NET10 GNSS Receiver

User Manual

Edition: V1.0_20210520

Statement

Please read carefully:

Thank you very much for purchasing our product. For instructions on how to use this product, please be sure to read the user manual.

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

The information in this document is subject to change without notice; We reserve the right to change or improve its products as well the content without any obligation to notify individual or organization of such changes or improvements. For any questions, please contact the customer service center or contact our authorized dealer.

Customer safety is important. Please carefully read the precautions and instructions in the user manual. To avoid accidental damage, use only original supplied parts. If you do not use the system or connect incompatible accessories in accordance with the correct procedures, it may cause damage to the equipment and may even endanger others and your safety. In this regard, the company does not assume any responsibility.

Contents

1. Product Description

NET10 is designed as high-precision GNSS receiver. The traditional permanent reference stations have many functions and not easy for use. NET10 can be easily installed and configurate through the web user interface. Combine with the choke-ring antenna, NET10 provides stable and reliable correction data.

Main features：

- Robust housing with IP67 protection
- Support ethernet or WiFi connection
- Support Bluetooth and RS232
- Easy configuration via WebUI
- Support NTRIP Caster, server, and client mode

2. Appearance

There are four indicators on NET10: satellite, data recording, data transmitting and power supply.

3. Technical Specifications

GNSS	
Satellites Tracking	GPS: L1CA/L1P/L1C/L2P/L2C/L5 BDS: B1I/B2I/B3I/B1C/B2a/B2b/ ACEBOC GLONASS: G1/G2/G3, P1/P2 GALILEO: E1/E5a/E5b/E6/ALTBOC QZSS: L1CA/L1C/L2C/L5/LEX IRNSS: L5 SBAS[1]: L1/L5 L-Band: Atlas H10/H30/Basic
Channels	800
Signal Reacquisition	< 1 sec
Cold Start	< 60 sec
Warm Start	< 30 sec
Hot Start	< 10 sec
Initialization Reliability	> 99.9%
Update Rate	10 Hz standard, up to 20 Hz
Operation System	Linux
Internal Memory	32 GB

Performance	
High Precision Static	H: 2 mm + 0.1 ppm V: 3 mm + 0.4 ppm
Static/Fast Static	H: 2.5 mm + 0.1 ppm V: 3.5 mm + 0.4 ppm
RTK	H: 8 mm + 1 ppm V: 15 mm + 1 ppm
Code Differential	H: 0.3 m V: 0.6 m
SBAS	H: 0.3 m V: 0.6 m
L-Band	Atlas H10: 4 cm RMS Atlas H30: 15 cm RMS Atlas Basic: 30 cm RMS
1PPS	10 ns

Power Supply	
Power	2-pin DC in
Voltage	8~36 VDC with over-voltage protection

Communication	
Bluetooth	BT5.0 + EDR, compatible with BLE
WIFI	802.11 b/g/n/ac
Ethernet	Support
Port	1 x Lemo-0, 2-pin, DC in 1 x DB9 female, RS232 1 x RJ45 ethernet 1 x GNSS TNC female
Baud Rate	9600 ~ 115200 bps
Web UI	Support
NMEA Output	NMEA0183
Correction Data	RTCM2.X, RTCM3.X, CMR, CMR+, DGPS, BINEX, RAW
Data Recording	Support 8 recording simultaneously
Recording Format	Binary, RINEX, BINEX
Recording Interval[2]	2s, 5s, 10s, 15s, 30s, 60s 1 Hz, 2 Hz, 5 Hz, 10 Hz, 20 Hz
Data Stream	1 x Bluetooth 1 x Serial port 3 x NTRIP server streams 1 x NTRIP client streams 5 x Socket (TCP/UDP) streams
Smart Alert	Email alert
FTP Function	FTP server FTP client (FTP push)
NTP Server	Support
Others	DDNS, SNMPD, Firewall, VPN

Physical	
Dimension	131 x 36.5 x 97 mm
Weight	435 g
Operating Temperature	-40℃ ~ +65℃
Storage Temperature	-45℃ ~ +80℃
Water/Dust Proof	IP67
Humidity	Up to 95%
Indicators	Power, satellite, recording, datalink
Button	1 x Reset button

4. Basic Operations

- **Connect the GNSS antenna**

To receive satellite signals, NET10 needs to be connected to an external antenna with TNC port.

- **Connect the power supply**

NET10 does not have internal battery. To run the device, the external power supply is needed. Please use the original adapter to avoid any danger. Once device is connected to the 2-pin power cable, it will automatically power on. Disconnect the 2-pin power cable to power off the device.

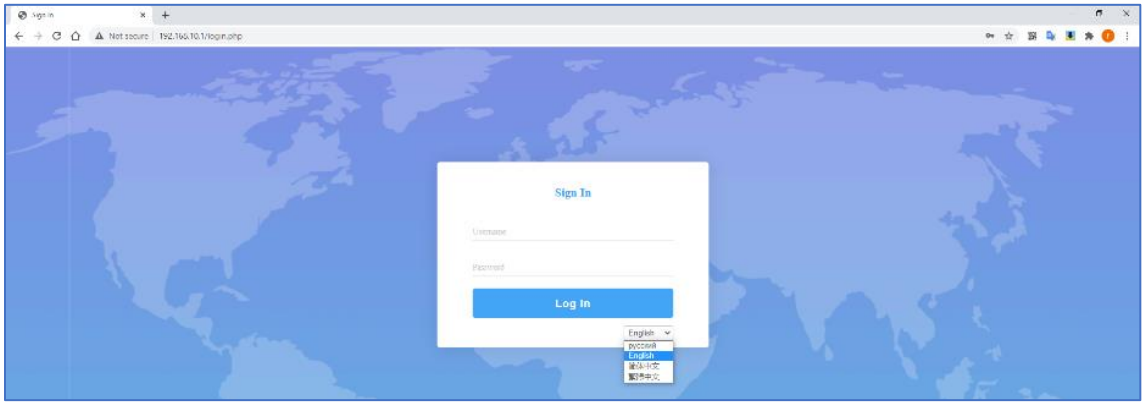
- **Reset Button**

Press the reset button 3 seconds to reset some basic settings. To reset all settings including network setting, press the reset button for 1 minutes.

5. WebUI Settings

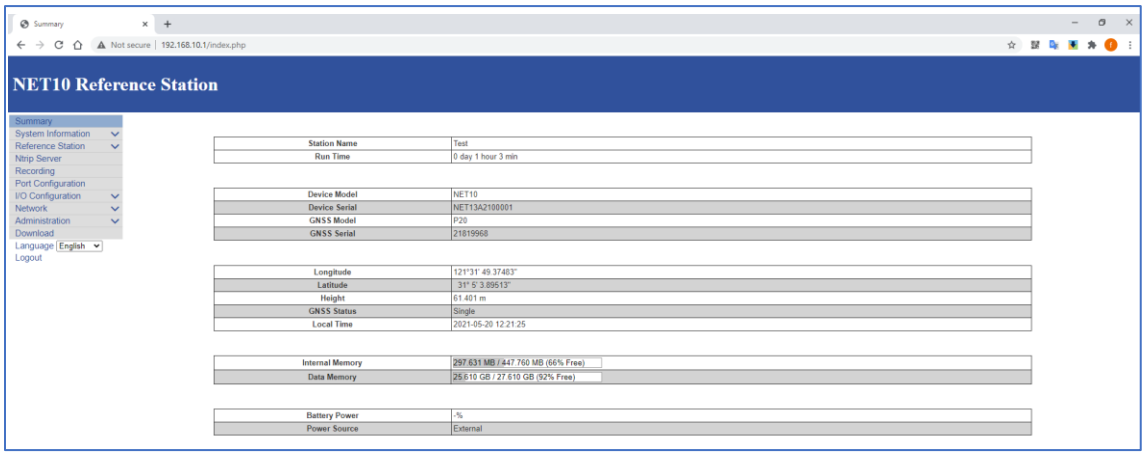
When device is powered on, use computer or tablet to search and connect the device hotspot.

Open web browser and access IP “192.168.10.1”, the username is “admin”, password is “password”. User can change the language and click “Log in” to show the Web user interface.



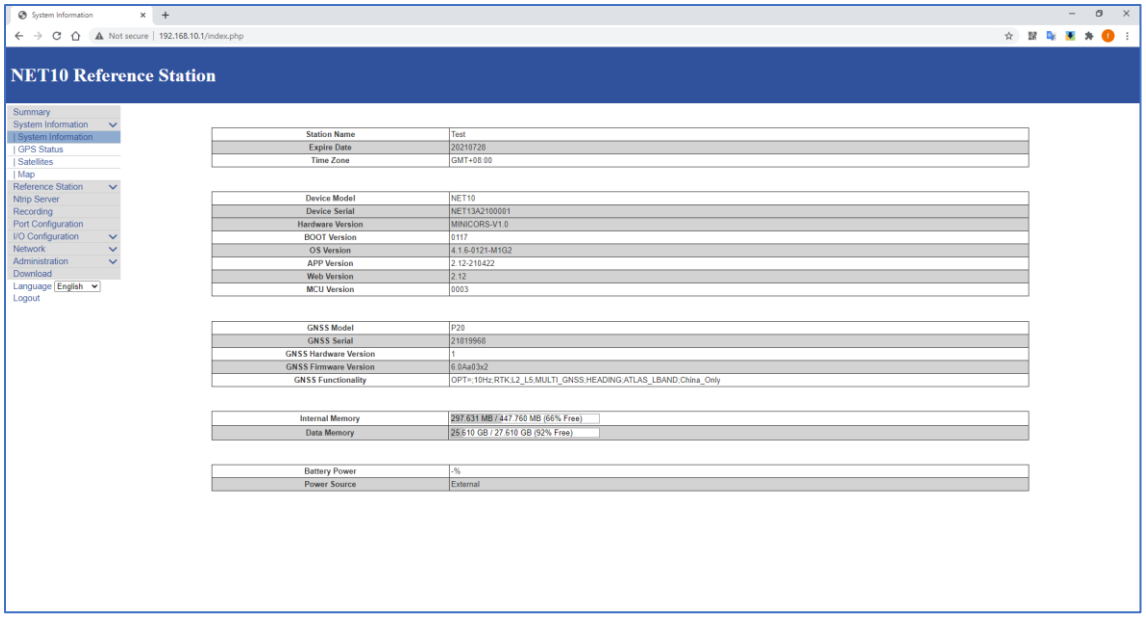
[Summary]

This page shows the basic information including device running time, device serial number, GNSS board, position, storage, and power supply status.



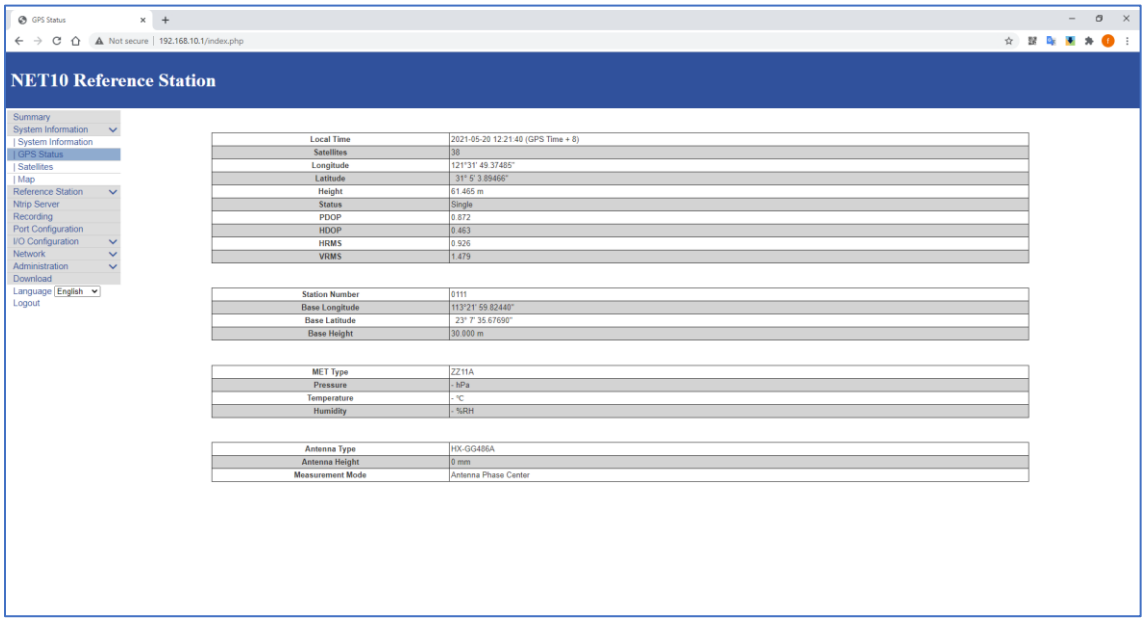
[System Information]

This page shows more details about the firmware version, GNSS functionality.



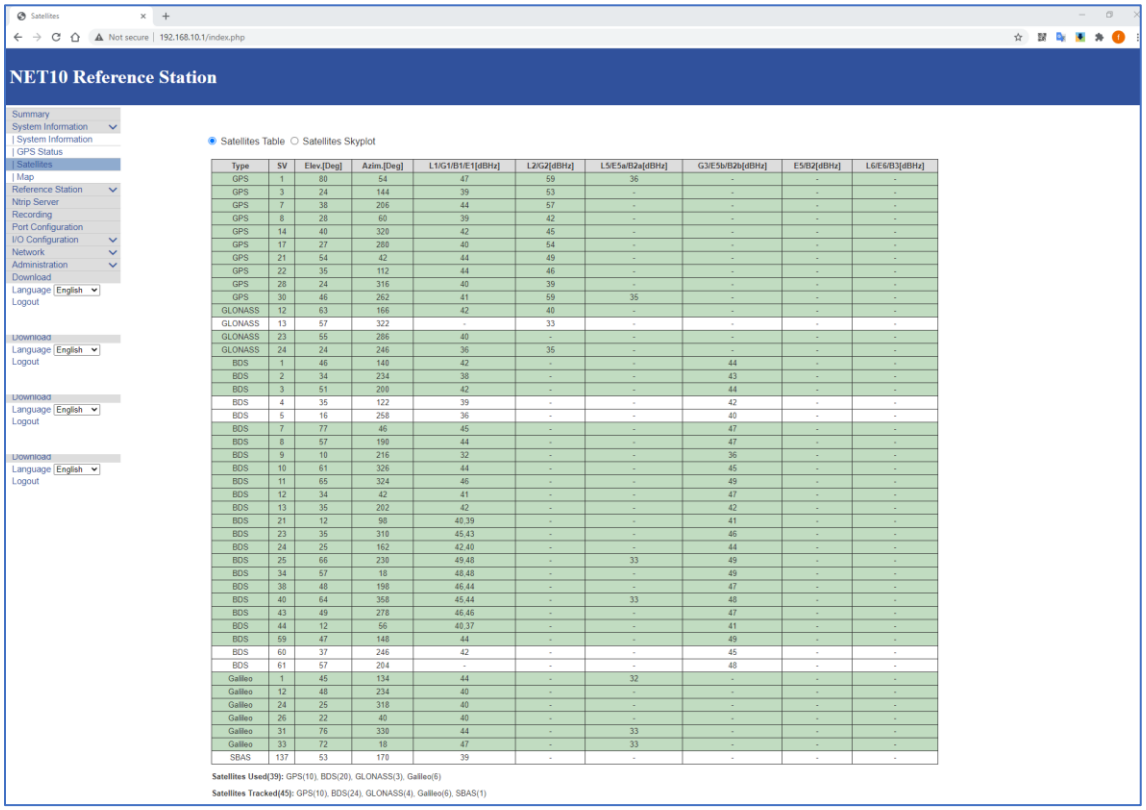
[GPS Status]

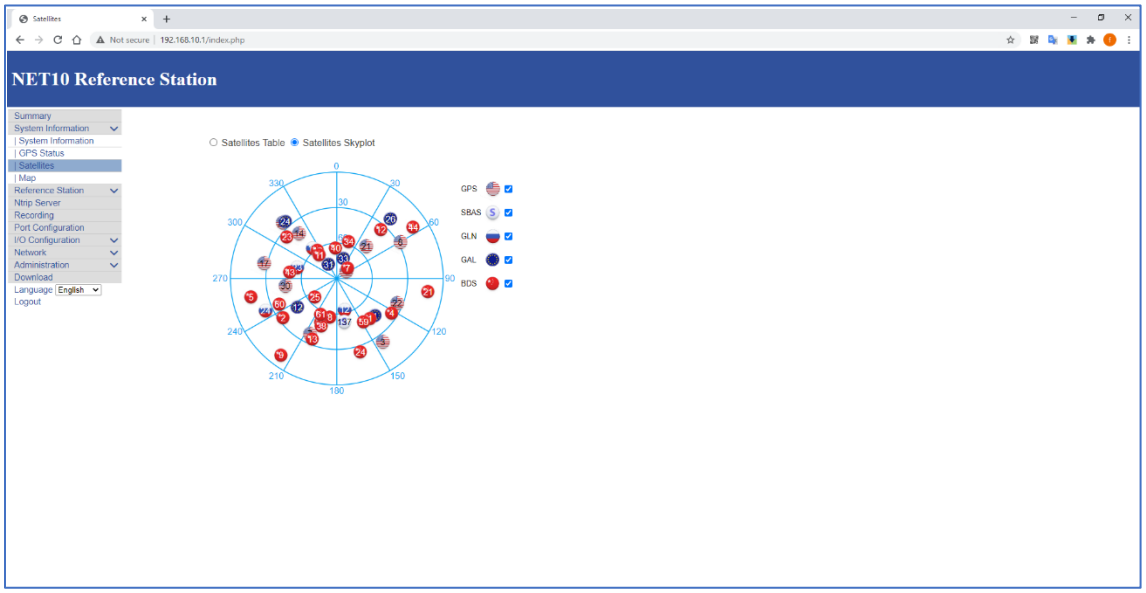
This page shows details about the position status including PDOP, HDOP, HRMS and VRMS.



[Satellites]

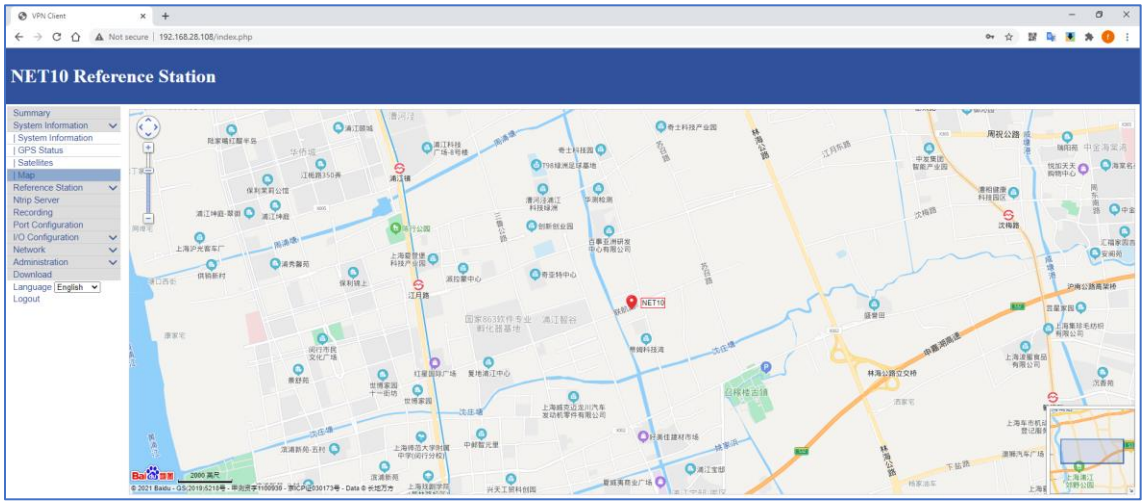
Satellites view in list or plot.





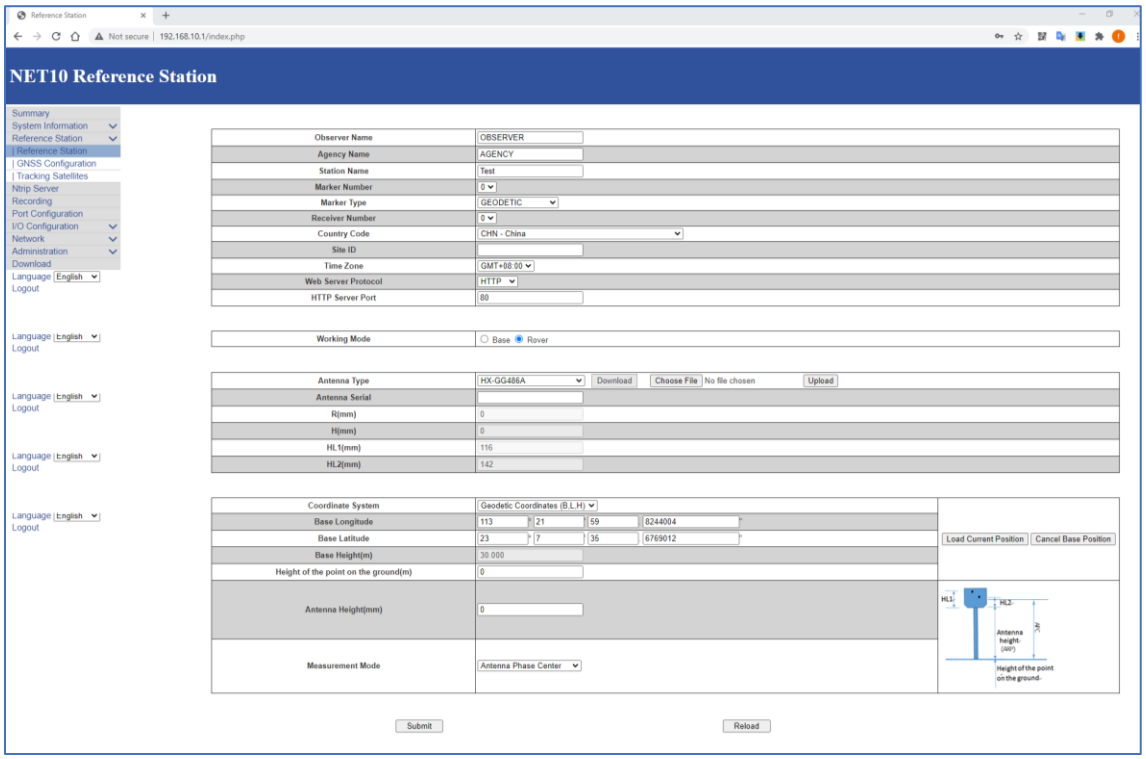
[Map]

The online map requires the computer or tablet to connect network.

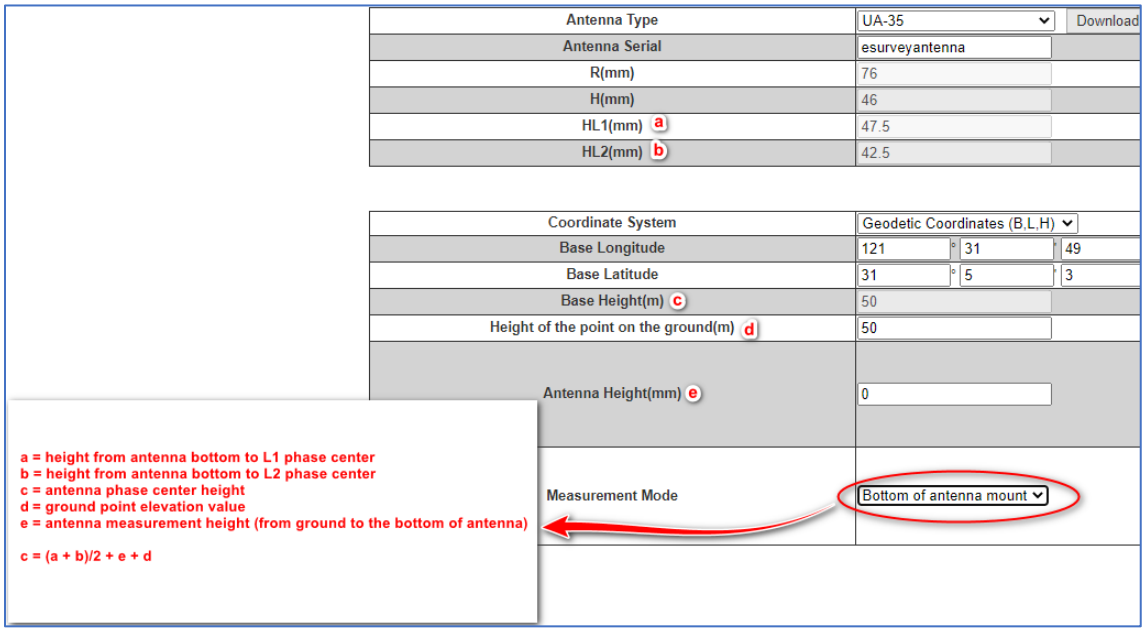


[Reference Station]

"Working Mode": to select base/rover mode. "Antenna": configurate the antenna parameters. "Coordinate and antenna height measurement": when setup base station, the base coordinate and antenna measurement height is required.

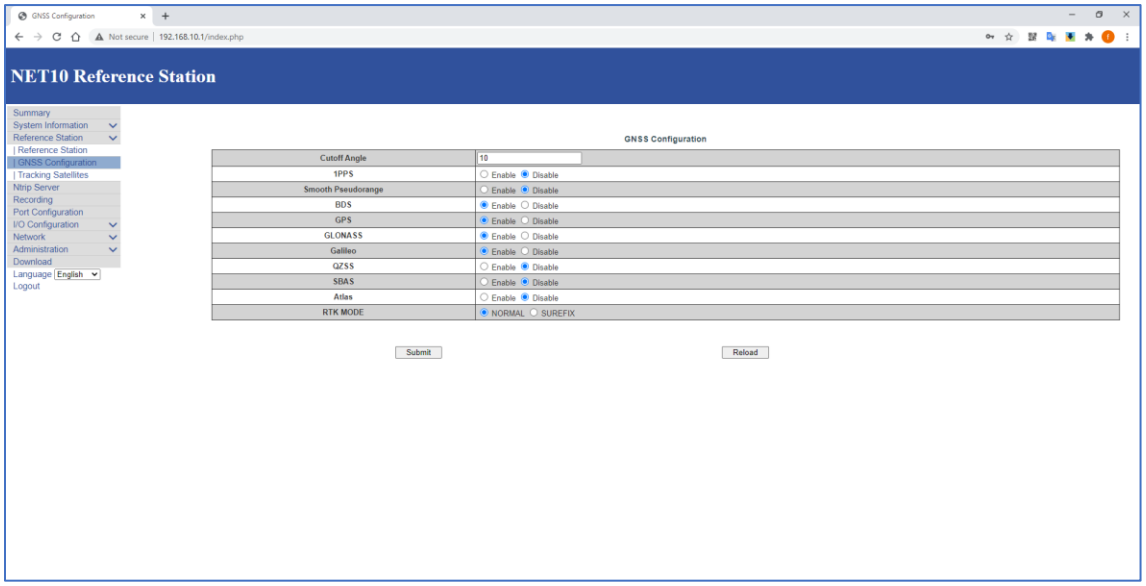


Below image shows how NET10 calculate the antenna phase center height when measuring from the bottom of antenna mount.



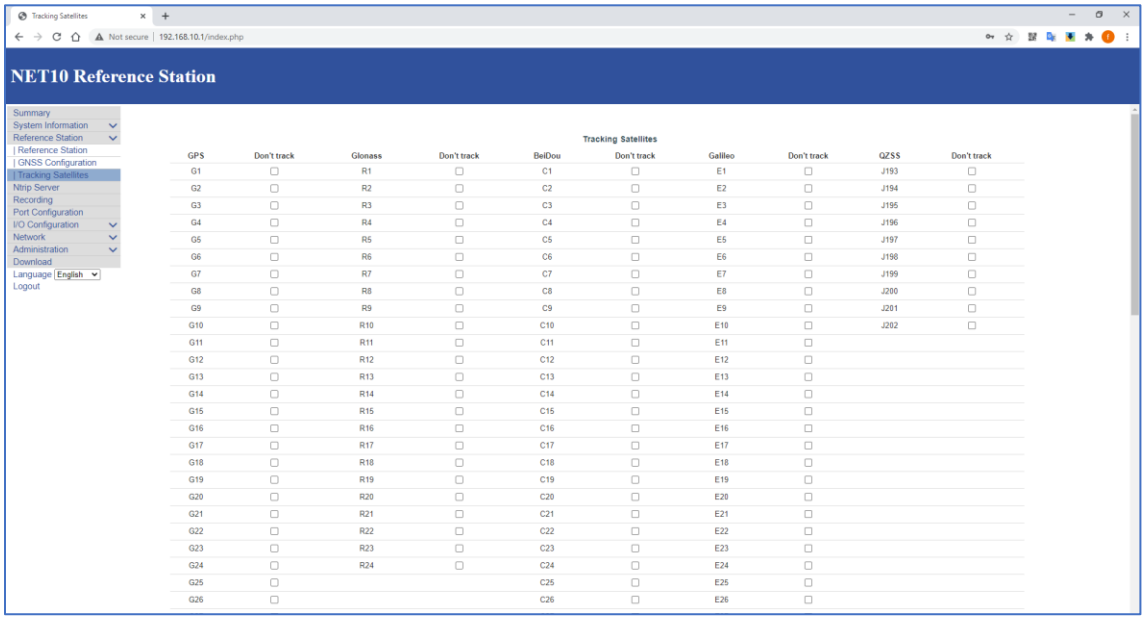
[GNSS Configuration]

To configurate cut-off angle and constellations.



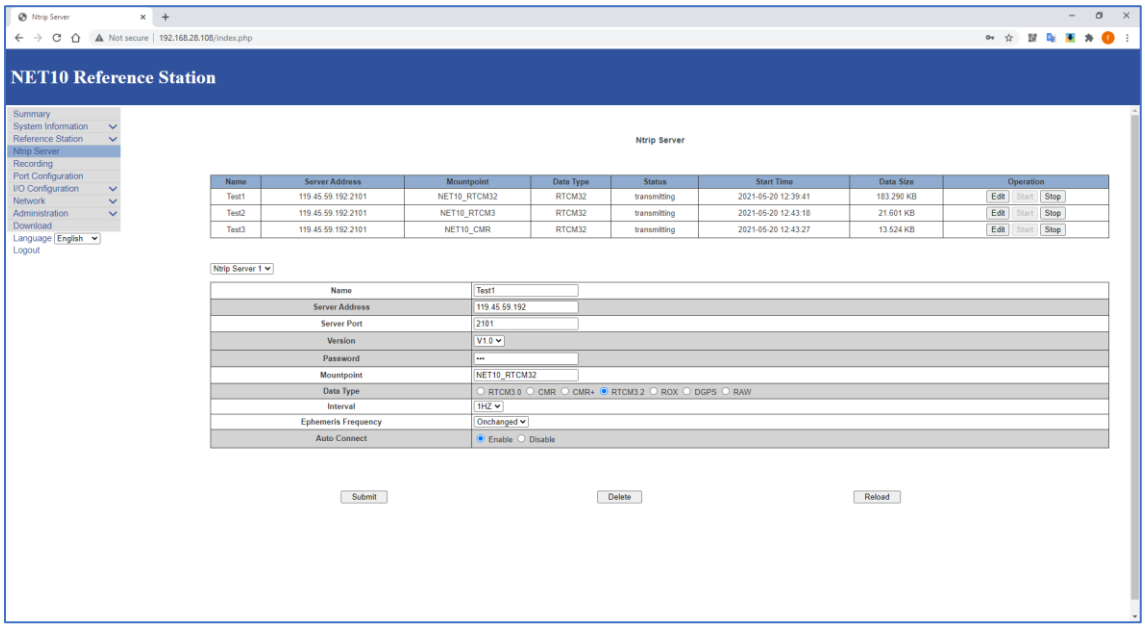
[Tracking Satellites]

To enable or disable satellite tracking.



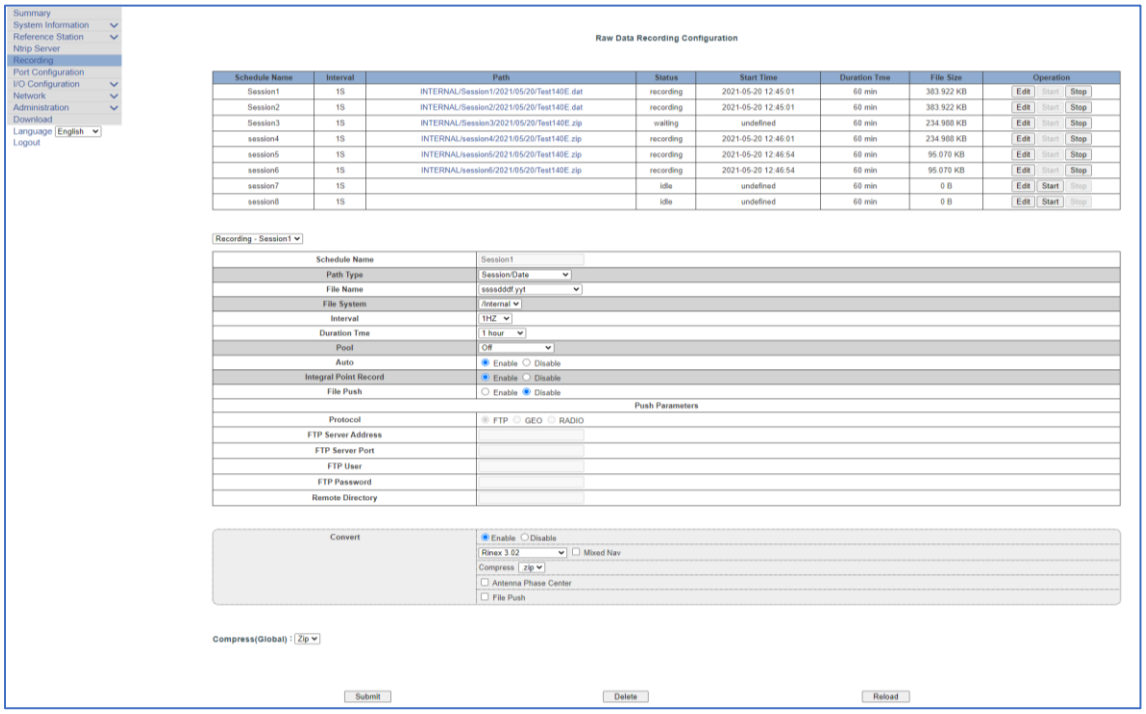
[NTRIP Server]

In base mode, NET10 can transmit correction streams to NTRIP Caster. Up to 3 data streams are supported simultaneously. When NET10 itself enables the “NTRIP Caster” function in “port configuration” page, here the “Server Address” is “127.0.0.1”.



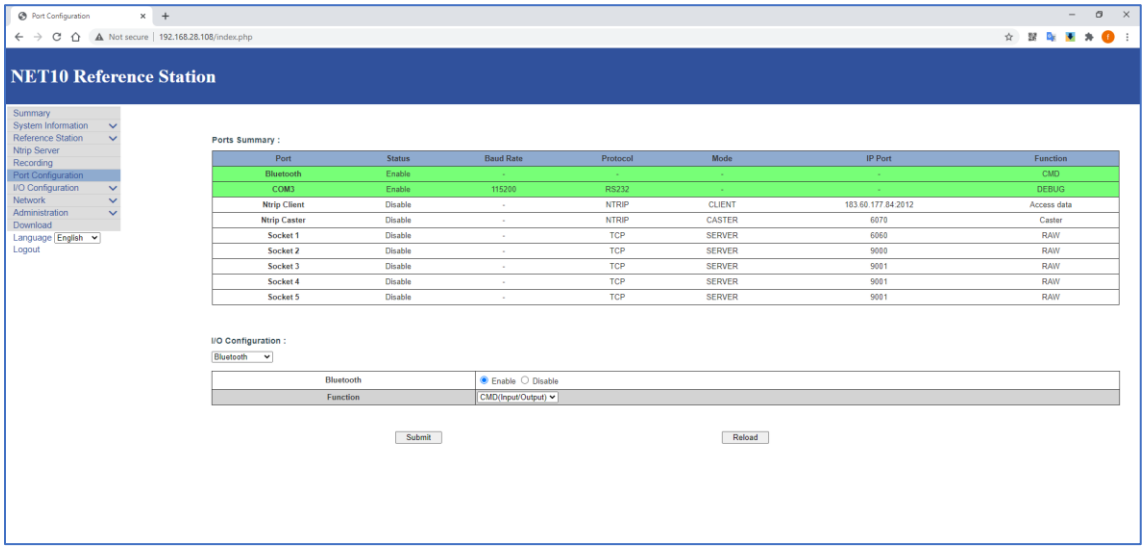
[Recording]

Configurate raw data recording and FTP upload. Up to 8 sessions are supported simultaneously. The original raw file format is *.dat, it supports to be converted to RINEX format. To save the memory, user can choose to compress the data in *.zip format.



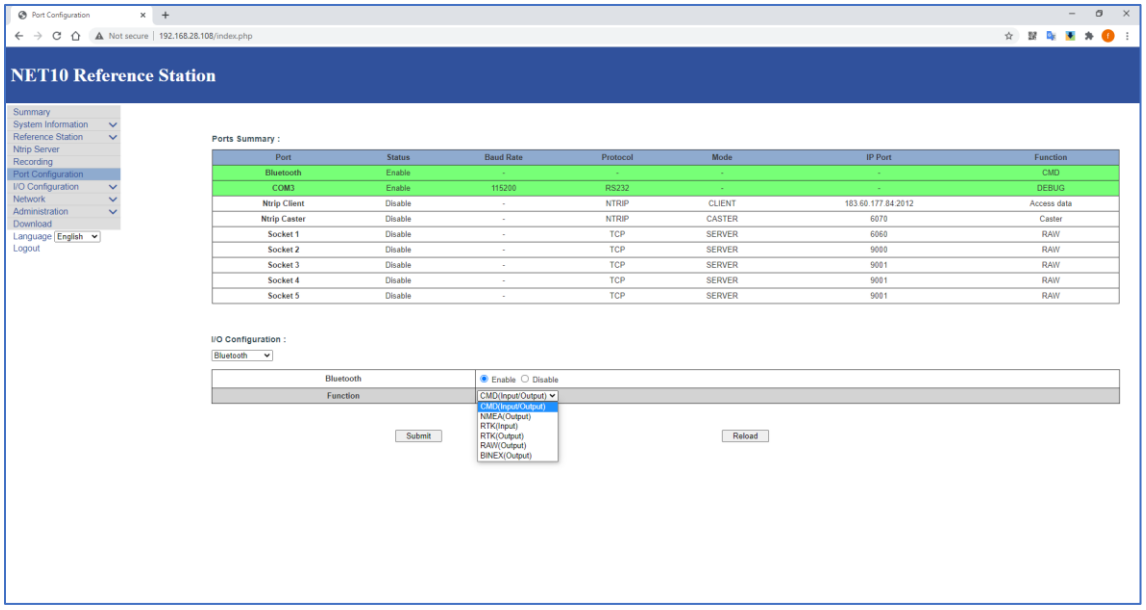
[Port Configuration]

NET10 supports Bluetooth, COM3 RS232, NTRIP Client, NTRIP Caster and 5 TCP/UDP sockets.

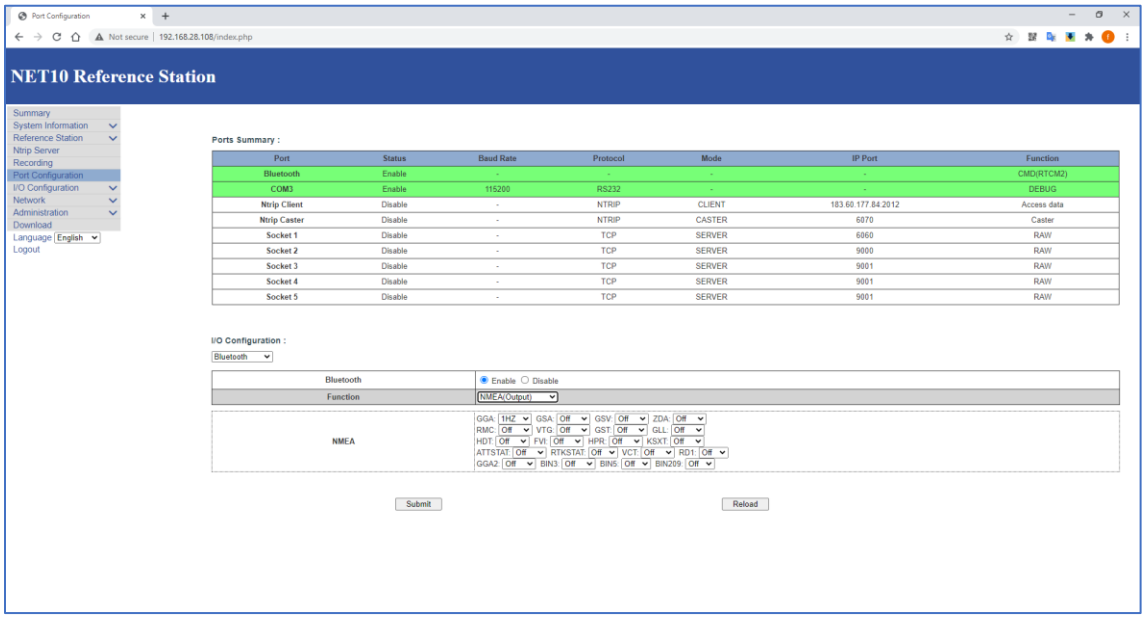


[Port Configuration-Bluetooth]

Bluetooth mode supports CMD(input/output), NMEA(output), RTK(correction data input/output), raw output and BINEX output.

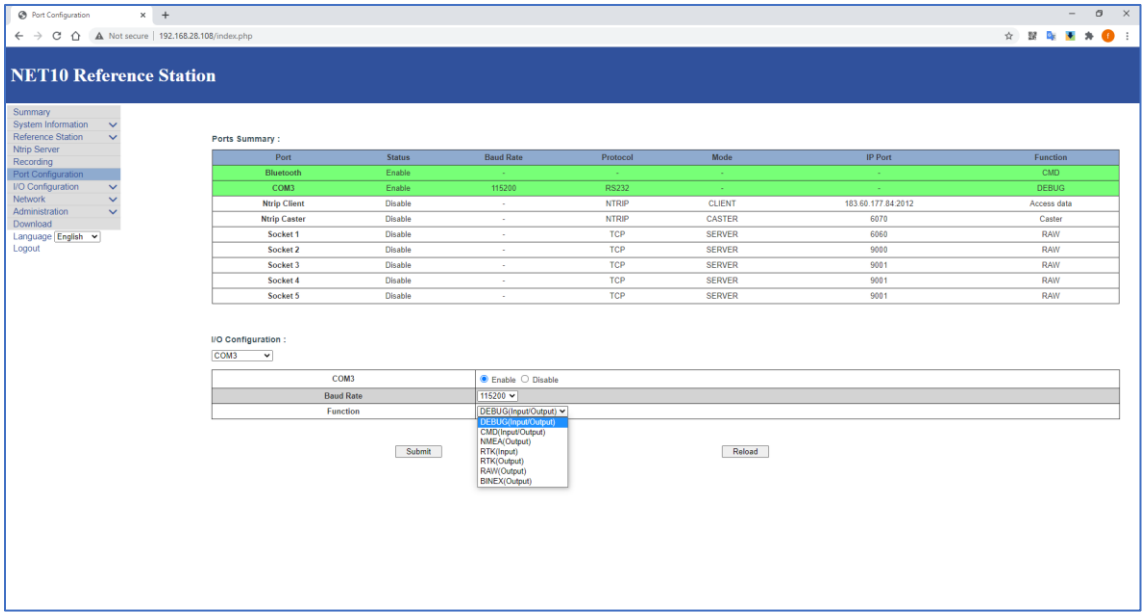


In NMEA setting, when “Convert Coordinate” is enabled, “FVI” message will output the local NEZH coordinate.



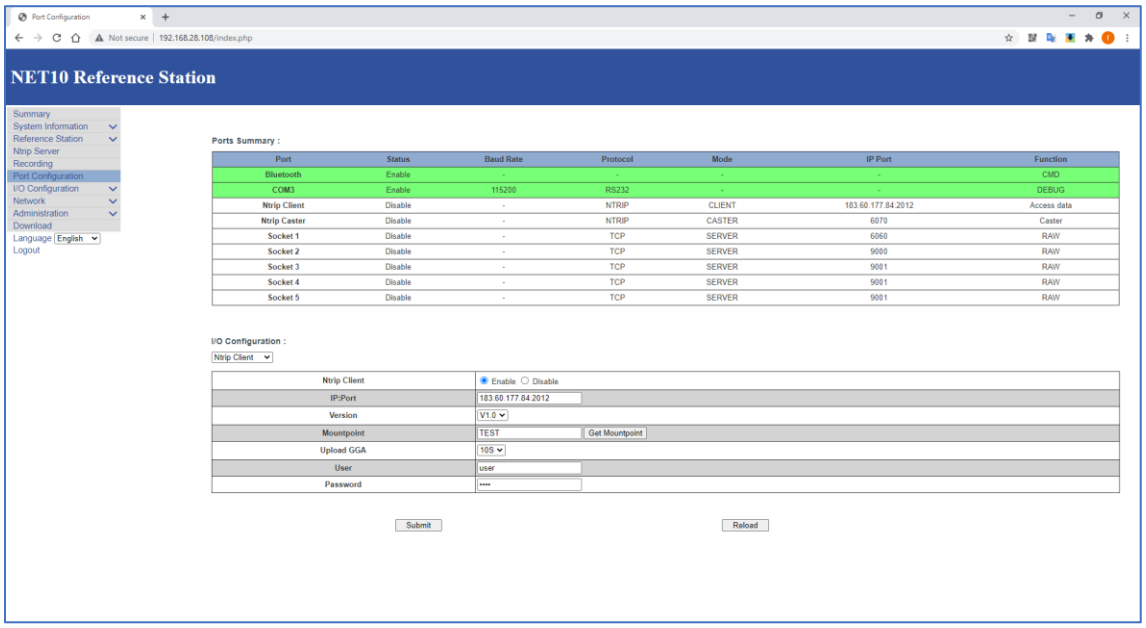
[Port Configuration-COM3]

COM3 supports Debug(input/output), CMD(input/output), NMEA(output), RTK(correction data input/output), raw output and BINEX output.



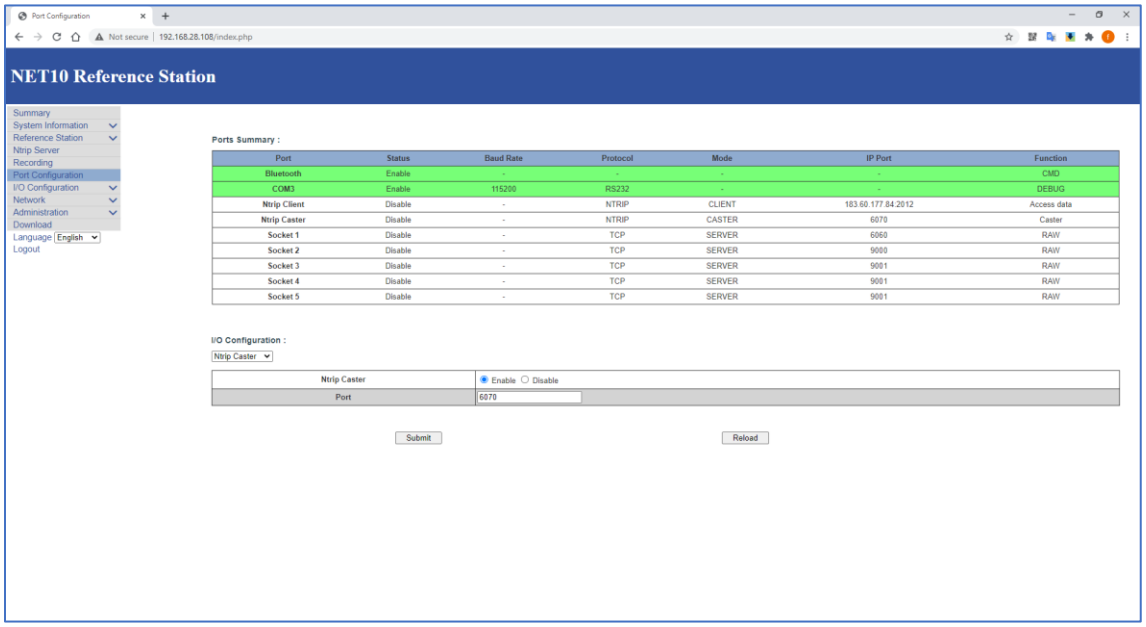
[NTRIP Client]

In “Reference station” page, when “rover” mode is selected. Setup NTRIP client parameter to receive the correction data.



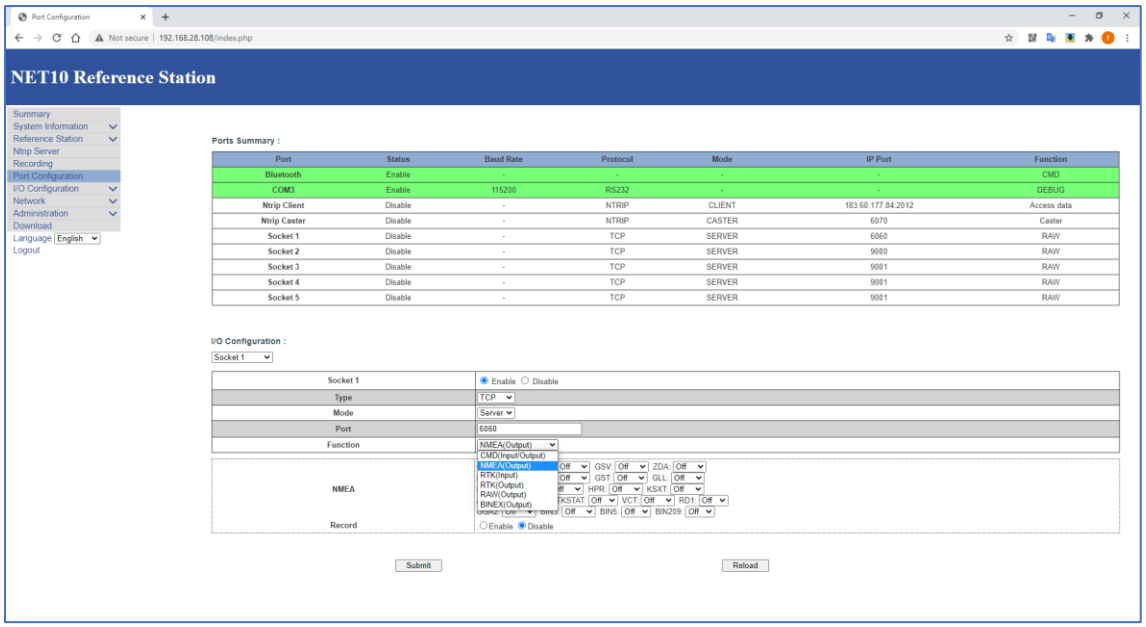
[NTRIP Caster]

NET10 has built-in NTRIP caster platform to forwarding the correction data. To let the user access the mountpoint, the ethernet network should have port forwarding rules for the port.



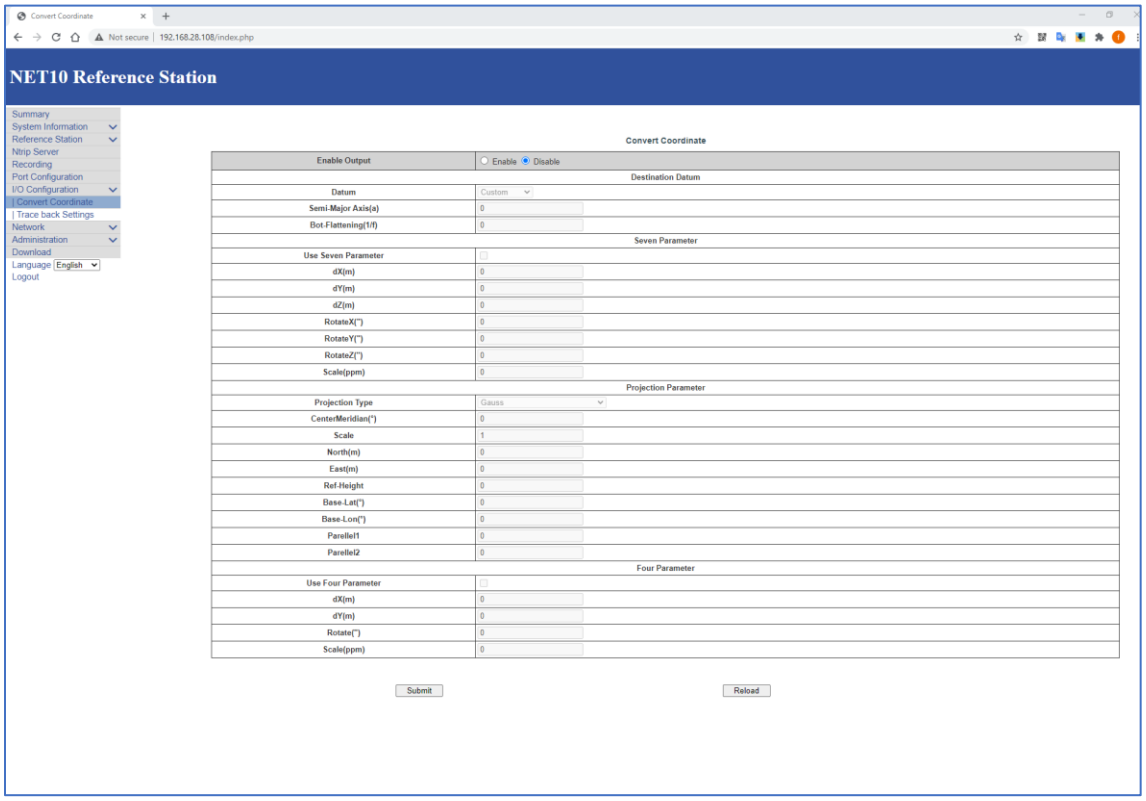
[Socket]

In socket setting, user can configurate TCP/UDP mode to transmit data.



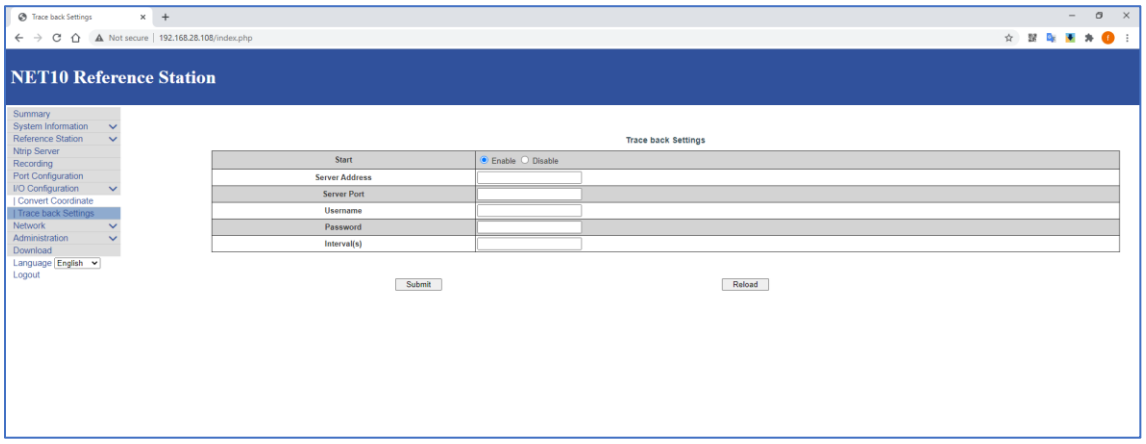
[Convert Coordinate]

NET10 supports local grid coordinate output. When “Convert coordinate” is enabled and the coordinate parameter is setup, NMEA message “FVI” in “Port Configuration” can output NEH values.



[Track back Settings]

The device can upload the position and device serial number information to TCP server.

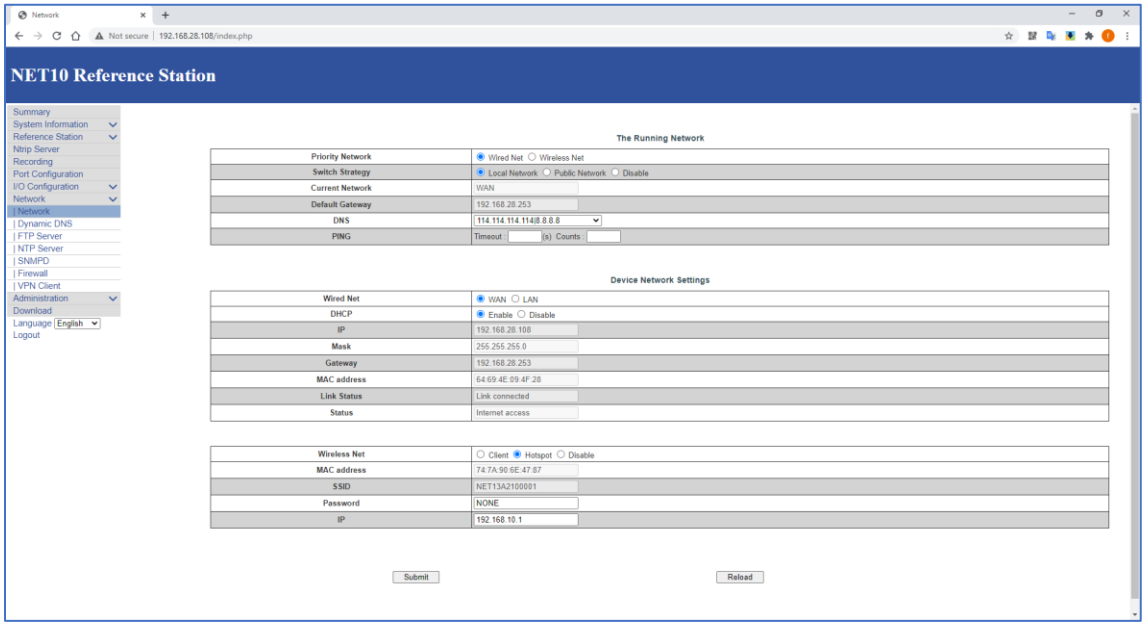


@GELOC,2021-05-20T17:02:51,31.0844208400,121.5303884860,58.6100,nan,-nan,58.6100,37,1,0.972,2.450,4.568,0,0.0730,53.7220,NET13A2100001,,,*4F

String	Type	Meaning	Note
@GELOC	string	Header	
Time	Number	Date and time	Second precision
Lat	number	Latitude	Unit: degree
Lon	number	Longitude	Unit: degree
Alt	number	Altitude	Unit: meter
North	number	North	Unit: meter, available when coordinate system is enabled
East	number	East	Unit: meter, available when coordinate system is enabled
Height	number	Elevation	Unit: meter
SatNum	number	Used satellites	
PosStat	number	Solution status	0 = No position 1 = Single 2 = DGNSS 4 = Fixed 5 = Float
PDOP	number		
HRMS	number		
VRMS	number		
Age	number	Delay time	
Speed	number	Speed	Unit: km/h
Dir	number	Direction/Heading	Unit: degree
SN	string	Serial number	
,,,	-	Reserved	
Check	CheckSum	CRCB check	Check the message

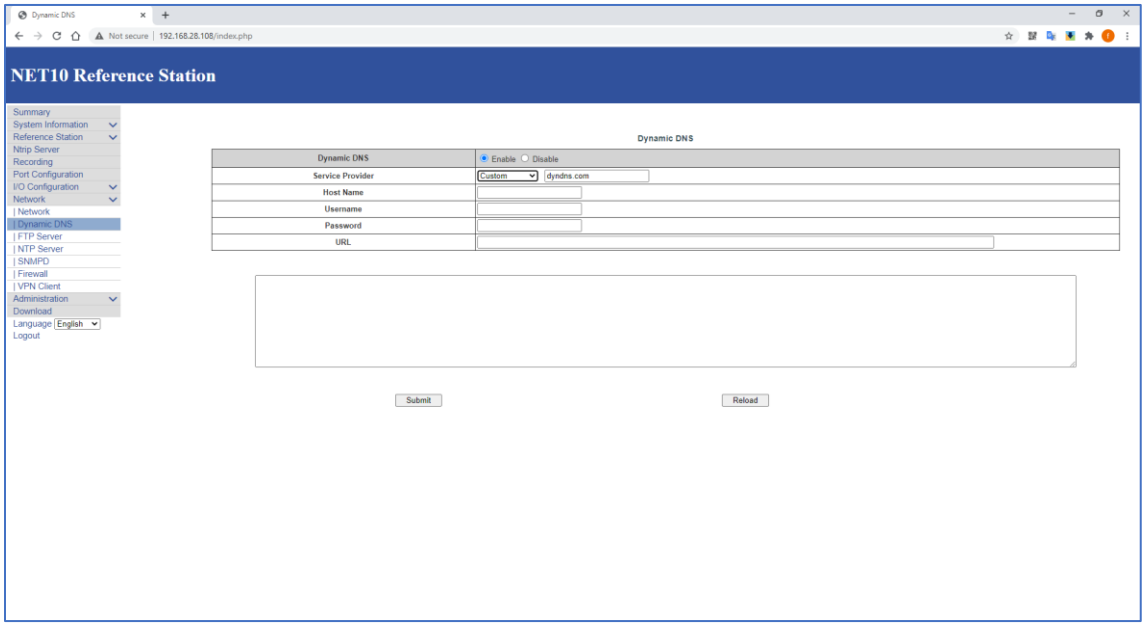
[Network]

To setup the ethernet or wireless network. Please note, once the wireless net is changed to “Client” mode, the WebUI will be stopped and not able to access. For user who is not familiar with the device, we do not suggest change the wireless net setting.



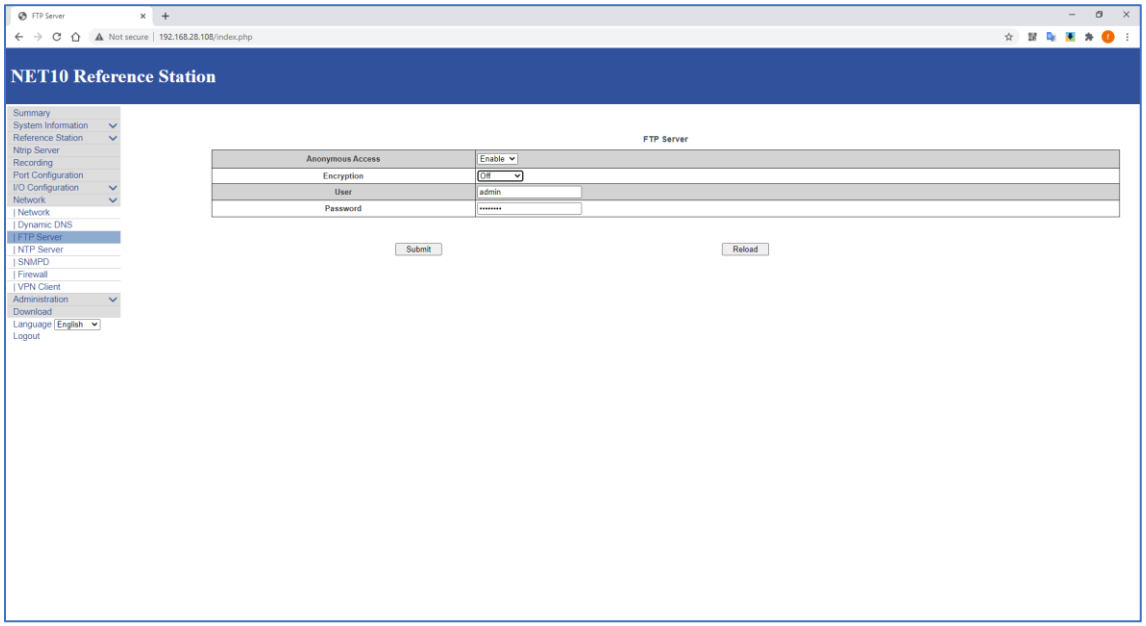
[Dynamic DNS]

This function can be used when NET10 itself as NTRIP Caster. If user does not have static IP, dynamic DNS service is suggested.



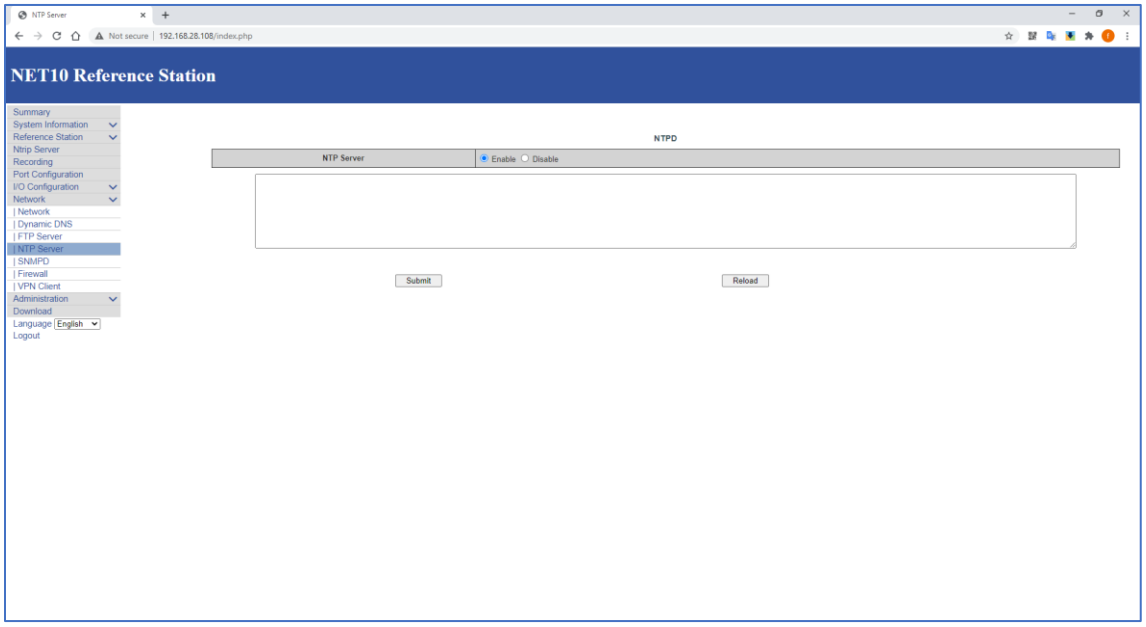
[FTP Server]

To configurate NET10 as FTP server. User can access NET10 storage with the correct username and password.

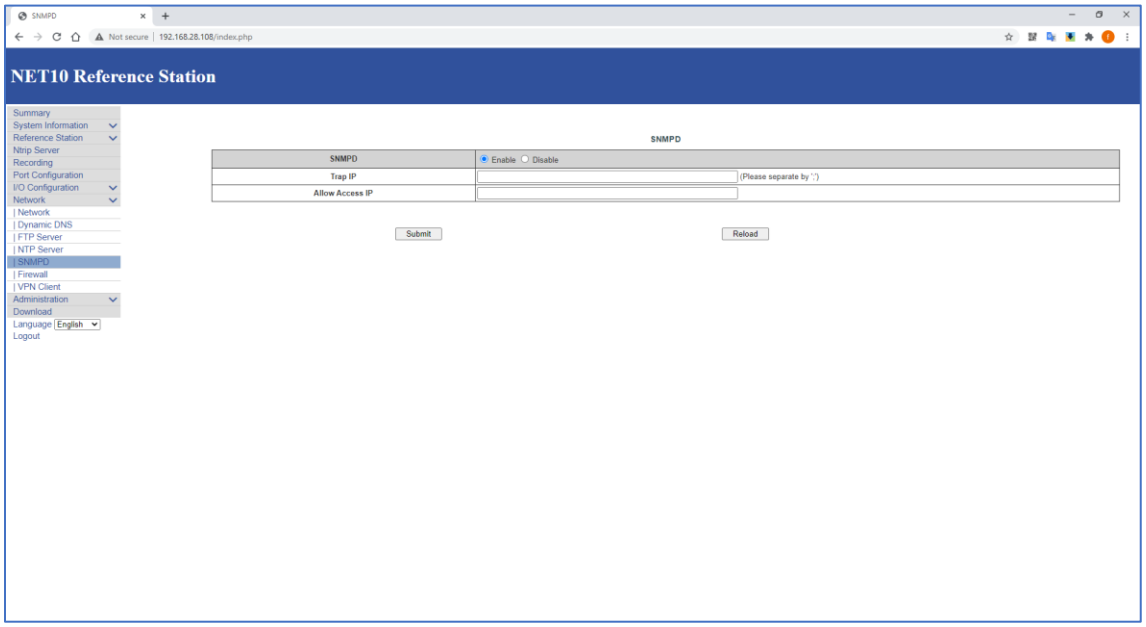


[NTP Server]

NET10 time is from the satellite. When enabled, the devices like computer which is under the same network can sync the time with NET10.

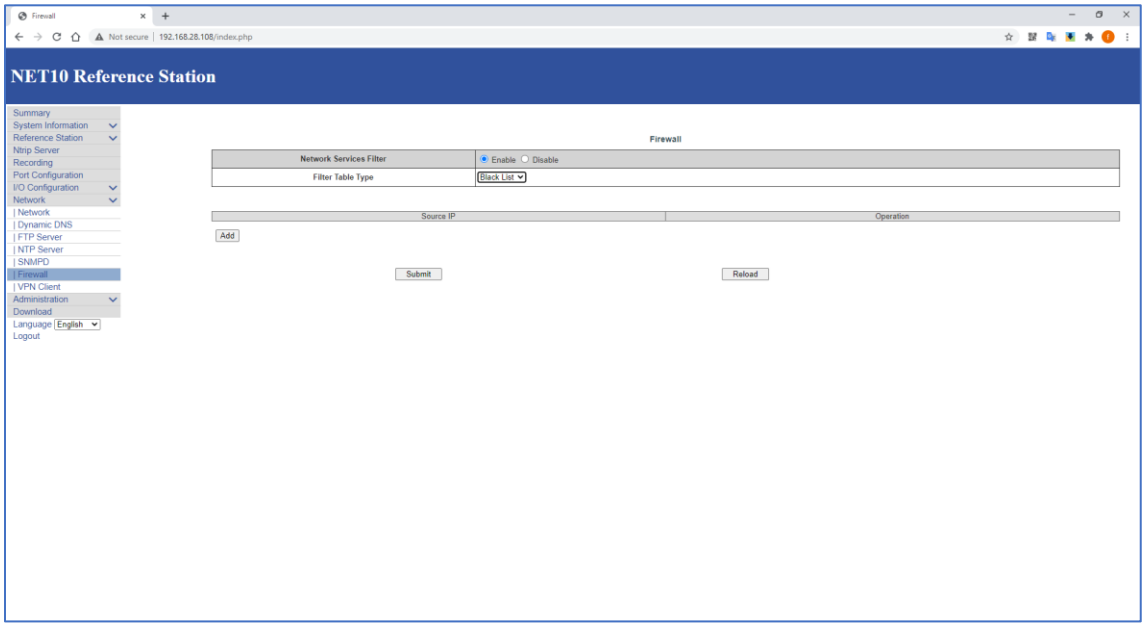


[SNMPD]



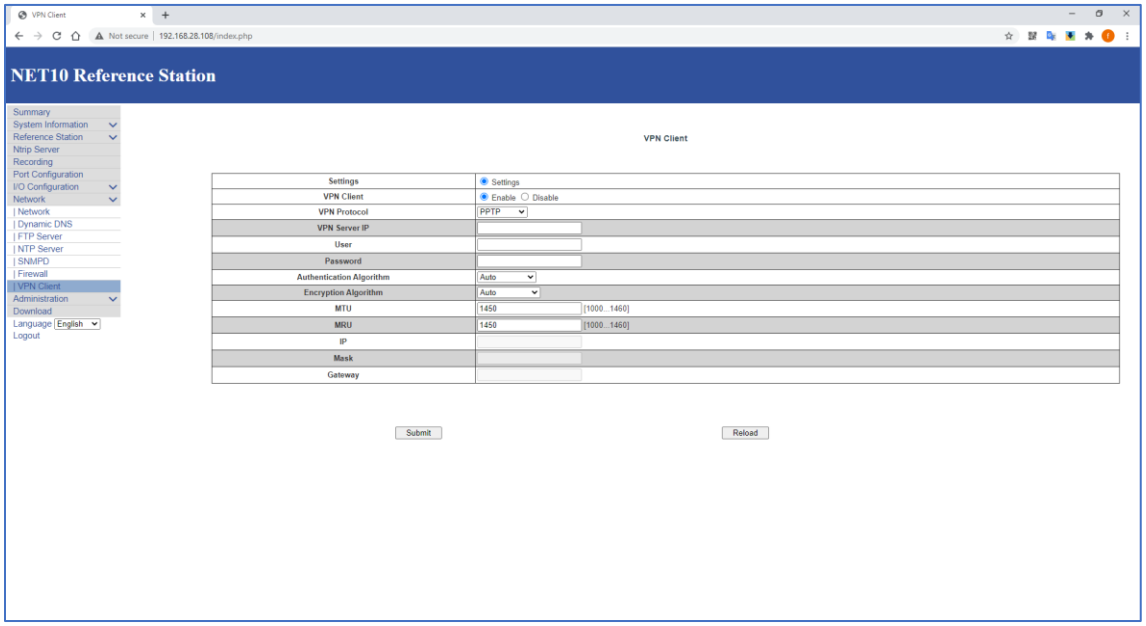
[Firewall]

To configurate the IP address access in blacklist or whitelist.



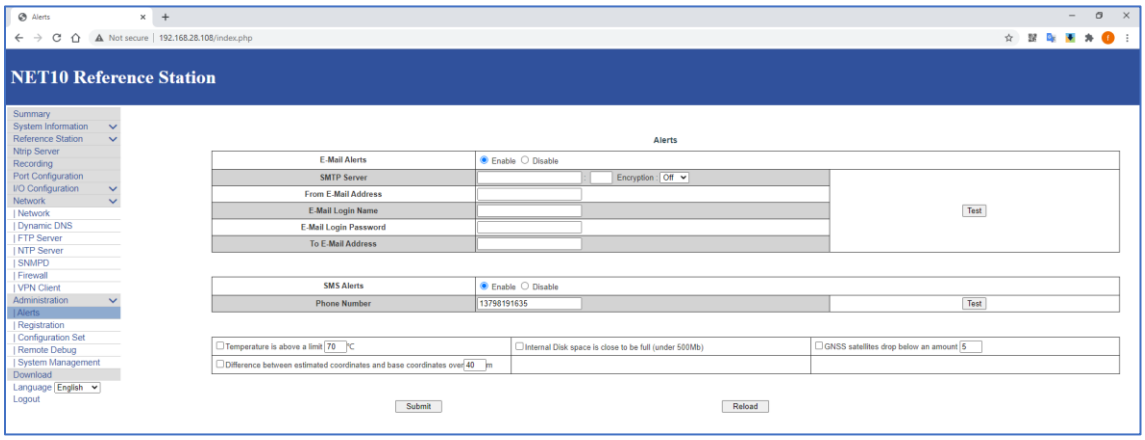
[VPN Client]

To configurate the VPN settings.



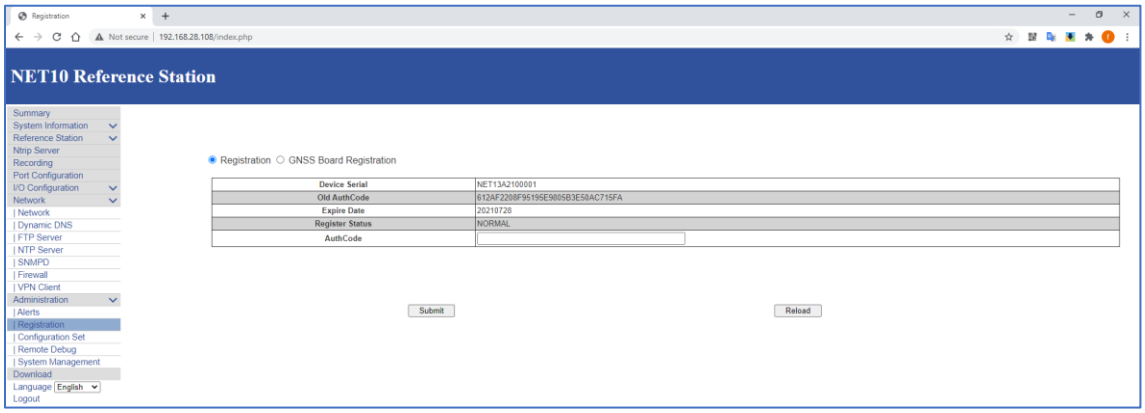
[Alerts]

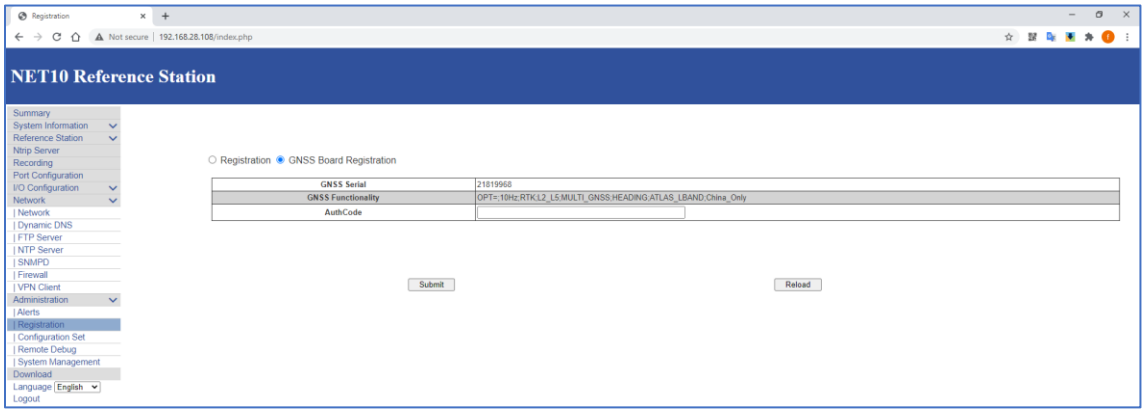
NET10 support email alert when temperature is above the limitation, internal storage is almost full, satellite number is to less or when the device is moved away.



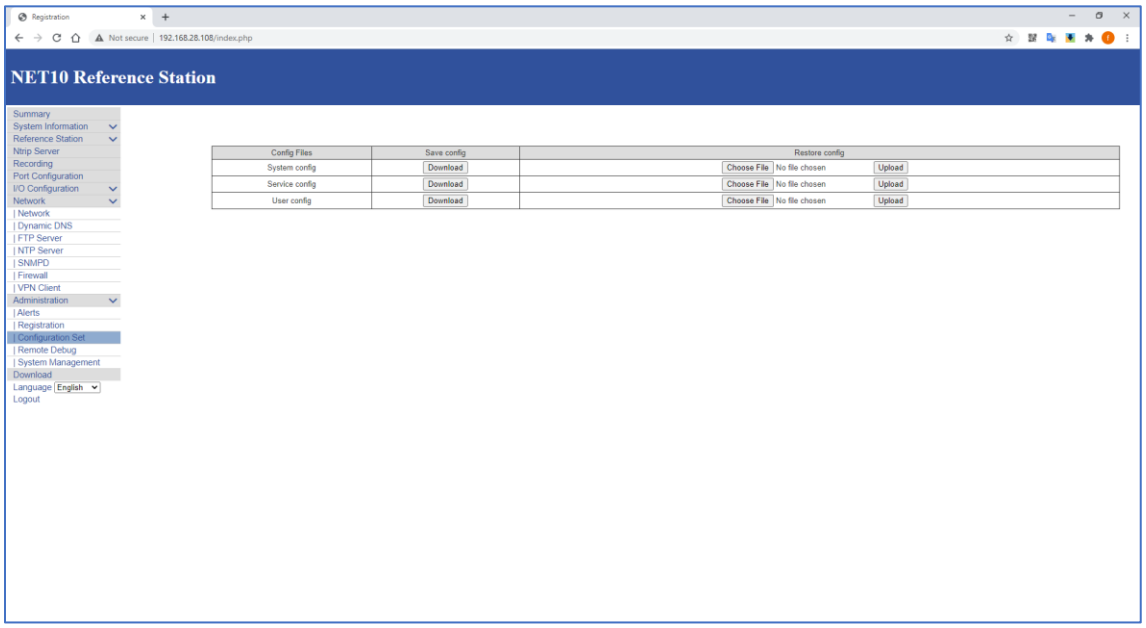
[Registration]

Register the device and GNSS board. For the GNSS board, it is used mainly to register the L-band Atlas function.

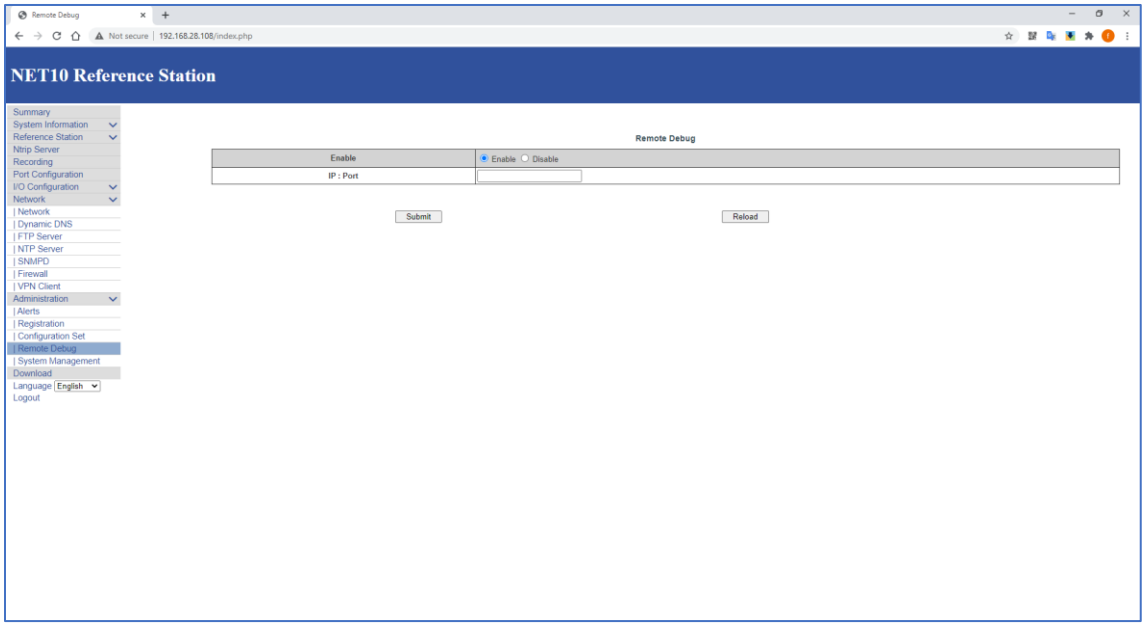




[Configuration Set]

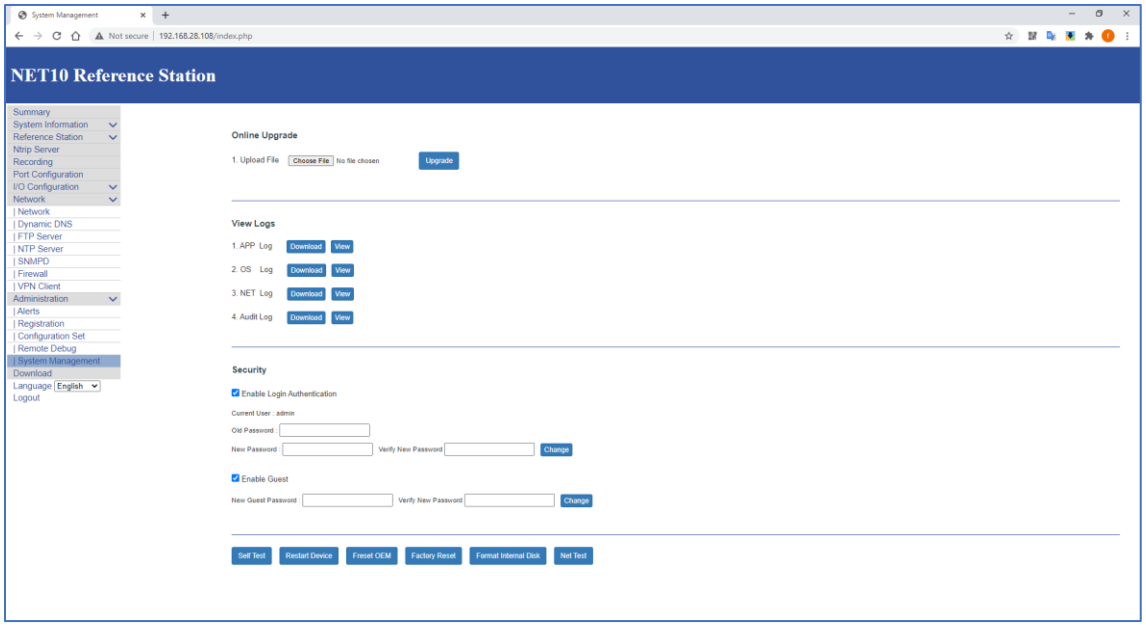


[Remote Debug]



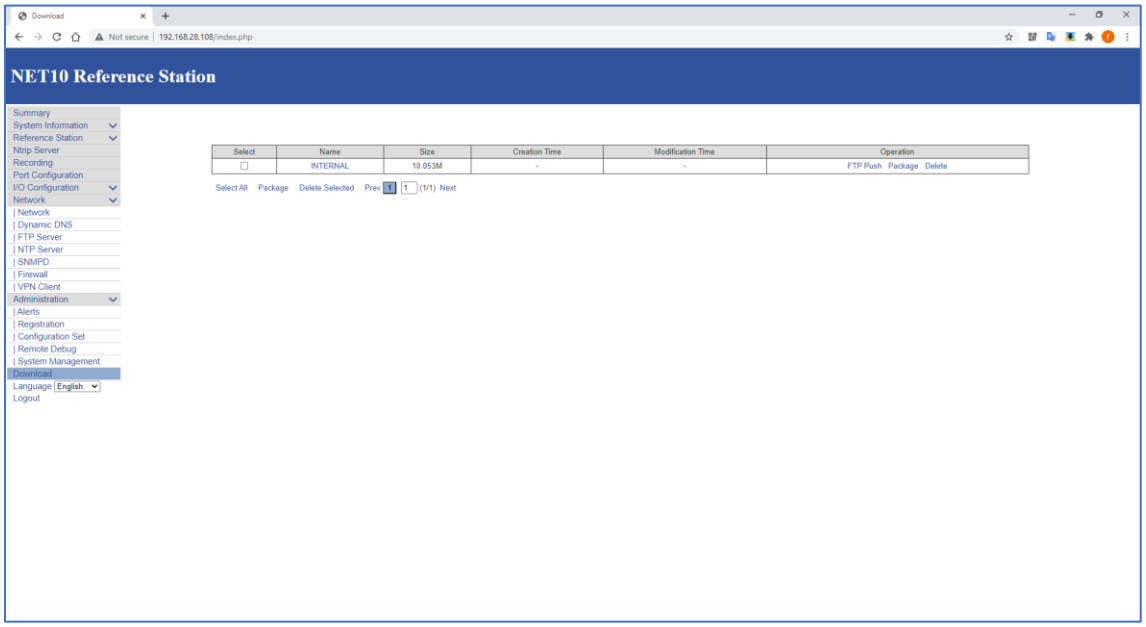
[System Management]

This page is used to update firmware version, view logs, change WiFi password, do self-test, restart device, reset GNSS board, reset factory settings, format internal disk.



[Download]

Download the recorded data.



Warranty Policy

The Guarantees Rights

- e-survey supports free exchange or refund within 7 days from the day when you have received the products, where the device appears "performance failure", which confirmed by e-survey repair center.

- e-survey supports free maintenance or exchange within 15 days from the day when you have received the products, where the device appears "performance failure", which confirmed by e-survey repair center.

- e-survey supports free maintenance or exchange the same type of device within one year from the day when you have received the products, where the device appears "performance failure", which is still not in working conditions after two repairs.

- e-survey supports a 24-month warranty service for the device host and a 3-month free warranty service for the accessory from the day when you have received the products.

Warranty service

If the device host meets the warranty conditions, the warranty service can be obtained according to the warranty card and the purchasing invoice. If the proof of purchase and the warranty card cannot be provided, and e-survey will use the delivery time as the standard for the warranty period.

- If it is a non-warranty product, and the repair center will handle the maintenance of the extra-fee.

- After the device is repaired, the same fault is con- firmed by the repair center and e-survey will provide a 3-month free warranty service.

- The transportation, delivery and disposal costs incurred during the delivery or inspection of the product to e-survey shall be borne by the user. The freight generated by the repair or inspection equipment returned to the user shall be borne by e-sur- vey.

- Equipment that needs to be repaired or sent for inspection, please back up the data in the machine in time.

- During the warranty period, the parts normally used for maintenance are free.

- The parts that have been replaced during the repair are owned by e-survey.

- e-survey is not responsible for non-product standard and software or applications that are not certified by the company.

Following conditions are not within the scope of the warranty and service

The device host and accessories have been subjected to: abnormal or improper use, improper storage of abnormal conditions, unauthorized disassembly or alteration, accidents, damage caused by improper installation.

- Damage caused by improper use of user, such as liquid injection, damage due to external force, etc.

- Failure to use, repair or transport caused by the equipment's instruction manual.

- Damage to the product is caused by external, including but not limited to, abnormal and unpredictable factors such as satellite systems, geomagnetism, static electricity, physical pressure, etc.

- Damage caused by force majeure such as earth- quakes, floods, wars, etc.

- Other conditions that cannot comply with the relevant provisions of the Guarantees Rights.

To be the leading provider of high-precision professional, solution & service in the global geospatial industry

Shanghai eSurvey GNSS Co., Ltd.

Address: Building 4, No.651 Wanfang Rd, Pujiang Town, Minhang District, Shanghai, China

E-mail: Sales: info@esurvey-gnss.com Support: support@esurvey-gnss.com

Hotline: +86 400-999-8088

Website: https://esurvey-gnss.com/