STONEX

STONEX SC600

GNSS RECEIVER

User Manual

Contents

1. Product Overview

SC600 is a high accuracy GNSS receiver for engineering, monitoring and other applications. The product is suitable for project applications such as vehicle monitoring, engineering inspection and automated data collection.

This chapter provides basic information to help you get familiar with your GNSS receiver.

Key Features

- Rugged housing
- 4G LTE, UHF and Bluetooth / WLAN datalink support
- Easy configuration from Web UI and remote server.
- Adapt to power supply requirements in various environments
- Intelligent connection
- IP67

At today SC600 is available in 2 version: Standard version and Full Version

Standard version includes GNSS, GSM, Radio and 5Hz, it is recommended for monitoring applications, reference stations RTK base stations. The Full version is thinked for other specific applications, it includes GNSS, GSM, Radio, 20Hz and Heading operation, it is recommended as RTK rover for ground vehicle, marine or aircraft based systems, providing GNSS multiconstellations heading and position data in static and dynamic environments.

1.1 Top view

Figure 1.1: Front view of SC600

Num.	Item	Led Color	Description
1	Power indicator	Red	On: Power supplied Off: Power off
2	Satellite indicator	Yellow	Always on: Float solution / fixed solution Flash each 1s: Single solution Off: Invalid solution
3	Bluetooth indicator	Blue	Always on: Bluetooth connected Flash: data transmission via Bluetooth Off: Bluetooth disconnected
4	WiFi indicator	Green	Always on: client mode opens Flash: data transmission in client mode Off: AP in normally open status
5	Network indicator	Green	Always on: network connected Flash: data transmission via network Off: network disconnected
6	Radio indicator	Green	Flash(at frequency of data transmission/receiption): data transmission/receiption Off: defaults to be off
7	Heading indicator	Green	Always on: heading output Off: no heading output

1.2 Front View

Num.	Item	Description
1	GNSS2	TNC, external GNSS slave antenna connector
2	PWR	2-pin LEMO connector, power supply
3	D-SUB 26	Two RS485 serial ports One RS232 serial port One USB2.0 interface (supports OTG) One 1PPS output interface One EVENT interface One CAN interface One 100M Ethernet port
4	GNSS1	TNC, external GNSS master antenna connector
5	LTE	SMA, 4G antenna interface
6	UHF	external UHF antenna

1.3 Right-side view

Num.	Item	Description
1	TF card slot	MicroSD card slot
2	SIM card slot	Nano-SIM card interface

1.4 Left-side view

1.5 Bottom view

2. Technical Specification

2.1 GNSS

- Channels：555
- Tracking signals

Satellite	Signals
GPS	L1 C/A, L2P
GLONASS	L1 C/A, L2P
BDS	B1, B2
Galileo	E1, E5b
QZSS	L1 C/A, L1C, L2C, L5
SBAS	L1, L5

- Update Rate: 5Hz Standard (20Hz Optional)
- Timing accuracy: 20ns
- Maximum Speed: 1,850 km/h
-

2.2 Physical

- Weight: 550g
- Dimensions: 150mm x 105mm x 34mm

2.3 Environmental

Operating temperature	-30℃~+65℃
Storage temperature	-40℃~+80℃
Dust and water protection	IP67
Drop	Designed to endure to a 1.5 m free drop on concrete floor with no damage
Vibration	Vibration resistant

2.4 Electrical

- Supply voltage 11-30V DC

2.5 Connector Ports

I/O Connectors	Power port, Lemo connector D-BUB 26 interfaces: -2 RS485 serial port -RS232 serial port -USB 2.0 interface -Ethernet port 100 Mbit -1PPS output interface -Event interface 2 GNSS antenna, TNC female Radio UHF antenna, SMA female LTE antenna, SMA female
Bluetooth	2.1 + EDR, V4.1
WIFI	802.11 b/g/n

2.6 Data Recording

- Storage

Device	Description
Internal Memory	8G
External	MicroSD card

- Data types Binary, RINEX, BINEX
- Data rates 2S, 5S, 10S, 15S, 30S, 60S 1Hz, 2Hz, 5Hz, (10Hz, 20Hz optional)

2.7 Data Streaming

- Number of streams 1 NTRIP server streams,1 NTRIP Client streams,5 Socket (TCP / UDP) streams
- Streaming ports WiFi, Wireless, UHF, Ethernet, COM1
- Navigation outputs GGA, GSA, GSV, GST, GLL, RMC, VTG, ZDA, HDT
- Reference outputs RTCM 2.3, 3.0, 3.2, CMR, CMR+, DGPS, BINEX, RAW

2.8 User Interface

- LEDs 7 LEDs, which show the power, satellite, Bluetooth, Wifi, network, radio and heading state respectively

2.9 System Configuration

- Operating system Linux
- Bluetooth Bluetooth 2.1+EDR, V4.0
- WIFI 802.11b,g,n Hotspot / client mode
- Ethernet 100M
- Network

System	Band
Band	LTE FDD: B1/B2/B3/B4/B5/B7/B8/B12/ B13/B18/B19/B20/B25/B26/B28 LTE TDD: B38/B39/B40/B41 UMTS: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8
Sim card	Nano Sim Card

2.10 Networking Services

NTRIP	Client/Server/Caster
Remote Management	Remote config by STONEX Cube-CORS
FTP server	For data download
Email alerts	For low storage and other warning messages

3. Operation

3.1 Power ON/OFF

SC600 will power on automatically after it connects the 2-pin power cable and have power supply.

And after it powered on, the indicators will show the device status. For example, the power indicator will light red. And if the WIFI is on, the WIFI will light green.

After the SC600 don't have power supply, it will power off.

3.2 Insert Cards

If you need to use the SIM card, you should insert the SIM card before you power on the SC600.

Please see the below picture, open the card cover first, then insert the SIM card and micro SD card as the notes in card cover.

3.3 Connect external accessories

In order to reach the work status, the SC600 should connect the external antenna, you can connect the external antenna to the GNSS1/2.

If you need to use the SIM card, you should insert the SIM card and connect the 4G antenna to the LTE connector.

If you need to use the radio, you should connect the UHF antenna to the UHF connector.

4. Web UI

SC600 has the WEB interface function, you can connect the SC600 WIFI to login the WEB interface to view the device information and set the device.

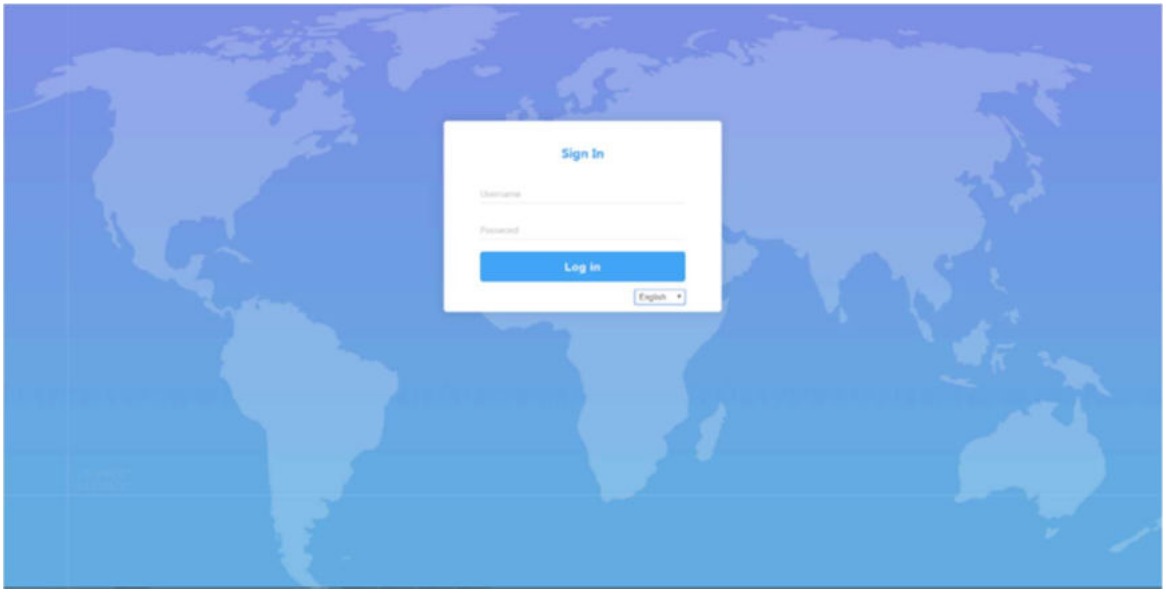
The WIFI hotspot name is the serial number of the receiver.

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.

- Username: admin
- Password: password

4.1 Summary

After authentication information to log into the web interface of SC600. Home page contents Station Name, Expire Date, Run Time, Device Model, Device Serial, GNSS Model, GNSS Serial, Radio model, Radio serial and receiver's positional information. It is shown as below:



SC600 Reference Station

- Summary
- System Information
- | System Information
- | GPS Status
- | Satellites
- | Data Transmission
- | Data Recording
- Configuration
- | Reference Station
- | GNSS Configuration
- | Tracking Satellites
- | Convert Coordinate
- | Network
- | Dynamic DNS
- | Ntrip Server
- | Recording
- | Port Configuration
- | Trace back Settings
- | Alerts
- | SNMPD
- | Firewall
- Download
- System Management
- Configuration Set

Language English

Logout

Station Name	Test
Expire Date	NONE
Run Time	0 day 1 hour 19 min

Device Model	SC600
Device Serial	SC60291900014
GNSS Model	OEM718D
GNSS Serial	BMNM19240300M
Radio Model	TRM121
Radio Serial	TRM12119090052

Longitude	113°25' 48.12447"
Latitude	23° 9' 59.67574"
Height	60.409 m
GNSS Status	Base
Local Time	1980-01-06 09:19:24

Internal Memory	34.188 MB / 223.866 MB (15% Free)
Data Memory	6.743 GB / 6.743 GB (99% Free)
External Memory	/ (0% Free)
TF Memory	/ (0% Free)

Battery Power	-%
Power Source	External

4.2 System Information

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

Station Name	Test
Expire Date	20190424
Time Zone	GMT+08:00
Device Model	SC2200
Device Serial	SC22A9023004E
IMEI	866758041223161
Hardware Version	NSC200II-V1.0-RS485
BOOT Version	1.10
OS Version	4.1.6-1.13(181031)
APP Version	2.12(190326)(foreign)
Web Version	2.12
GNSS Model	OEM729
GNSS Serial	BMGX18320631P
GNSS Hardware Version	OEM729-2.01
GNSS Firmware Version	OM7MR0500RN0000
GNSS Functionality	FFNRNN5BN (GPS+Glonass+Galileo+BeiDou,5Hz)
DHCP	On
MAC address	0C:AE:7D:D9:B5:D7
IP	192.168.3.129
Mask	-
Gateway	-
Internal Memory	42.129 MB / 223.866 MB (18% Free)
Data Memory	28.582 GB / 28.582 GB (99% Free)
Battery Power	75%
Power Source	BATTERY

4.2.1 GPS Status

Status page displays the current SC600 positioned state, the base station coordinates and antenna type usage.

Local Time	1980-01-06 11:04:12
Satellites	0
Longitude	0° 0' 0.00000"
Latitude	0° 0' 0.00000"
Height	0.000 m
Status	Idle
PDOP	9999.000
HDOP	9999.000
HRMS	0.000
VRMS	0.000

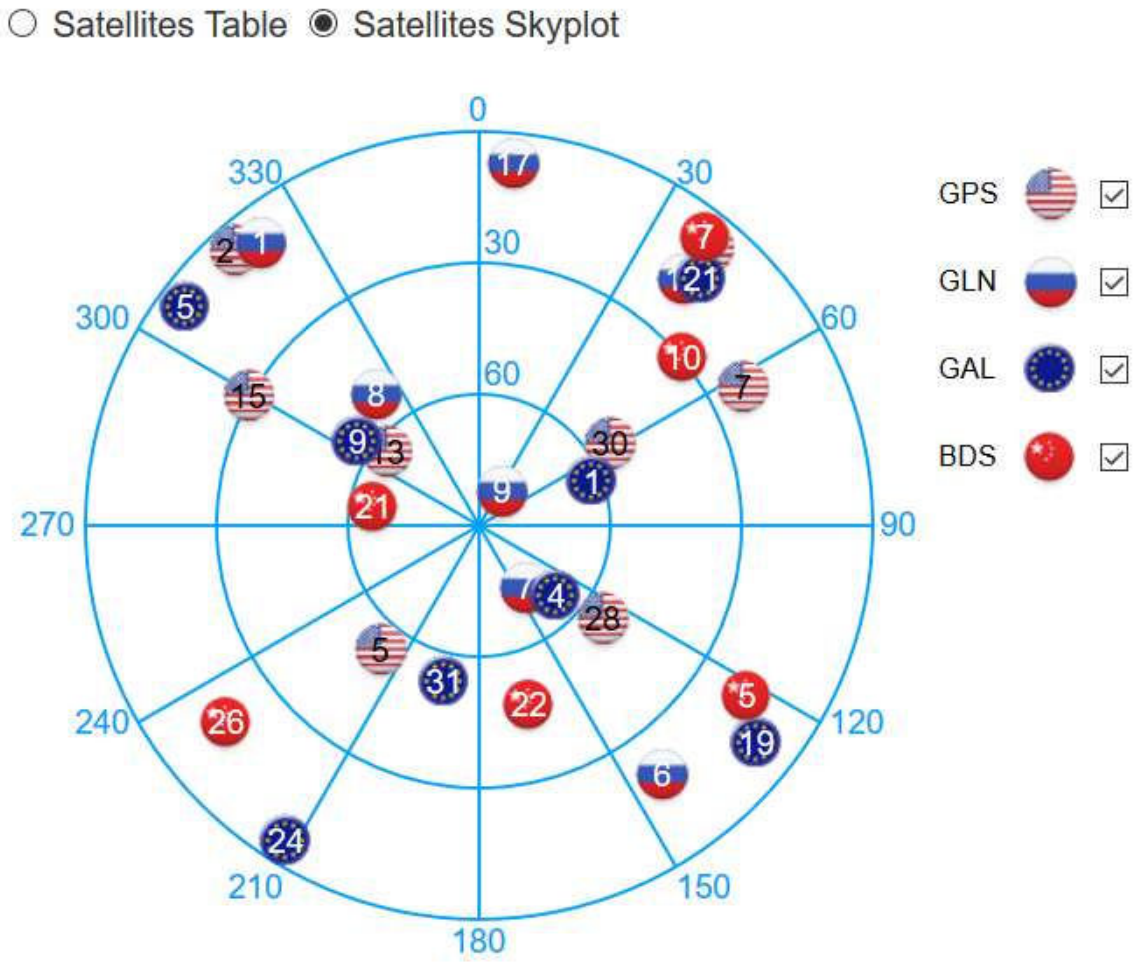
Station Number	0111
Base Longitude	113°21' 59.82440"
Base Latitude	23° 7' 35.67690"
Base Height	30.000 m

MET Type	ZZ11A
Pressure	- hPa
Temperature	- ℃
Humidity	- %RH

Antenna Type	HX-GG486A
Antenna Height	0 mm
Measurement Mode	

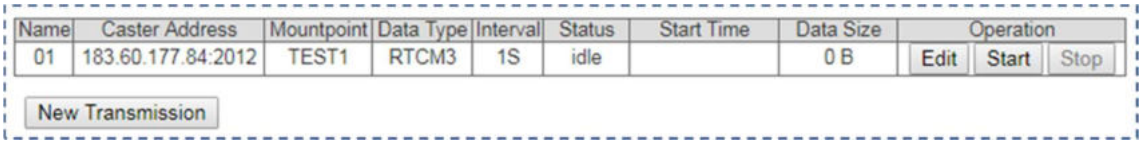
4.2.2 Satellites

In this page, you can view satellite Sky plot and satellite lists.

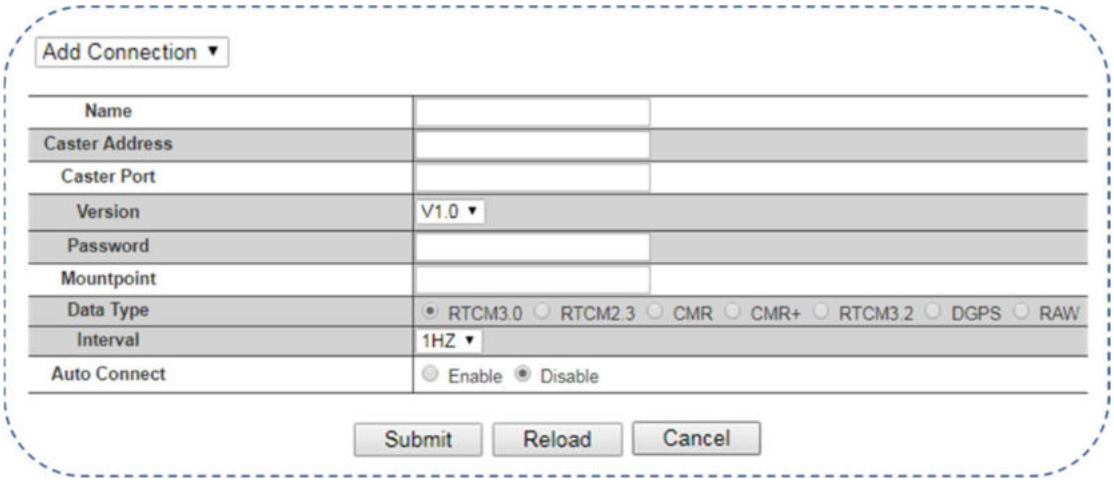


4.2.3 Data Transmission

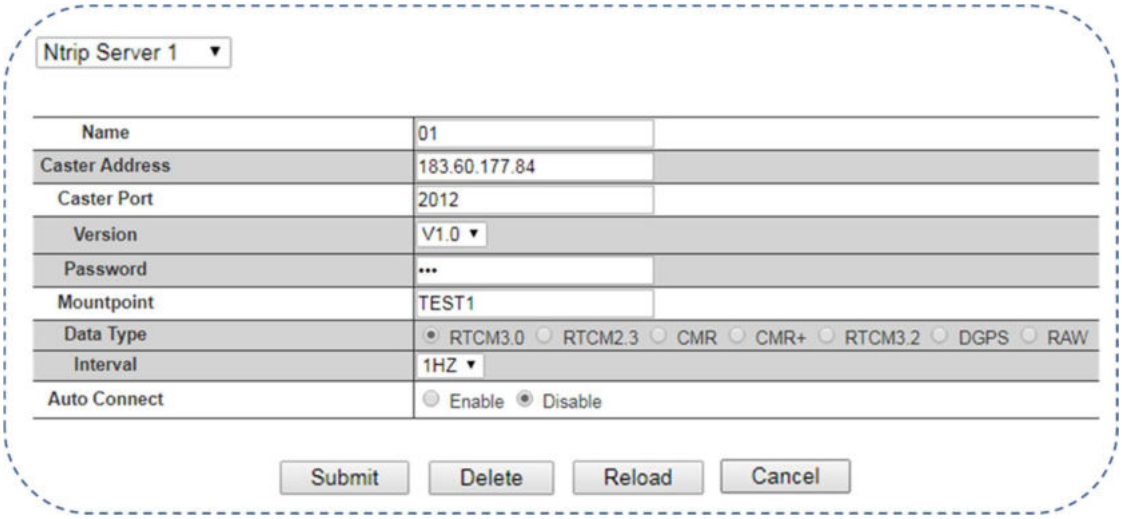
This page shows the current data transmission status, click [Edit] to set the transmission parameters



When you click 【New Transmission ,it will pop up to this new page【Add Connection】

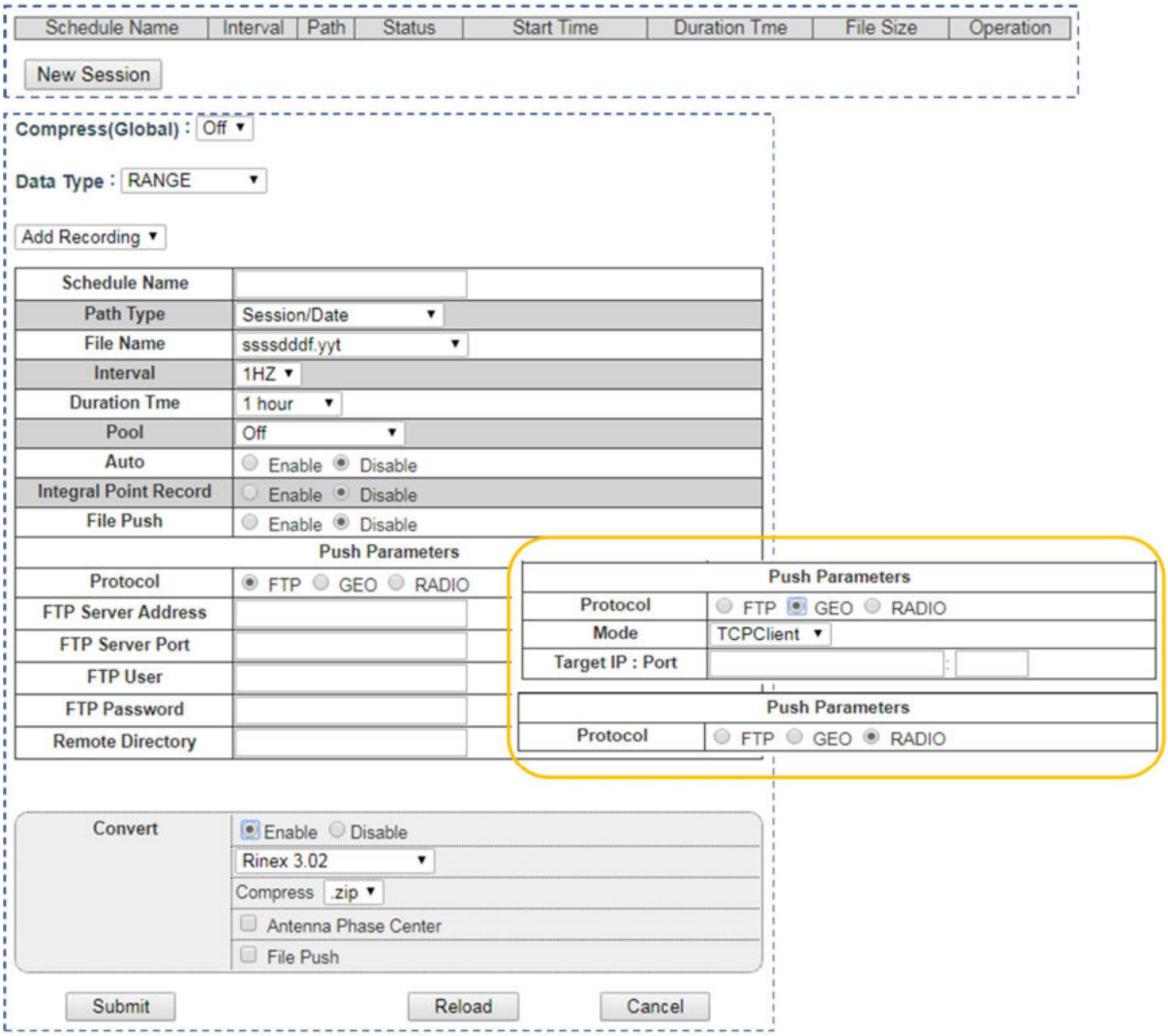


Also you can also choose this 【Ntrip Server 1】



4.2.4 Data Recording

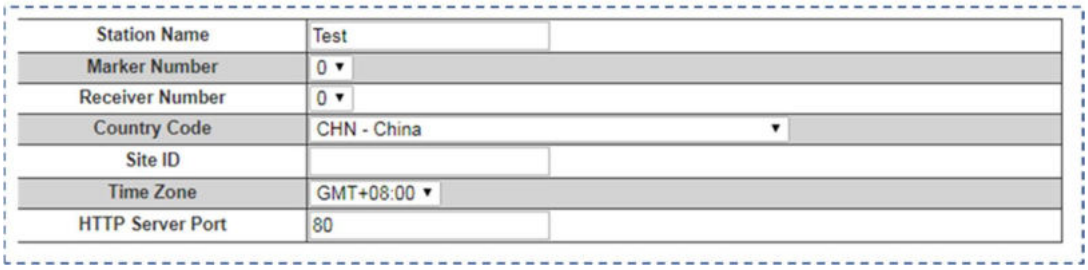
Data recording is used to store static data for data analysis, static solutions, and other post-processing. In this page the user could view the current data recording status, click [Edit] to set the recording parameters.



4.3 Configuration

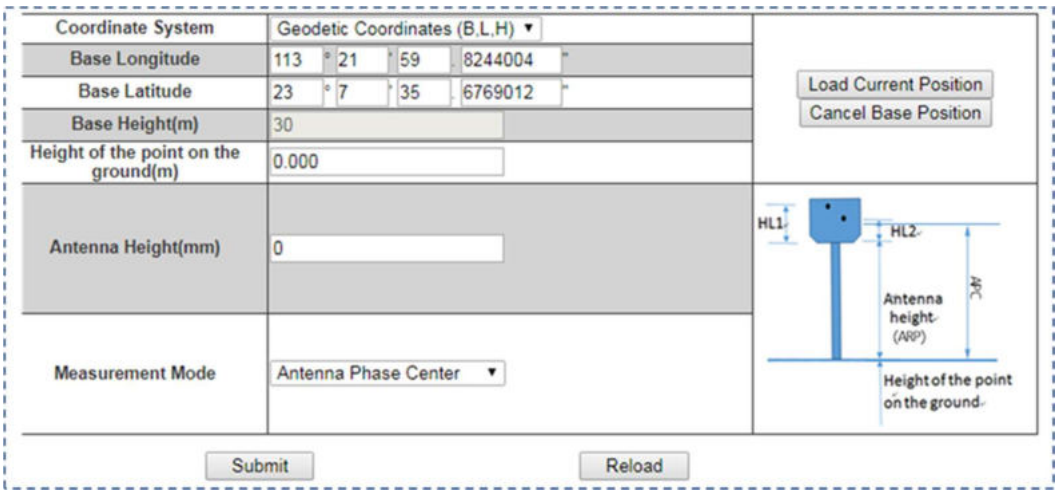
4.3.1 Reference Station

This page mainly sets the station name, Marker Number, Receiver Number, time zone and so on



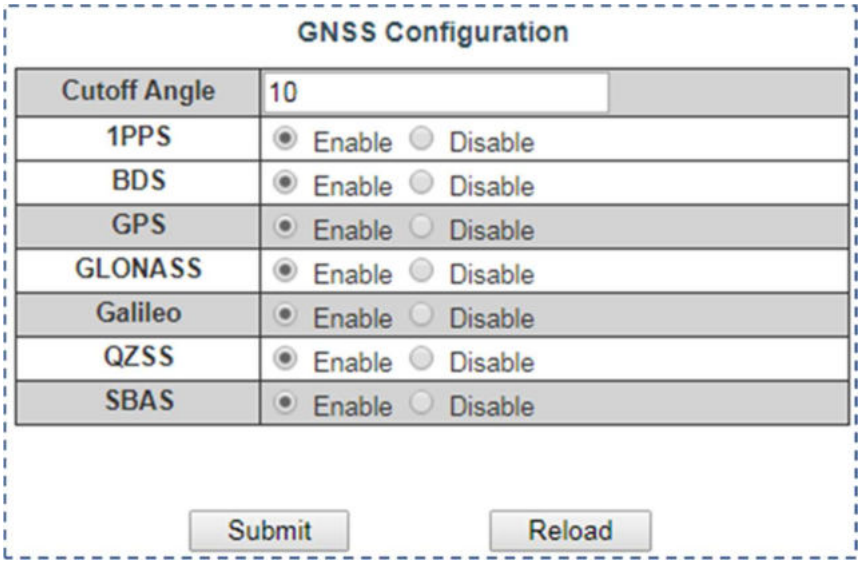
Antenna parameters：chose the corresponding antenna type, and then input the actual antenna height of the station.

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.



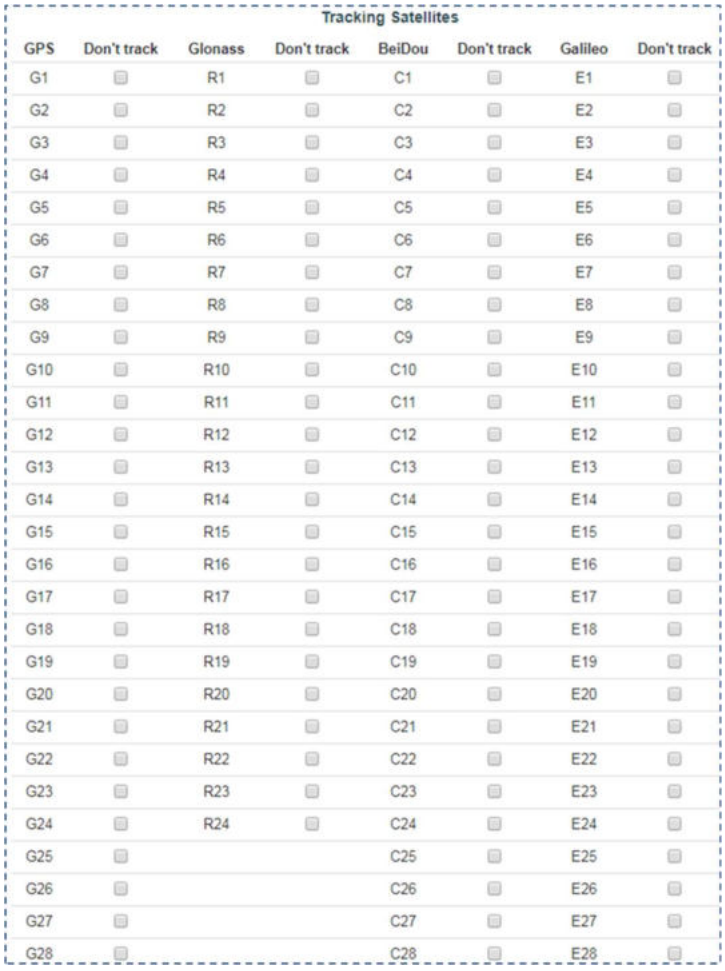
4.3.2 GNSS Configuration

In this page, you can set information of satellite systems and the cutoff angle.



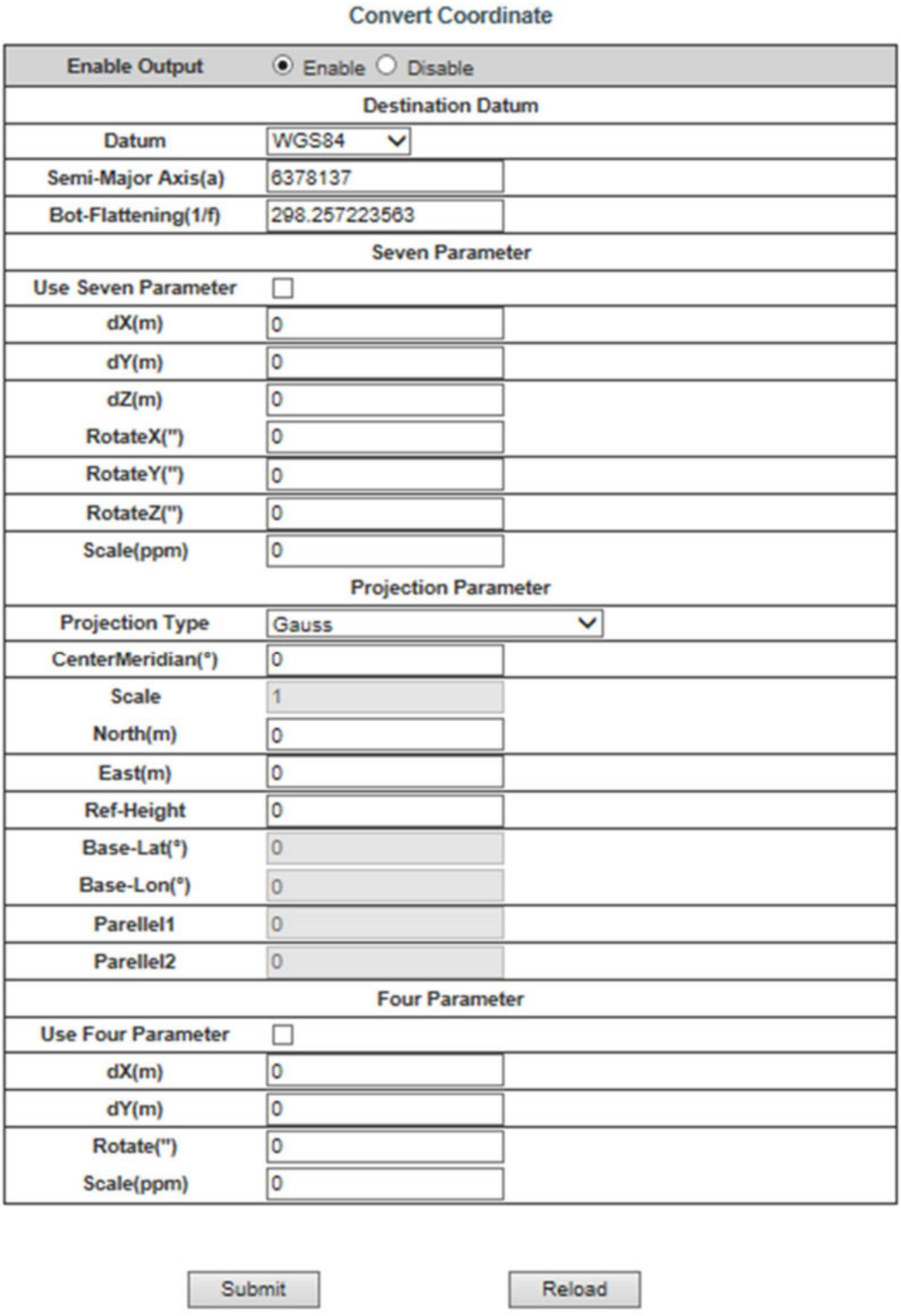
4.3.3 Tracking Satellites

In this page, you can select the satellites you do not want to track.



4.3.4 Convert Coordinate

This Page is used to convert the coordinates.



4.3.5 Network

This page is mainly set for the data link method used by SC600.

The Running Network

Priority Network	○ Wired Net ◉ Wireless Net ○ Mobile Net
Current Network	WAN
Default Gateway	192.168.3.1
DNS	114.114.114.114|8.8.8.8
PING	◉ Enable ○ Disable Timeout : (s) Counts :

Device Network Settings

Wired Net	◉ WAN
DHCP	◉ Enable ○ Disable
IP	192.168.3.129
Mask	255.255.255.0
Gateway	192.168.3.1
MAC address	0C:AE:7D:D9:B5:D7
Link Status	Link disconnected
Status	Route disconnected

Wireless Net	○ Client ◉ Hotspot ○ Disable
MAC address	0C:AE:7D:D9:B5:D8
SSID	SC22A9023004E
Password	NONE
IP	192.168.10.1

Mobile Net	◉ Enable ○ Disable
APN	3gnet
User	
Password	
IP	0.0.0.0
Mask	0.0.0.0
Gateway	0.0.0.0
Signal Level	0%
Mobile Isp	Unknown
Monet Link Status	PowerOFF
Monet Status	No internet access

FTP Server Settings

Anonymous Access	Enable
User	1
Password	•

NTP

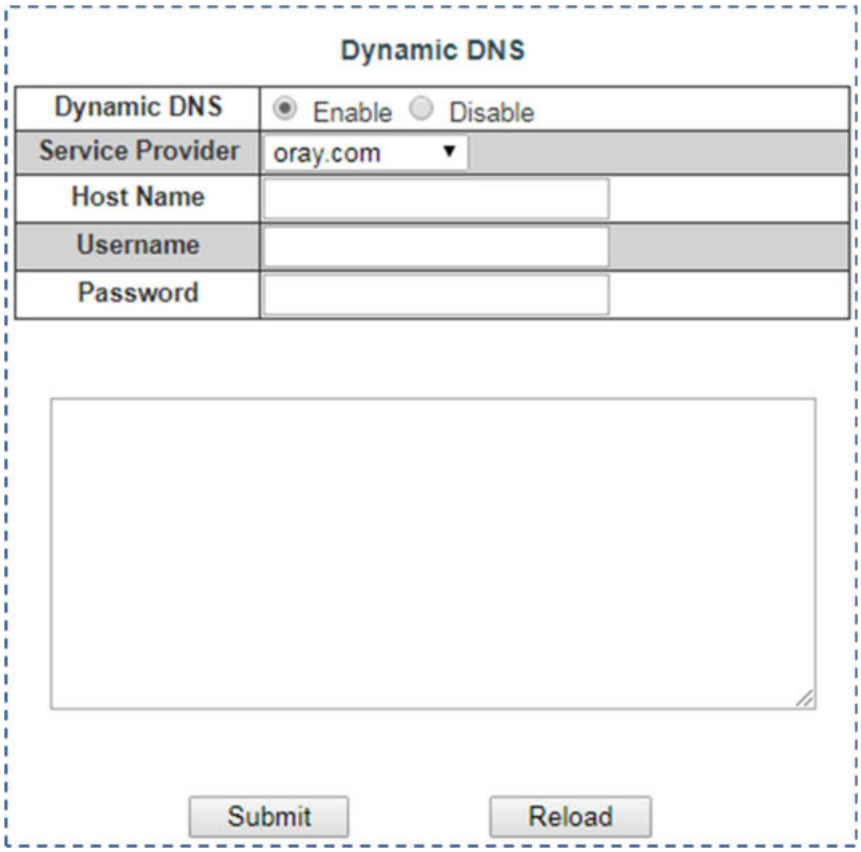
NTP Server	○ Enable ◉ Disable

Submit Reload

Wireless Net	◉ Client ○ Hotspot ○ Disable
DHCP	◉ Enable ○ Disable
SSID	PG PG Scan SSID
Password	22228888
IP	0.0.0.0
Mask	0.0.0.0
Gateway	0.0.0.0
MAC address	0C:AE:7D:D9:B5:D8
Bit Rate	0 Mb/s
Signal Level	0 dbm
Channel	0
Wifi Link Status	PowerOFF
WiFi Status	No internet access
Virtual AP	◉ Enable ○ Disable
SSID	SC22A9023004E
Password	NONE
IP	192.168.10.1

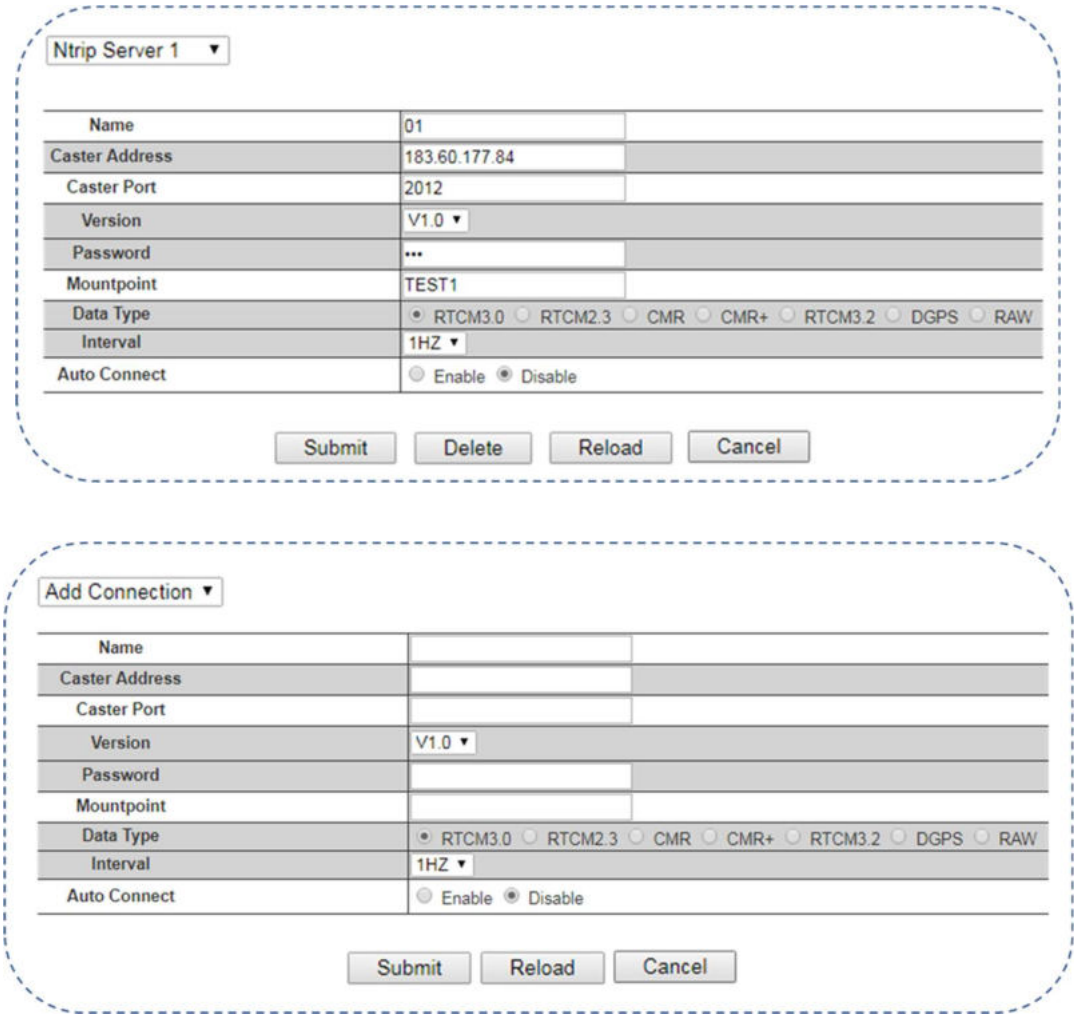
4.3.6 Dynamic DNS

This page is mainly set for dynamic DNS, service provider, host name, username, password.



4.3.7 NTRIP Server

In this page, you can set the transmission content and the server for the SC600 reference station.

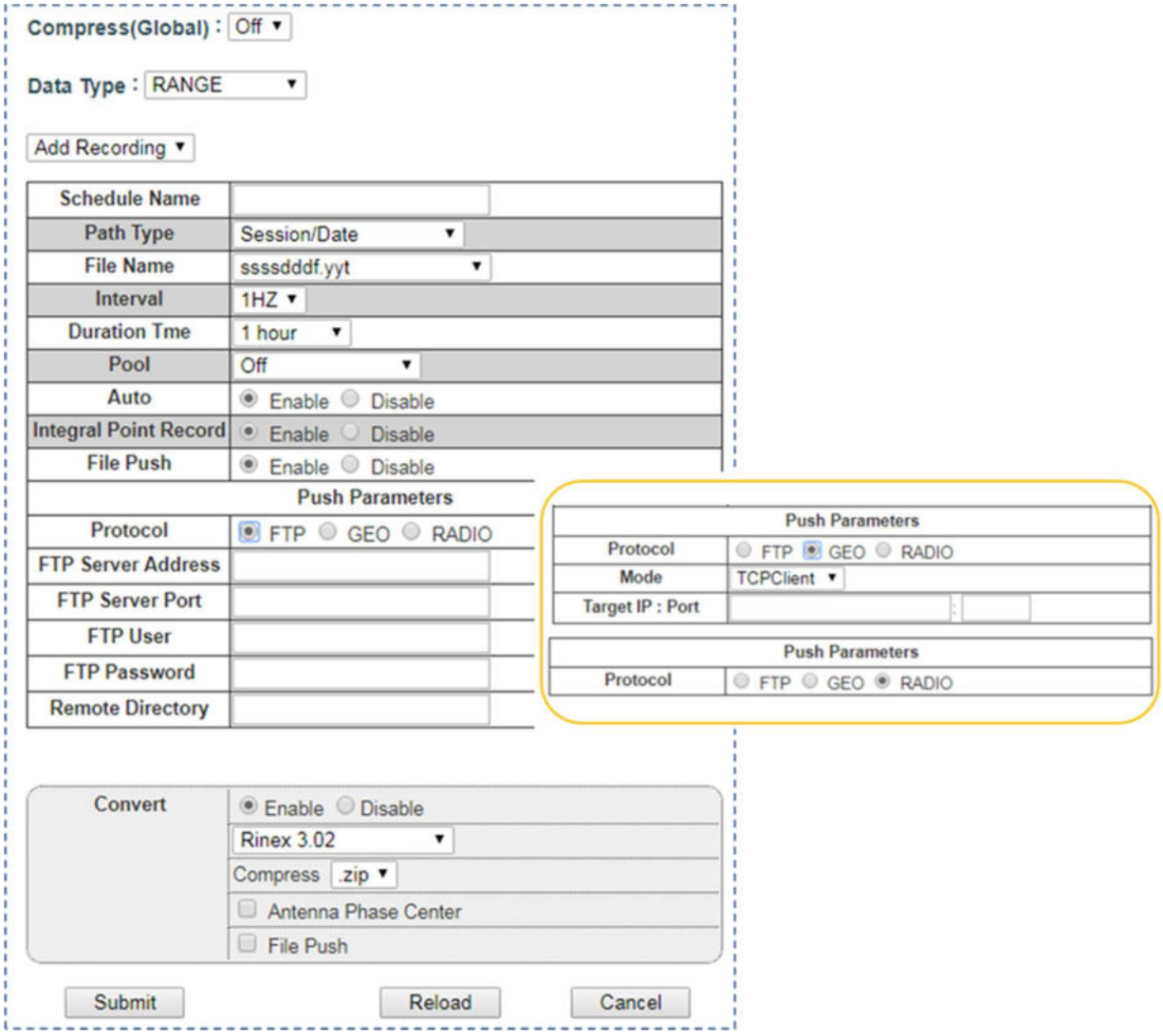


Note:

- The password in this page can be entered arbitrarily but cannot be empty.
- 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.
- 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 mainframe starts to blink. The above process is the establishment of a base station transmission.

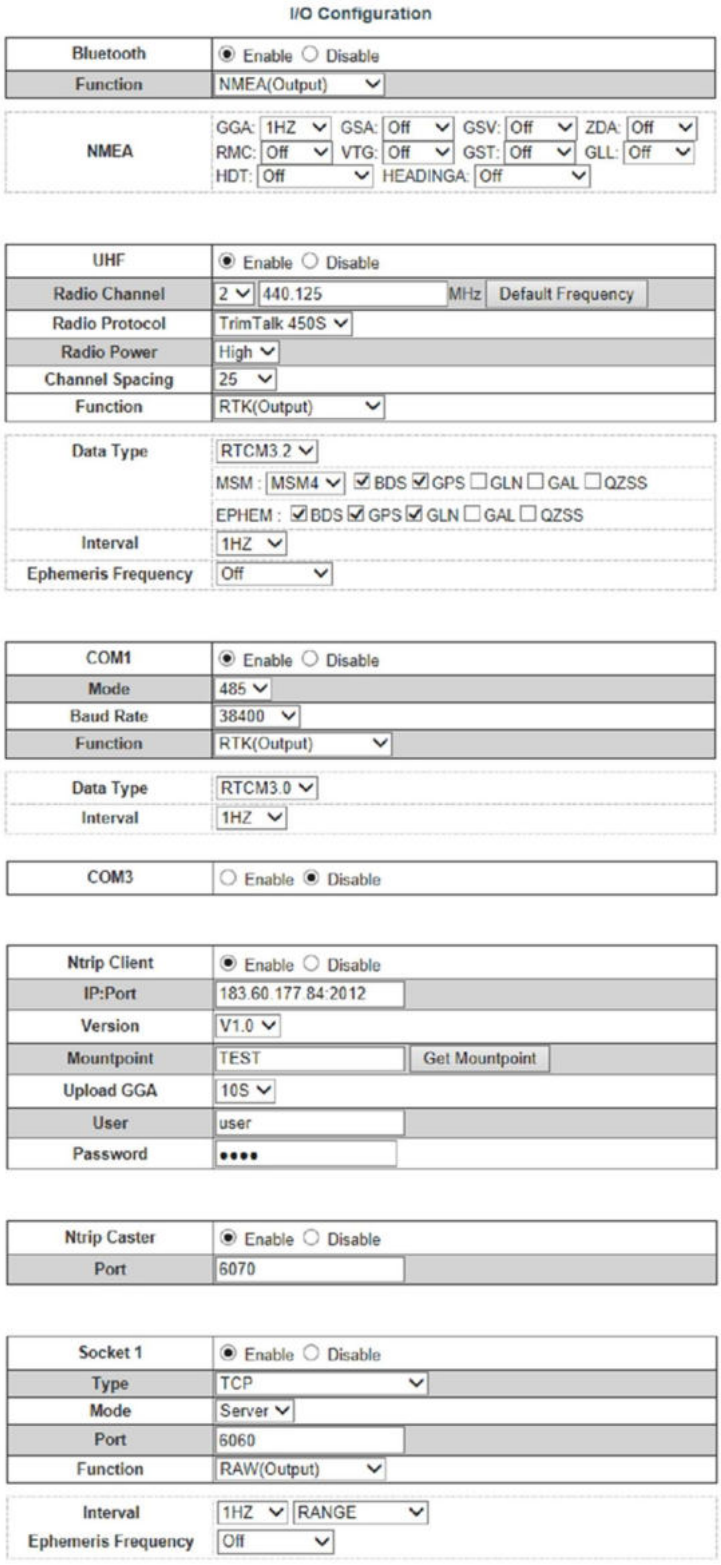
4.3.8 Recording

In this page you can set the configuration of data recording, enable/disable the file push and the file conversion.



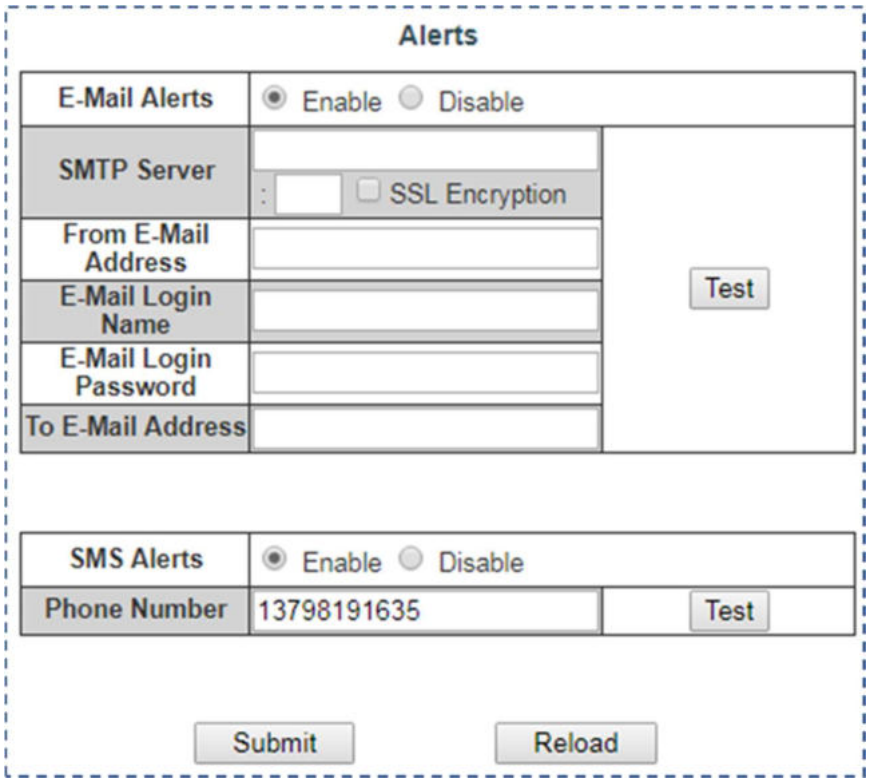
4.3.9 Port Configuration

This page is mainly set for Bluetooth, UHF settings, COM1, Ntrip Client, Ntrip Caster, Sockets 1-5.



4.3.10 Alerts

This page is mainly set for E-Mail and SMS alerts. If you want to send text messages, you need to use a mobile network.

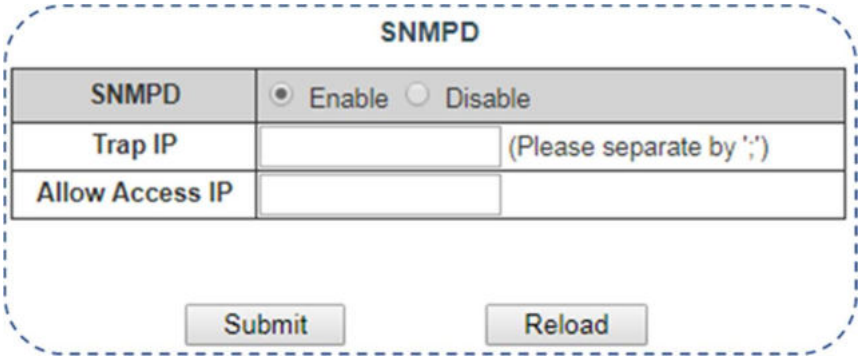


4.3.11 SNMPD

When you come to SNMPD, you can see 【Trap IP】and 【Allow Access IP】.

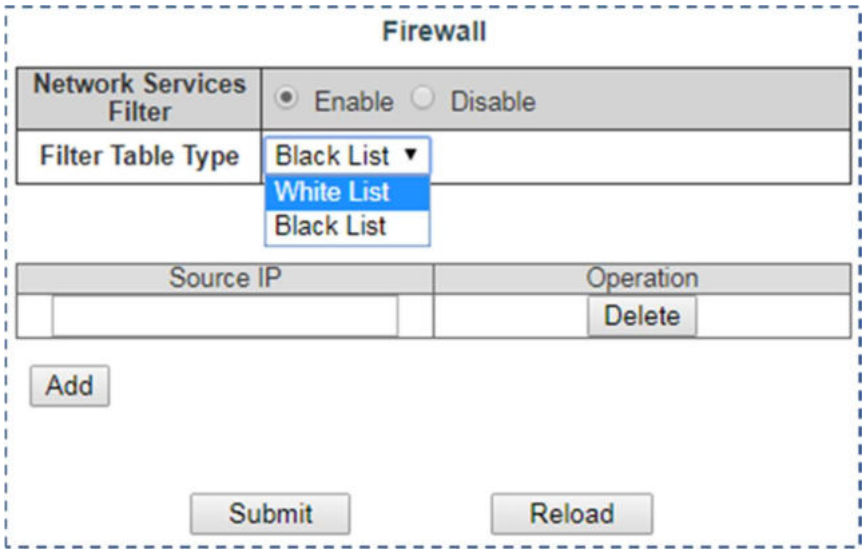
【Trap IP】: Receivers can specify some IPS and then automatically send information to those IPS

【Allow Access IP】: Receivers can allow some devices to proactively obtain information about receivers through IP addresses.



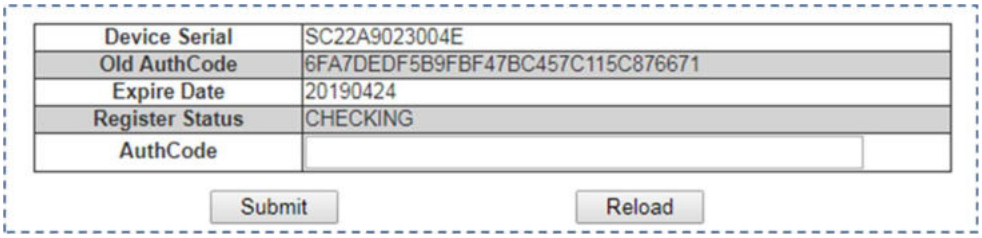
4.3.12 Firewall

On this page, you can choose whether to turn on the firewall.



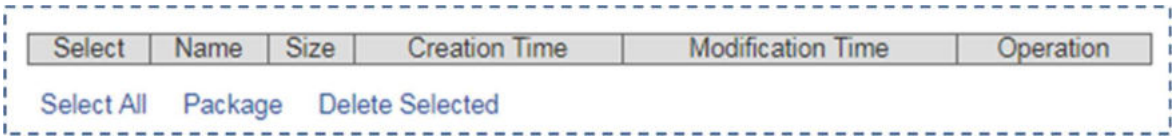
4.3.13 Registration

You can see registration information of receiver in this page.



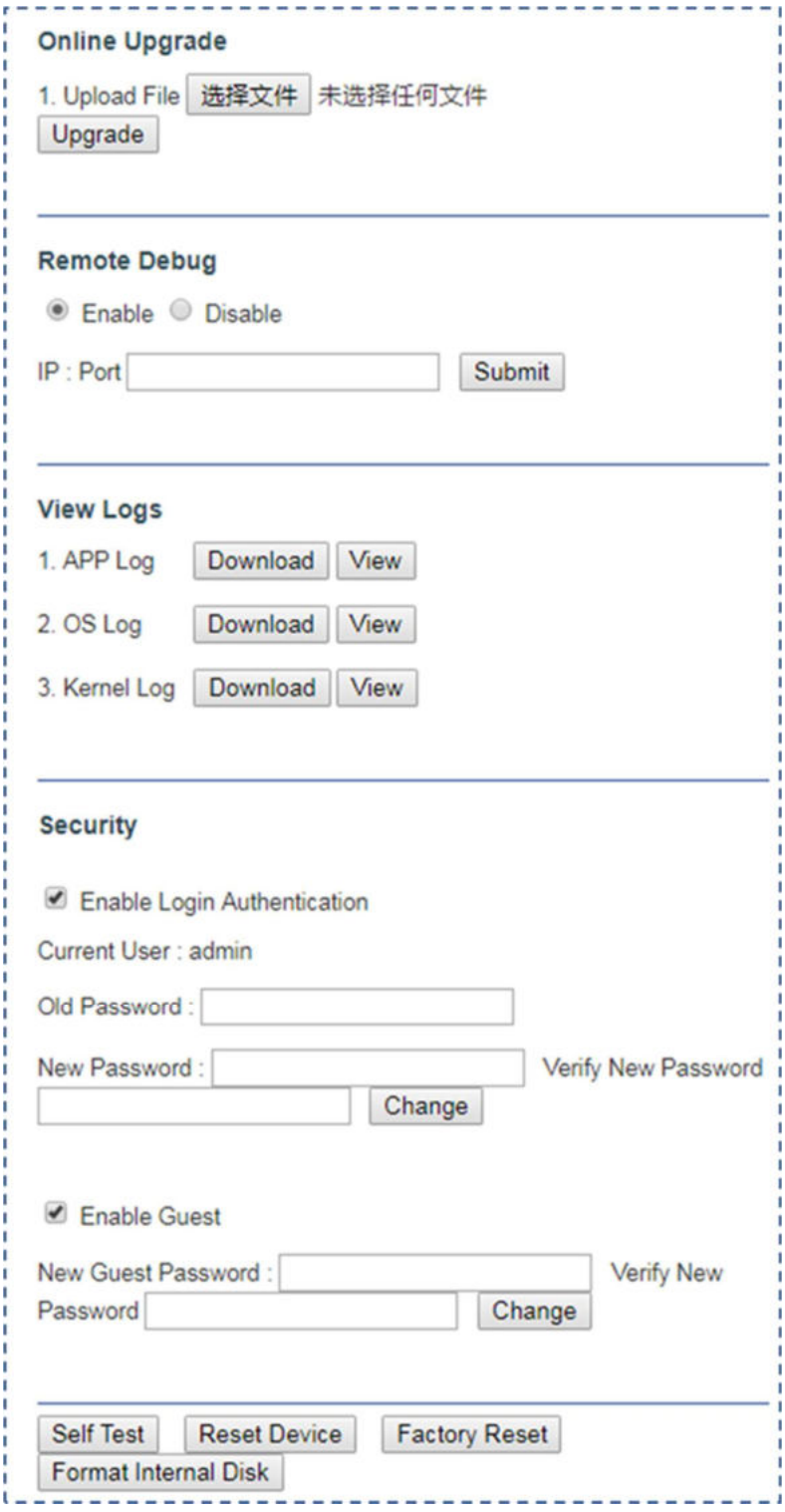
4.4 Download

On this page, you can download recorded files. Raw data can be converted on the fly. Files can be sent via FTP or email.



4.5 System Management

In this page you can update the receiver firmware, enable/disable the remote debugging and modify security settings.



4.6 Configuration Set

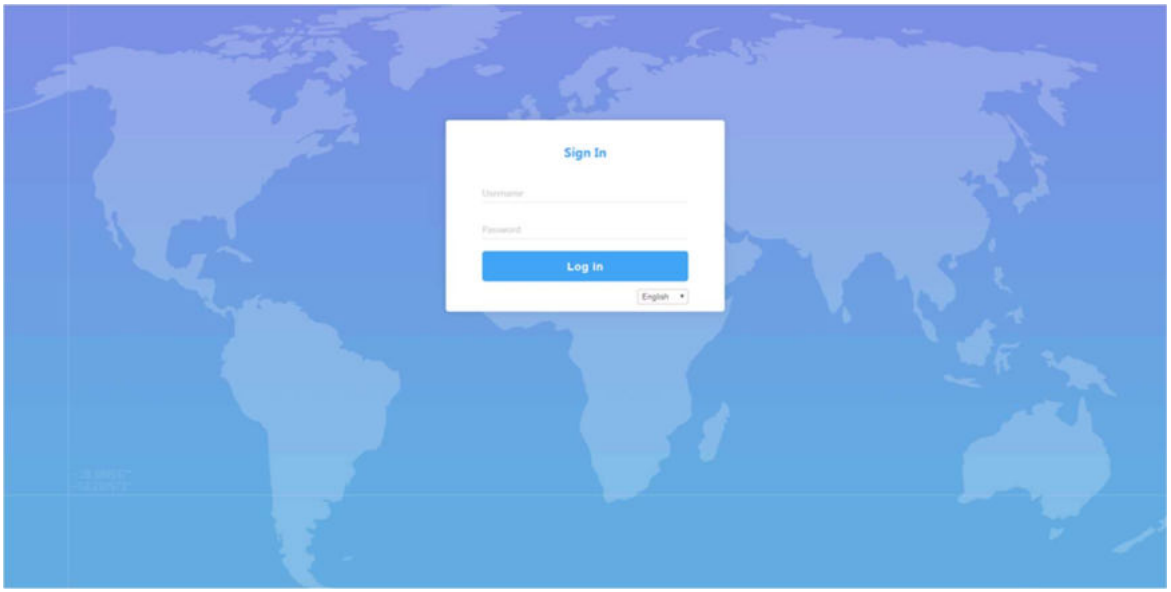
In this page you can download/upload configuration files.

4.7 Language

As you can see, SC600 has 4 languages to set up. They are Russian, English, Simplified Chinese, Traditional Chinese.

4.8 Log Out

When you click “Logout”,



5. Bundles

SC600 is available in 2 different version, Standard version with 5Hz as rate and Full version with Heading feature and 20Hz as rate.

Model:

Product Code	Description
B10-150602	Stonex SC600 GNSS, 555 Ch, 4G, UHF, WiFi, BT, 5Hz, Bundle
B10-150603	Stonex SC600 GNSS, 555 Ch, 4G, UHF, WiFi, BT, 20Hz, Heading, Bundle

List of **Standard** accessories

Product Code	Description
	Stonex SC600
n/a	Bracket
n/a	Carton Box
30-350298	Power cable, 2pin power cable, + - voltage
30-350317	Y Cable (DB26-DB9/Ethernet)

List of **Optional** accessories

Product Code	Description
30-350260	Power Adaptor with 3 plugs (US, UK and EU), 15V/2A, 2PIN
30-350315	2 PIN-SAE power cable
30-350310	DB26 box (included cable)
30-350174	Antenna GPRS/CDMA/WCDMA, SMAJ connector (QT0822D-S
30-350338	UHF antenna, 420MHz-450MHz, TNC, 10cm (AR-420)
30-350339	UHF antenna, 450MHz-470MHz, TNC, 10cm (AR-450)
30-357123	A45 GNSS Survey Antenna
30-350248	CSX607A GNSS Survey Antenna
30-357128	Stonex SA1500, GNSS 2D Choke Ring Antenna
30-350316	Cable 8 m for GNSS Antenna
30-357126	Cable 30 m for GNSS choke ring antenna

Appendix 1: Copyrights, warranty and environmental recycling

Copyrights and trademarks

STONEX®, the STONEX® logo, and SC600 GNSS receiver are trademarks of STONEX® Limited.

STONEX® Cube-a, STONEX® Cube-Connector are trademarks of STONEX® Limited.

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Release Notice

This is the January 2020 release of the STONEX® SC600 GNSS new model receiver user guide.

The following limited warranties give you specific legal rights. You may have others, which vary from state/jurisdiction to state/jurisdiction.

Standard Limited Warranty

Version 2020

The terms and conditions of this Limited Warranty constitute the complete and exclusive warranty agreement between The Customer or Dealer and STONEX® for the Product and supersedes any prior agreement or representation made in any STONEX® sales document or advice that may be provided to Customer by any STONEX® representative in connection with Customer's purchase of the Product. No change to the conditions of this Limited Warranty is valid unless it is made in written form and signed by an authorized STONEX® supervisor.

STONEX® warrants that its Products:

- Are free from defects in materials or workmanship for generally 1 year;
- Accessories or specific parts for which different limited warranty period shall apply;
- Have been tested/calibrated in proper working status prior to shipment.

The warranty period starts from date of first sale of the instruments. At its sole discretion, under the warranty period, STONEX® will repair the product or send parts for replacement at its expense. STONEX® agrees to repair or replace the defected instrument within thirty (30) days only if STONEX® Europe recognizes that the defects of the instrument are not caused by human factors or no obvious damage to its surface is visible. STONEX® warrants any new replaced parts or products are warranted to be free from defects in materials and workmanship for thirty (30) days or for the remainder of the Limited Warranty Period of the Product in which they are installed, whichever is longer. Faulty Parts or Products replaced under this Limited Warranty shall become property of STONEX®. All products that have to be repaired have to be returned to our technical representative office location via any delivery company the customer prefers, nevertheless STONEX® is not accountable for the unlikely event that the Products gets lost in transit. Any damage inflicted by the customer or by third party after the products has been delivered to the customer is excluded from the limited warranty as well any damage arising from an improper use, from any action or use not provided for in the enclosed user guides and/or manuals.

Shipping policy

The Customer or the dealer is required to pay for the charges for shipping of fault parts or instruments to STONEX® representative office and STONEX® is providing the shipping for return. Dealers need to follow STONEX® repair/service procedure to achieve a better and prompt service result.

Firmware/Software warranty

Stonex doesn't warrant that operation of Firmware/Software on any instruments will be uninterrupted or error-free, or that functions contained in Firmware/Software will operate to meet your requirements.

Stonex will forward the Software/Firmware Fix to the dealer or customer. Firmware/software Fix means an error correction or other update created to fix a previous firmware version that substantially doesn't conform to the instruments specification.

Over Warranty repair(s) policy

Customer shall pay the standard repair fees for any service (whether part replacement or repairs) and performed by STONEX® under request and explicit authorization of the customer itself. In this case the customer is charged for return shipment's fees as well.

Disclaimer and Limitation of Remedy

All other express and implied warranties for this product, including the implied warranties of merchantability and fitness for a particular purpose and/or not infringement of any third party's rights, are hereby disclaimed. Stonex® expressly disclaims all warranties not stated in this limited warranty. Any implied warranties that may be imposed by law are limited in duration to the term of this limited warranty. Some jurisdictions do not allow the exclusion of implied warranties or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to customer. Customer must read and follow all set-up and usage instructions in the applicable user guides and/or manuals enclosed. If customer fails to do so, this product may not function properly and may be damaged. Customer may lose data or sustain personal injuries. Stonex®, its affiliates and suppliers do not warrant that operation of this product will be uninterrupted or error free; as do all electronics at times. If this product fails to work as warranted above, customer's sole and exclusive remedy shall be repair or replacement. In no event will Stonex®, its affiliates or suppliers be liable to customer or any third party for any damage in excess of the purchase price of the product. This limitation applies to damages of any kind whatsoever including (1) damage to, or loss or corruption of, customer's records, programs, data or removable storage media, or (2) any direct or indirect damages, lost profits, lost savings or other special, incidental, exemplary or consequential damages, whether for breach of warranty, contract, tort or otherwise, or whether arising out of the use of or inability to use the product and/or the enclosed user guides and/or manuals, even if Stonex, or an authorized Stonex® representative, authorized service provider or reseller has been advised of the possibility of such damages or of any claim by any other party. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages for some products, so the exclusions or limitations may not apply to customer. This limited warranty gives customer specific legal rights, and customer may also have other rights which vary from country/state/jurisdiction to country/state.

Instruments

One (1) year on STONEX® Products:

GNSSS receiver: SC600 GNSS Series.

Accessories

Accessories & Specific Parts Warranty

For Accessories provided by Stonex with the instruments SC600 GNSS the following general warranty time is for reference:

- Battery charger: 1 year.
- Adapters for battery charger, Cables: 1 years.

Environmental recycling

The cardboard box, the plastic in the package and the various parts of this product have to be recycled and disposed of in accordance with the current legislation of your Country.

For countries in the European Union (EU)

The disposal of electric and electronic device as solid urban waste is strictly prohibited: they must be collected separately.

Contact Local Authorities to obtain practical information about correct handling of the waste, location and times of waste collection centre. When you buy a new device of ours, you can give back to our dealer a used similar device.

The dumping of these devices at unequipped or unauthorized places may have hazardous effects on health and environment.

The crossed dustbin symbol means that the device must be taken to authorize collection centres and must be handled separately from solid urban waste.

For countries outside European Union (EU)

The treatment, recycling, collection and disposal of electric and electronic devices may vary in accordance with the laws in force in the Country in question.

Appendix 2: Safety Recommendations

Warnings and Cautions

An absence of specific alerts does not mean that there are no safety risks involved in the use of this equipment.

Always follow the instructions that accompany a Warning or Caution, reported in this.

This information is intended to minimize the risk of personal injury and/or damage to propriety. In particular, observe safety instructions that are presented in the following form:

WARNING - A Warning alerts about risk for health and/or damage to the propriety. A warning identifies the nature of the risk and the extent the possible injury and/or damage. It also describes how to protect yourself and/or the equipment from this risk.

CAUTION - A Caution alerts about a possible risk of damage to the equipment and/or loss of data, but no risk for human safety.

Wireless Module Approval

The receivers use internal wireless modules. Regulations regarding the use of the modem vary greatly from country to country. In some countries, the unit can be used without obtaining an approval license. Other countries require specific approval or auto certification by the set maker.

Before using this instrument, check if authorization to operate the receiver is required in your country. It is the responsibility of the importer to verify if it is necessary a certification or license for the equipment in the country of use.

Instrument Approval

Covers technical features of the equipment relatives to electromagnetic emissions that can cause interference and disturbances to other instruments (note like emc compatibility) or generate not correct functionalities of the instrument itself. Approval is granted by the manufacturer of the equipment. Some countries have unique technical requirements for operation in particular frequency bands. To comply with those requirements, Stonex Srl may modified the equipment to be subjected to grant.

Unauthorized modification of the units voids already got approvals, the warranty time and the operational licenses of the instrument.

UHF 410-470 MHz / 902.4-928 MHz Data transceiver

General Antenna Installation Warning

1. All antenna installation and servicing are to be performed by qualified technical personnel only. When servicing the antenna, or working at distances closer than those listed below, ensure the transmitter has been disabled.

2. Typically, the antenna connected to the transmitter is a directional (high gain) antenna, fixed mounted on the side or top of a building, or on a tower. Depending upon the application and the gain of the antenna, the total composite power could exceed 90 watts ERP. The antenna location should be such that only qualified technical personnel can access it, and that under normal operating conditions no other person can touch the antenna or approach within 0.6 meters of the antenna.

You can see below a table showing the Antenna Gain versus Recommended Safety Distance:

	Antenna Gain		
	0-5 dBi	5-10 dBi	10-16.5 dBi
Minimum RF safety-distance	0.6 meters	1.06 meters	2.3 meters

For USA: The FCC has adopted a safety standard for human exposure to radio frequency electromagnetic energy. Proper use of this radio modem results in exposure below government limits. The following precautions are recommended:

DO NOT operate the transmitter when someone is located less than 20 cm (7.8 inches) of the antenna.

DO NOT collocate (place within 20 cm) the radio antenna with any other transmitting instruments.

DO NOT operate the transmitter unless all RF connectors are secure, and any open connectors are properly terminated.

DO NOT operate the equipment near electrical blasting caps or in an explosive atmosphere.

All equipment must be properly used according to the installation instructions for safe operation.

All equipment should be repaired and calibrated only by a qualified technician

For Europe

The European Community provides some Directives for the electronic equipment introduced on the market.

All the relevant information's are available on the European Community website:

http://ec.europa.eu/enterprise/sectors/rtte/documents/

The text of the Directive 99/05 regarding telecommunication equipment is available, while the applicable Directives (Low Voltage and EMC) are available at:

http://ec.europa.eu/enterprise/sectors/electrical

FOR USA

For your own safety, and in terms of the RF Exposure requirements of the FCC always observe the precautions listed here.

- Maintain a minimum separation distance of 20 cm (7.8 inches) between yourself and the radiating antenna.
- Do not collocate (place within 20 cm) the radio antenna with any other transmitting device.

Bluetooth/WIFI radio Module

The radiated output power of the internal Bluetooth module of this equipment is far below the FCC and EU radio frequency exposure limits. In any case, be sure to use the equipment with the radio far at least 20 cm from the human body. The Bluetooth module match the guidelines found in radio frequency "safety standards and recommendations "published by Scientific organizations.

Stonex srl therefore believes the internal wireless radio is safe for use by end users. The level of energy emitted is far less than the electromagnetic energy emitted by wireless devices such as UMTS phones. However, the use of Bluetooth/WIFI may be restricted in some special situations or place, like aircraft, hospital,etc. If you are unsure of existence of restrictions, you should ask for authorization before switching on the Bluetooth radio.

Recommendation for installing antennas for internal radios

An absence of specific alerts does not mean that there are no safety risks involved in the use of this equipment.

Always follow the instructions that accompany a Warning or Caution, reported in this. This information is intended to minimize the risk of personal injury and/or damage to propriety. In particular, observe safety instructions that are presented in the following form:

CAUTION

For your own safety, and to match the RF Exposure requirements of the FCC, always observe these precautions:

Always maintain a minimum separation distance of 20 cm (7.8 inches) between yourself and the radiating antenna.

Do not collocate (place within 20cm) the radio antenna with any other transmitting device.

Do not switch on the GSM or UHF module without the antenna mounted to the external connector.

UHF Antennas having a gain greater than 5 dBi, are strictly prohibited for use with this device. The required antenna impedance must be 50 ohms.

Default Radio Configuration

The internal radio TRM121 can transmit on the 410-470MHz and 902.4-928 MHz band; users can choose radio channel and radio protocol through the handheld software or WEB interface. The default frequency of each channel is in the following table.

Channel	Frequency
1	438.125 MHz
2	440.125 MHz
3	441.125 MHz
4	442.125 MHz
5	443.125 MHz
6	444.125 MHz
7	446.125 MHz
8	447.125 MHz

Main features and general performance of the internal radio are summarized below.

General performance	
Frequency range	Fixed frequency: 410-470 MHz
	Hopping frequency: 410-470 MHz and 902.4-928 MHz
Band width	Fixed frequency: 12.5 KHz, 25 KHz
	Hopping frequency: 280 KHz
Modulation scheme	Hopping frequency: GMSK
	Fixed Frequency: GMSK, 4FSK
Transmitter	
RF output power	High power (1.0 W)
Modem	
Rate	Fixed frequency: 9600bp, 19200bps
	Hopping frequency: 115200bps
Modulation	GMSK

STONEX

STONEX® SRL

Viale dell'Industria, 53 - 20037 Paderno Dugnano (MI)

Tel: +39 02 78619201

www.stonex.it | info@stonex.it