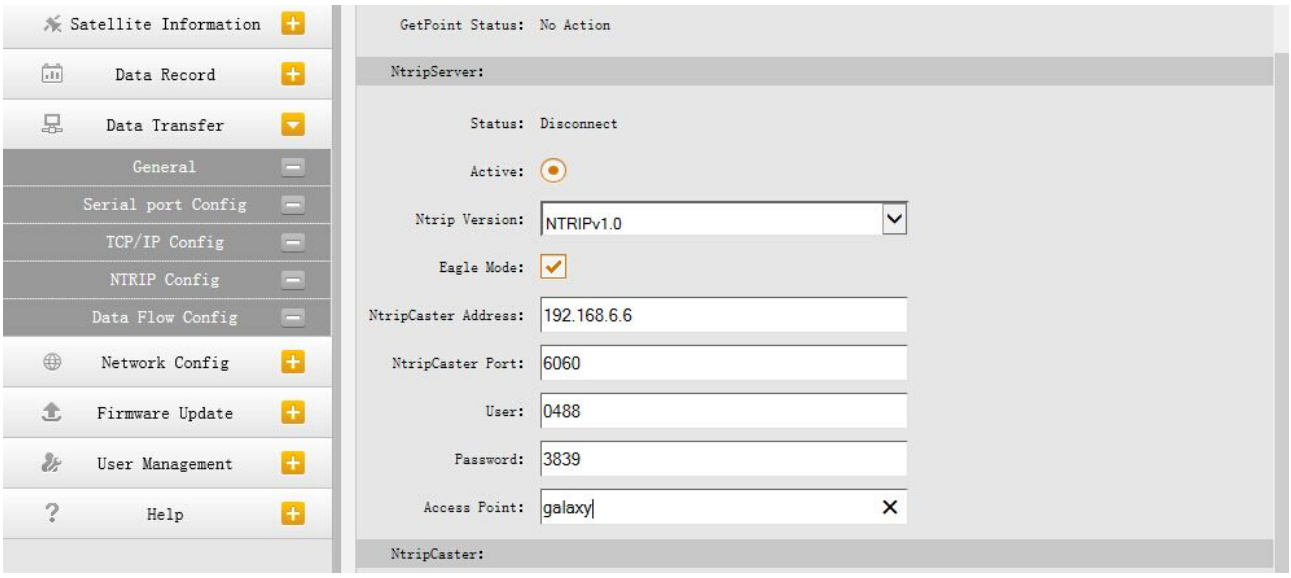


Fig. 4-18 scmrx transmission setting

S9 can create scmrx (with BDS) directly which no need to be processed so that it can be sent to eagleserver directly. Eagleserver can broadcast this correction to users directly.

‘Open’ this service and select ‘eagle’ mode.

The caster address should be the IP where the eagleserver is installed and the PORT should be the same as your eagleserver PORT. See Figure 4-18

4.4 NRS normal status

4.4.1 Station normal status

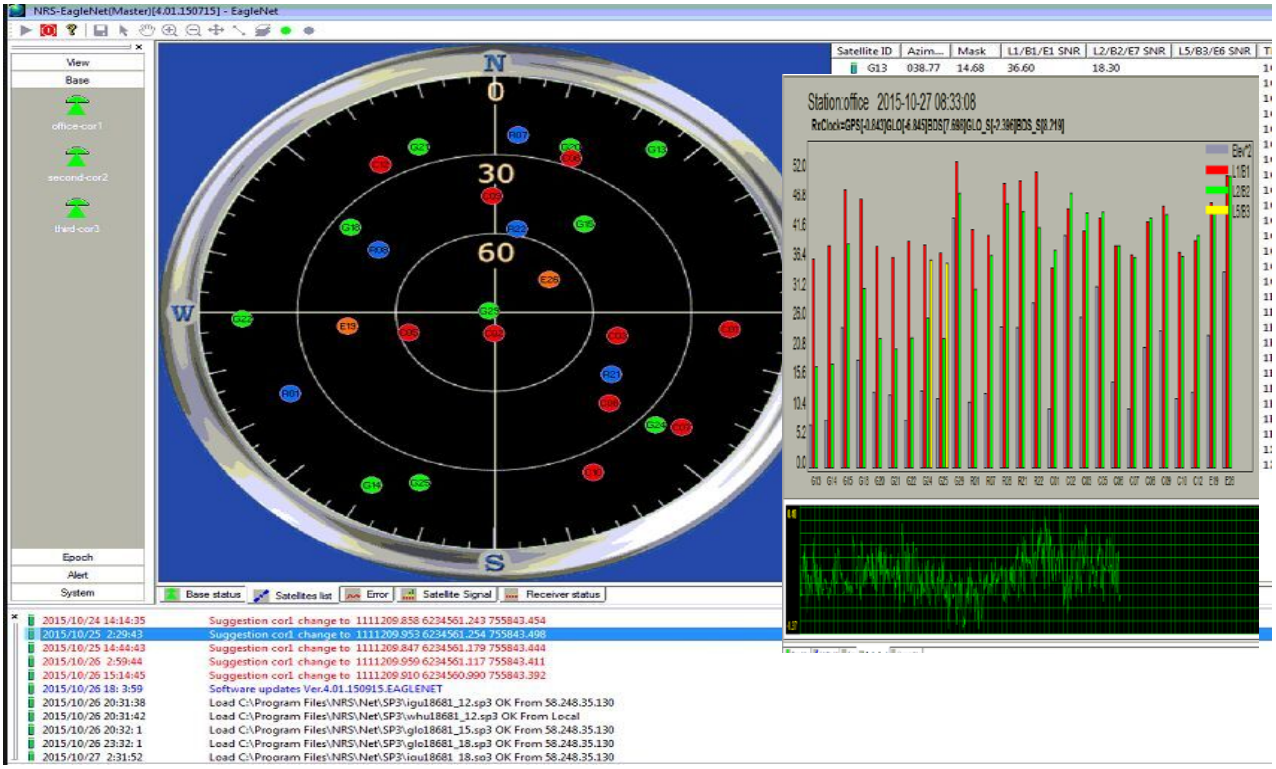


Fig. 4-19 station display

4.4.2 Server normal status

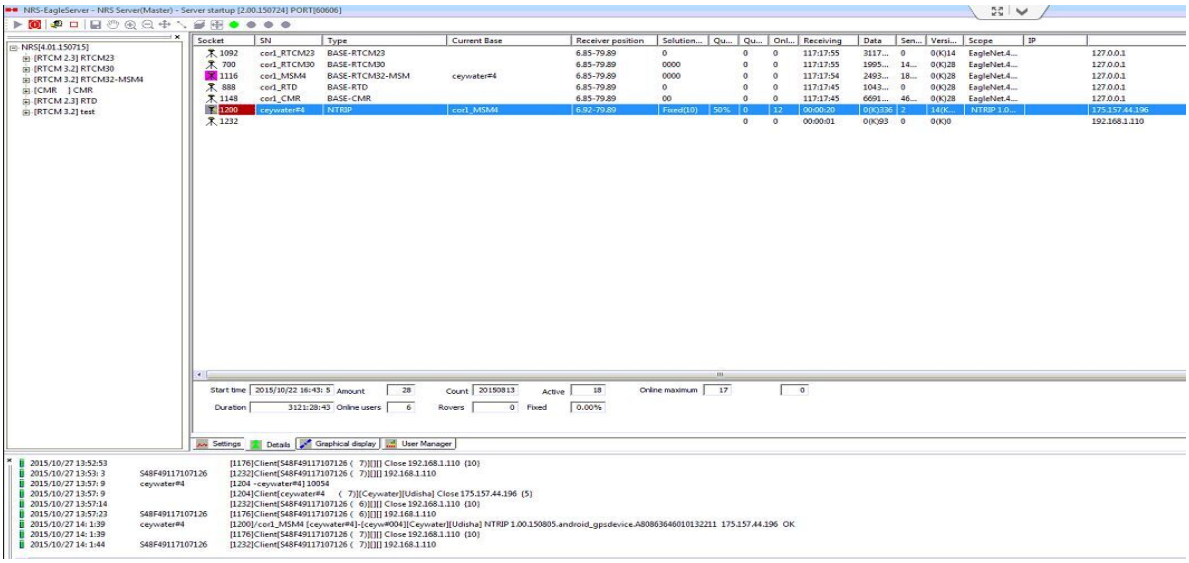


Fig. 4-20 server display

4.5 Port mapping

Every router should have the ability that can map the port. The procedure is making the sever LAN IP & PORT to the WAN IP & PORT so that the users can access even if it is in a different network area. The function is also called NAT (network address transformation) for some routers.

Here taking the TP-LINK router as an example to show you how to do port mapping.

Fig. 4-21 port mapping configuration

Server Port: The port you need map (6060).

IP: Local server IP (192.168.6.6).

The other settings keep default.

After completing the port mapping, type the WAN IP+PORT (eg: 58.248.35.130:6060) into browser, it means port mapping succeed when getting the source table.

```
SOURCETABLE 200 OK Server: EagleGnss-basic/150918 Date: 2015/10/15 15:39:10 Content-Type: text/plain Content-Length: 2349 STR;RTCM23;RTCM23;RTCM 2.3;3(10),18
(1),19(1);2;GNSS;EagleGnss;CHN;0.00;0.00;1;1;NRS1.150906;none;B;N;19200; STR;RTCM30;RTCM30;RTCM 3.2;1004(1),1012(1),1104(1),1005(10),1007(15),1033
(7);2;GNSS;EagleGnss;CHN;0.00;0.00;1;1;NRS1.150906;none;B;N;19200; STR;RTCM32-MSM4;RTCM32-MSM4;RTCM 3.2;1074(1),1084(1),1124(1),1005(10),1007(15),1033
(7);2;GNSS;EagleGnss;CHN;0.00;0.00;1;1;NRS1.150906;none;B;N;19200; STR;CMR;CMR;CMR +;CMR0(1),CMR1
(10);2;GNSS;EagleGnss;CHN;0.00;0.00;1;1;NRS1.150906;none;B;N;9600; STR;RTD;RTD;RTCM 2.3;1(1),3(10),31(1),59
(1);2;GNSS;EagleGnss;CHN;0.00;0.00;1;1;NRS1.150906;none;B;N;19200; STR;RTCM32;RTCM32;RTCM 3.2;1074(1),1084(1),1124(1),1005(10),1007(15),1033
(7);2;GNSS;EagleGnss;CHN;0.00;0.00;1;1;NRS1.150906;none;B;N;19200; STR;S48153121119911;S48153121119911;RTCM 3.2;1074(1),1084(1),1124(1),1005
(10);2;GNSS;EagleGnss;CHN;23.11;113.44;1;0;NRS8B150826;none;B;N;9600; STR;0800_RTD;0800_RTD;RTD;1(1),3
(1);2;GNSS;EagleGnss;CHN;23.11;113.44;1;0;NRS00000106;none;B;N;9600; STR;S48F38107083365;S48F38107083365;sCMRx;CMR1(1),CMR
(0);2;GNSS;EagleGnss;CHN;33.66;116.53;1;0;NRS8B141208;none;B;N;9600; STR;2000_RTCM30;2000_RTCM30;RTCM 3.0;1004(1),1012(1),1005(10),1021
(5);2;GNSS;EagleGnss;CHN;22.96;113.43;1;0;NRS00000106;none;B;N;9600; STR;2000_MSM4;2000_MSM4;RTCM 3.2;1074(1),1084(1),1124(1),1005(10),1021
(5);2;GNSS;EagleGnss;CHN;22.96;113.43;1;0;NRS00000106;none;B;N;9600; STR;0800_MSM4;0800_MSM4;RTCM 3.2;1074(1),1084(1),1124(1),1005(10),1021
(5);2;GNSS;EagleGnss;CHN;23.11;113.44;1;0;NRS00000106;none;B;N;9600; STR;0800SCMRX;0800SCMRX;RTD;1(1),3
(1);2;GNSS;EagleGnss;CHN;0.00;0.00;1;0;NRS17113655;none;B;N;9600; STR;2000SCMRX;2000SCMRX;sCMRx;CMR1(1),CMR
(0);2;GNSS;EagleGnss;CHN;0.00;0.00;1;0;NRS17113672;none;B;N;9600; STR;S48F38107083367;S48F38107083367;sCMRx;CMR1(1),CMR
(0);2;GNSS;EagleGnss;CHN;33.53;117.03;1;0;NRS8B141208;none;B;N;9600; STR;S48139107085095;S48139107085095;sCMRx;CMR1(1),CMR
(0);2;GNSS;EagleGnss;CHN;32.73;112.17;1;0;NRS8B141208;none;B;N;9600; STR;S48F38107083364;S48F38107083364;sCMRx;CMR1(1),CMR
(0);2;GNSS;EagleGnss;CHN;33.57;116.74;1;0;NRS8B141208;none;B;N;9600; STR;0800_RTCM30;0800_RTCM30;RTCM 3.0;1004(1),1012(1),1005(10),1021
(5);2;GNSS;EagleGnss;CHN;23.11;113.44;1;0;NRS00000106;none;B;N;9600; STR;2000_RTD;2000_RTD;RTD;1(1),3
(1);2;GNSS;EagleGnss;CHN;22.96;113.43;1;0;NRS00000106;none;B;N;9600; ENDSOURCETABLE
```

Fig. 4-22 source table list

Herby, South Surveying & Mapping Technology Co., Ltd. declares that this GNSS RECEIVER, NET S9 is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.
In accordance with Article 10(2) and Article 10(10), this product allowed to be used in all EU member states.
Use the GNSS RECEIVER in the environment with the temperature between -20℃ and 45℃.
The device complies with RF specifications when the device used at 20cm from your body.
Adapter shall be installed near the equipment and shall be easily accessible.
The plug considered as disconnect device of adapter
Adapter Manufacturer: : South Surveying & Mapping Technology Co., Ltd.
Model: ZL-030HL1802000CN01
Input: 100-240V~, 50/60Hz, 1.0A
Output: 18V2.0V

Specifications
Hardware Version: SIRIUS500
Software Version: 1.09.200703.R4A5GL

Emission Information

Technology	Frequency		Emission Designator	RF Power	Field Strength
	From	To			
BT	2402MHz	2480MHz	F1D/G1D	4.93dBm(EIRP)	
BLE	2402MHz	2480MHz	F1D/G1D	2.57dBm(EIRP)	
2.4GWIFI	2412MHz	2472MHz	D1D/G1D	13.45dBm(EIRP)	
GSM 900	880MHz	915MHz	GXW/G7W	32.68dBm (Conducted)	
GSM 1800	1710MHz	1785MHz	GXW/G7W	29.83dBm (Conducted)	
WCDMA Band I	1920MHz	1980MHz	F9W	23.24dBm (Conducted)	
WCDMA Band VIII	880MHz	915MHz	F9W	23.26dBm (Conducted)	
LTE Band 1	1920MHz	1980MHz	G7D/W7D	23.14dBm (Conducted)	
LTE Band 3	1710MHz	1785MHz	G7D/W7D	22.82dBm (Conducted)	
LTE Band 7	2500MHz	2570MHz	G7D/W7D	23.88dBm (Conducted)	
LTE Band 8	880MHz	915MHz	G7D/W7D	23.35dBm (Conducted)	
LTE Band 20	832MHz	862MHz	G7D/W7D	22.83dBm (Conducted)	
LTE Band 38	2570MHz	2620MHz	G7D/W7D	23.66dBm (Conducted)	
LTE Band 40	2300MHz	2400MHz	G7D/W7D	23.92dBm (Conducted)	
GPS	1575.42MHz	1575.42MHz	/	/	

Manufacturer:South Surveying & Mapping Technology Co., Ltd.
Address:No.39, Sicheng Road, Tian He District, Guangzhou, China

FCC Warning

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any inte rference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interferenceto radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.