STONEX S800
GNSS Receiver
User Manual

Contents

1. Introduction to Stonex S800 GNSS

Thank you for choosing our products. STONEX®, as a leading RTK manufacturer, is committed to providing the most advanced GNSS surveying tools.

This manual applies to S800 products, containing instructions for installing, configuring the product and operating it. Even if you have used other RTK products of ours before, we recommend that you spend some time reading this manual for better user learning.

S800 is a super miniature GNSS RTK receiver of STONEX®. With brand-new appearance design and solid magnesium alloy structure, it supports GPS, GLONASS, BeiDou and Galileo satellite navigation system, which meets accuracy demands of modern surveying to provide reliable surveying results and user friendly operation.

S800 brings you the utmost experience.

If you are not familiar with GNSS technology, we suggest you to read a specific book in order to understand in the best way the contents of this manual.

Anyway, you can ask for any technical support by sending an email to our address support@stonex.it or contacting your local dealer.

2. Key features

- Multi-constellation system. Supports BeiDou, GPS, GLONASS and Galileo multi-system navigation and positioning.
- Compact and convenient. High integration.
- IP67 Waterproof and Dust Proof Rating. Shock resistant.
- Highly integrated internal antenna. Zero phase center offset.
- Onboard 8G memory.
- Powerful battery endurance with over 10 hours' continuous operation.

3. Precaution

Transportation: during the transport, the receiver and its accessories must be reasonably placed in its transport container, to protect against shock and vibration. Specially note that S800 contains a non-removable internal Lithium Battery, whose national and international regulations must be observed and fulfilled in transportation.

Storage: before storage, discharge battery below 30%. After storage recharge batteries before using. A proper storage temperature in a dry environment is recommended to minimize self-discharging of the battery. Keep the receiver dry in storage and before using.

Cleaning and Drying: use only a clean, soft, lint-free cloth for cleaning. If necessary, moisten the cloth with water or pure alcohol. In all kinds of weather conditions, after coming back from the field, dry the product, the transport container, the foam inserts and the accessories. Pack them after they have dried. Keep plugs clean and dry. Wet connectors must be dry before attaching the dust cap.

4. S800 Surveying System

S800 surveying system consists of three main components, namely receiver, handheld and accessories. In the following parts are their introductions.

4.1 S800 Receiver

4.1.1 Receiver appearance

The receiver's dimension is 146mm*146mm*76mm, weighting 1.2kg, with its appearance as illustrated in Figure 4-1. The front side is control panel, consisting of 1 power button and 4 indicators. The bottom are interfaces of UHF antenna and cables.
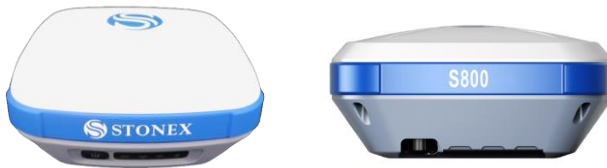
Figure 4-1 S800 Receiver

4.1.2 The bottom of Receiver

At the bottom of the receiver is labelled system-unit serial number. The bottom interfaces are illustrated in Figure 4-2, with covers for dust and water prevention.

Figure 4-2 Receiver bottom

TNC interface: connect internal radio antenna.
2-pin LEMO port: charge for internal battery, connect adaptor.
5-pin LEMO port: connect external power supply and external radio
7-pin LEMO port: connect PC or handheld, USB+serial port

4.1.3 Control Panel

Control Panel is illustrated in Figure 4-3.

Figure 4-3 Control Panel

Table: Indicator function description

Indicator	Status	Description
Power button	On: sufficient power Fast flashing (1s): low power (below 10%) Slowly flashing (3s): charging	When the S800 receiver is powered on, the power indicator will be lit. According to battery power, the power indicator shows the following three different statuses: 1. On (Green): sufficient power supply 2. Fast flashing: power below 10%, indicator flashing once per second 3. Slowly flashing: charging, indicator flashing once per 3 seconds

Note: Most often, when power indicator is fast flashing, the internal battery can support receiver to continuously work for only 1 hour. The indicator shows both statuses of internal battery and external power, and when the receiver connects to external power, the indicator will automatically switch to showing status of external power. |

Satellite led	Blink: Lock satellites Off: invalid solution (Lock no satellite)	This led shows the amount of locked satellites. When the receiver locks more than one satellite, the led will start flashing in a loop per 30 seconds, and the number of flashes is the number of the satellites locked by the receiver. When the receiver locks no satellite, it's off.
Data link led	Flashing: data is transmitting	When the receiver starts to transmit or receive data, the led starts flashing.
WIFI led	On: WIFI on Off: WIFI off	When WIFI is on, the led is lit green. When the WIFI is off, the led is off.
Bluetooth led	On: Bluetooth has connected. Flashing: Bluetooth has connected and is receiving differential data. Off: no connection	When receiver is connected to handheld or other instruments by Bluetooth, the led will be lit blue. When receiver has connected to other instruments by Bluetooth and is receiving differential data, the led will be flashing. When receiver doesn't use Bluetooth, the led won't be lit.

4.1.4 Mode View and Mode Switch

Mode view

When receiver is powered on, flip the power button and then it will voice broadcast the current working mode and data link.

Mode switch

When the receiver is powered on, connect it with handheld or other instruments so as to set up and switch the working mode of receiver.

4.1.5 Receiver Self-check

Self-check functionality is to check whether every module works normally. When S800 receiver has indicators off or module doesn't work normally, you can use self-check to inspect the receiver. S800 self-check consists of four parts, namely GPS, radio, WIFI and Bluetooth. The self-check results will be voice broadcasted in the process. Self-check operation and result broadcast are as followed:

a) When receiver is powered on, press power button and hold it until the receiver voice broadcasts "power off". Press it again until the receiver sounds a beep and voice broadcasts "self-check", which means the receiver starts to operate self-check. (New receiver is recommended to operate self-check at least once).

b) In the process of self-check, each module inspection is followed by its inspection result. If the module inspection passes, it will voice broadcast "OK" and module led keeps on until the whole self-check finishes. If the module inspection fails, it will voice broadcast current module inspection fail, keep module led flashing and buzzer sounding until you restart the receiver. Self-check lasts for about 1 minute. If there is self-check failure, please contact local dealer.

c) If every module indicator is lit with no flashing, and voice broadcast says every module work normally (such as "GPS self-check. OK."), it means all the modules work normally. Receiver starts to work after the whole self-check finishes.

5. Standard Accessories

5.1 Transport container

There are two kinds of S800 containers: Rover container and Base container. These two containers have similar appearances but their insert layouts are different. (S800 containers are still under production).

5.2 Adaptor

S800 receiver adopts internal battery. You can use adaptor to charge the receiver.

5.3 UHF Antenna

When receiver is in internal radio mode, UHF antenna (as illustrated in Figure 2-20) is in need.

UHF antennas have 3 models, respectively covering 3 frequency ranges as shown in Table 2-6.

Table: UHF antenna models

Model	QT410A-1	QT440A-1	QT450A-1
Frequency (MHz)	410~430	430~450	450~470

5.4 7-pin Serial Cable

One end of the 7-pin serial cable, the 7-pin serial port, is to connect the receiver, and the other end of the cable, the USB and the D89 interface are for data communication respectively with PC and handheld as illustrated in Figure

Figure 5-1 7-pin serial cable

5.5 Other Accessories

Other accessories include glass mounting pole, controller holder, connector, tray and measuring tape and other accessories.

Figure 5-2 Glass fiber mounting pole

Figure 5-3 Controller holder

Figure 5-4 Connector

Figure 5-5 Tray

Figure 5-6 Measuring tape

6. Static Surveying

6.1 Static Surveying Introduction

Static Surveying is an GPS positioning measurement by installing three or more GNSS receivers at different measuring stations to measure simultaneously so as to get the relative positions of measuring stations.

Scope of application:
- the establishment of national geodetic control network (second or the following class).
- the establishment of precise engineering control network, such as bridges measurement, tunnel measurement.
- the establishment of various densified control network, such as city measurement, mapping control point measurement, road measurement and boundaries location.
- GPS measurements including control survey used for mapping, cadastral surveying, land information, real estate surveying, geophysical prospecting, surveying and building construction in small and medium-sized cities and towns, which should meet the accuracy demand of D or E class GPS measurement.

6.2 Static Surveying Operation

a) Set up the tripod at the measuring station, switch the receiver to static mode and attach it to the tribrach, centering and leveling it in strict standard.
b) Measure the height of antenna.
c) Record names of station and receiver, height of receiver, measurement start time, measurement end time, observation session and satellite number.
d) Static data logging: Power on the receiver and make sure it is in static mode. Receiver starts to search satellites and satellite led starts to be flashing. When it meets the record demand, the satellite

led will be flashing at default sampling interval, and one flash represents having logged an epoch.

   e) Power off the receiver after finishing data logging, and then download the data to execute post processing.

   f) 3.1.3 Design Principles of GPS Control Network.

1）In order to ensure the continuous tracking of satellites and quality of satellite signal, set up the GPS measuring station in locations which are free of obstructions, where the altitude angle of obstacles should be less than 15° in the field of view.

2）In order to reduce or avoid interruption caused by electromagnetic wave to satellite signal, set up the measuring station away from high-power radio source (such as television station, broadcasting station and microwave station). Also there should be no object nearby that can strongly reflect satellite signal (such as large-scale buildings).

3）Measuring station should have convenient transportation and stable ground foundation, easy for state holding and beneficial for extension of other measuring method and joint measurement.

6.3 Data acquisition method

There are 2 acquisition methods of data: manual start and automatic start. Open the Survey software (example here is SurPad) on the handheld, click "Device" – "Communication", choose the receiver model and the communication mode. There are Bluetooth and WIFI like communication modes.

a. Manual start

Click "Device" - "Working mode", choose "Static". At here, you can configure static parameters, antenna parameters and satellite system.

b. Automatic start

Click "Device" - "Working mode", choose "Static". At parameter settings, choose auto record static data and at the next time when the receiver is

powered on, it can automatically start static data logging with no need to reset.

6.4 RTK Dynamic Measurement (Radio)

RTK dynamic measurement (base and rover) has radio mode and network mode, which two differs from each other in their ways of transmitting differential signal.

6.4.1 Installation of Base

（1）Set up the tripod in location with known coordinates or unknown coordinates, level it and attach the receiver on it.
（2）Set up the receiver according to the chosen data link. If using the internal radio transmission, attach the internal radio antenna into the UHF antenna port of receiver; if using external radio transmission, connect the external radio to 5-pin port with 5-pin cable.
（3）Power on the receiver and select base mode.

6.4.2 Start of Base

Open SurPad on the handheld to choose communication mode. Click "Device" - "Working mode" to choose base mode and configure its start up mode, parameters, data link and satellite system and other settings.
Base has 2 start up modes.

a. Use Current Coordinates
Base uses approximate WGS-84 coordinates of current location as base coordinates.
b. Input Base Coordinates
User specified base coordinates: the specified base coordinates cannot be far away from the precise WGS-84 coordinates of the current location, otherwise the base cannot work.

6.4.3 Installation of Rover

After the installation of base, start to install rovers.

（1）Fix the bracket on the pole, fix the handheld to the bracket and then install the rover on the pole.

（2）Attach the internal radio antenna or connect the external radio according to the chosen data link.

（3）Power on the receiver and select rover mode.

6.4.4 Configuration of Rover

Open SurPad software on the handheld to choose communication mode. Click "Device" - "Working mode" to choose rover mode and configure its data link, antenna parameters and satellite system and other settings. When data link is internal radio, you need to configure the radio channel, frequency, protocol and power.

Note:

1. If you want an high-precision surveying result (several cm), it's recommended to use a tripod to install rover;
2. When the coverage of surveying area is large (over 4 km from base), the working distance too far for internal radio to meet the demand, it's recommended to use external radio to connect the receiver;
3. Under radio mode, frequency and protocol settings of base and rover should be the same.

6.5 RTK Dynamic Measurement (Network)

6.5.1 Installations of Rover

Because RTK network mode is transmitting differential data by network, differing from radio mode only on their transmission method, the installations of the rover is similar to the UHF procedure.

6.5.2 Configuration Rover

Open SurPad on the handheld to choose communication mode. Click "Device" - "Working mode" to choose rover mode and configure its data link, antenna parameters and satellite system. When data link is handheld network, you can configure IP, COM port and AP and other settings. It can also operate as a RTK by getting access to server through handheld network, using the handheld network module to get into internet. After connection to the server, the received differential data can be transmitted to receiver so as to realize that receiver can be a network RTK without SIM card.

7. Web UI Application

S800 receiver has Web UI functionality. By getting access to its internal hotspot, you can easily manage it on the Web UI. As long as you have a smart phone, PC or handheld with WIFI functionality, you can easily connect to the S800 receiver to view status, download data and configure the receiver.

S800 receiver is default to open WIFI automatically when it's powered on. Use smart phone/PC/handheld to search the receiver hotspot, whose name is its serial number, and connect it. (Receiver WIFI only supports getting access to Web UI to check status and set up mode, not for Internet connection.)

After connecting to the S800 receiver WIFI, open the browser and enter "192.168.10.1" in IP address. A window pops up and asks for user and passport. The default user and password are shown as following:

User: admin   **Password: password**

And then you can login the Web UI of S800 receiver.

7.1 Status

In Status, you can check the current status of receiver, including position, data link, satellite and device information. You can see detailed information with respective tap as illustrated in Figure 7-1.

Figure 7-1: Position Information

7.2 Settings

In Settings, there are 6 options, namely working mode, satellite settings, device configuration, NMEA message, view logs and configuration set. At here, you can configure the receiver working mode, satellite system, system parameter and NMEA information. You can also view and download logs, and upload, download, delete and apply related configuration. You can see detailed information with respective tap as illustrated in Figure 7-2.
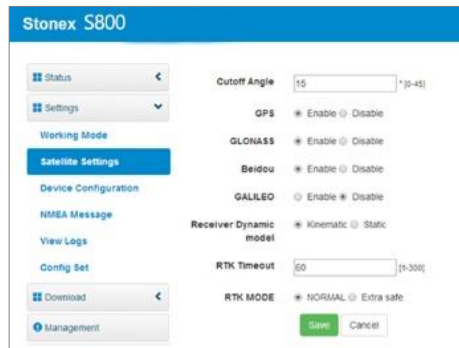
Figure 7-2: Satellites settings

7.3 Download

In Download, it provides download of raw data and backups data. You can see detailed information with respective tap as illustrated in Figure 7-3.
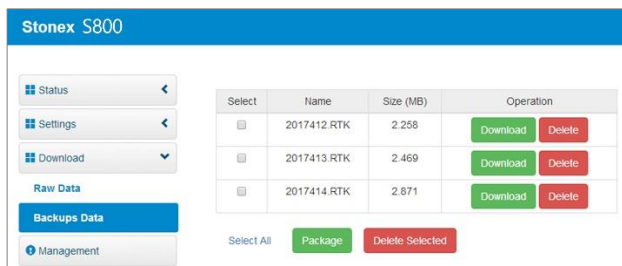
Figure 7-3: Backups data

7.4 Management

In Management, it provides online update, device register, password modification, device disk formatting, self-test, restore factory settings and reset as illustrated in Figure 7-4.
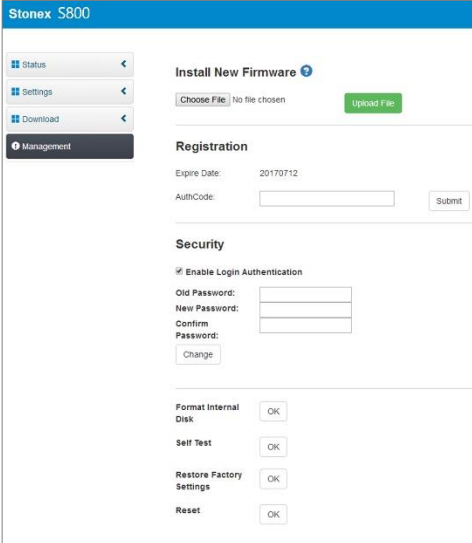
Figure 7-4: Management

7.4.1 Device Register

The register code consists of 32 digits and letters. You can register the device via WEB UI. The detailed steps are shown as followed:

In management page, you can see "registration". Input register code and click submit, and then registration is done. After registration, you can check the expiration time of current registration in the page.

You can also register device via controller. Open SurPad software on the handheld and connect the receiver. Click "About" - "Register instrument", then input code and registration is done.

Appendix 1: S800 Receiver Specification

RECEIVER

Satellite Tracked	GPS: L1 C/A, L1C, L2C, L2P, L5
	GLONASS: L1 C/A, L2C, L2P, L3, L5
	BEIDOU: B1, B2, B3
	GALILEO: E1, E5 AltBOC, E5a, E5b, E6
	QZSS: L1 C/A, L1C, L2C, L5, L6
	SBAS: L1, L5
	IRNSS: L5
Channels	555
Position Rate	5 Hz
Signal Reacquisition	< 1 sec
RTK Signal Initialization	Typically < 10 s
Hot Start	Typically < 15 s
Initialization Reliability	> 99.9 %
Internal Memory	8 GB

POSITIONING[1]

HIGH PRECISION STATIC SURVEYING	
Horizontal	2.5 mm + 1 ppm RMS
Vertical	5.0 mm + 1 ppm RMS
CODE DIFFERENTIAL POSITIONING	
Horizontal	<0.5 m RMS
Vertical	<1.0 m RMS
SBAS POSITIONING	
Horizontal	<0.6 m RMS[2]
Vertical	<1.2 m RMS[2]
REAL TIME KINEMATIC (< 30 Km) – NETWORK SURVEYING[3]	
Fixed RTK Horizontal	8 mm + 1 ppm RMS
Fixed RTK Vertical	15 mm + 1 ppm RMS

INTEGRATED GNSS ANTENNA

High accuracy four constellation micro-strip antenna, zero-phase center, with internal multipath suppressive board

INTERNAL RADIO

Type	Tx - Rx
Frequency Range	410 - 470 MHz
Channel Spacing	12.5 KHz / 25 KHz
Maximum Range	3-4 Km in urban environment Up to 10 Km with optimal conditions[4]

COMMUNICATION

Connectors I/O	7-pins Lemo and 5-pins Lemo interfaces. Multifunction cable with USB interface for PC connection
Bluetooth device	V2.0 Class2/V4.1LE
Wi-Fi	802.11 b/g
Web UI	To upgrade the software, manage the status and settings, data download, etc. via smart phone, tablet or other internet enabled electronic device
Reference outputs	RTCM 2.1, 2.3, 3.0, 3.1, 3.2 CMR, CMR+, RTCA
Navigation outputs	GGA, ZDA, GSA, GSV, GST, VTG, RMC, GLL

POWER SUPPLY

Battery	Rechargeable 7.2 V – 6800 mAh Rechargeable 7.2 V – 5200 mAh[5]
Voltage	9 to 18 V DC external power input with over-voltage protection (5 pins Lemo)
Working Time	10 hours 8 hours[5]
Charge Time	Typically 4 hours

PHYSICAL SPECIFICATION

Dimensions	146 mm x 146 mm x 76 mm
Weight	1.2 Kg
Operating Temperature	-30°C to 65°C (-22°F to 149°F) -40°C to 65°C (-40°F to 149°F)[5]
Storage Temperature	-40°C to 80°C (-40°F to 176°F)
Waterproof/Dustproof	IP67. Protected from temporary immersion to depth of 1 meter and from 100% humidity
Shock Resistance	Designed to endure to a 2 m pole drop on concrete floor with no damage
Vibration	Vibration resistant

Specifications are subject to change without notice.

1. Accuracy and reliability are generally subject to satellite geometry (DOPs), multipath, atmospheric conditions and obstructions. In static mode they are subject even to occupation times: the longer is the Baseline, the longer must be the occupation time.
2. Depends on SBAS system performance.
3. Network RTK precision depends on the network performances and are referenced to the closest physical base station.
4. Varies with the operating environment and with electromagnetic pollution.
5. S800 Polar Version.

Appendix 2: Default Radio Configuration

The S800 uses a single UHF radio to cover the different the whole band 410-470 MHz. The frequency and protocol can be easily modified via controller.

Channel number	Frequency (MHz)
1	451.000
2	452.000
3	453.000
4	454.000
5	455.000
6	456.000
7	457.000
8	458.000

Appendix 3: Copyrights, warranty and environmental recycling

Copyrights and trademarks

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STONEX®, the STONEX® logo, and S800 GNSS receiver are trademarks of STONEX® Limited.

STONEX® Assistant, STONEX® GPS Processor and STONEX® Surpad are trademarks of STONEX® Limited.

Bluetooth is a trademark owned by Bluetooth SIG, Inc. and licensed to STONEX®. All other trademarks are the property of their respective owners.

Copyrights, warranty and environmental recycling

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 supersede 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:
  (1) Be free from defects in materials or workmanship for generally 2 years.
        Accessories or specific parts for which different limited warranty period shall apply.
  (2) 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® 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 part or instruments to STONEX® representative office and STONEX® is providing the shipping for return. Dealers need to follow STONEX® repair/service procedure (see appendix 6) to achieve a better and prompt service result.

Return policy Dead On Arrival instruments

All returned products have to be shipped to STONEX® representative office.
The original Purchaser has a period of seven (7) days starting from date of purchasing to signal the existence of a defect in the instrument for a full refund (less shipping and handling), provided the merchandise is in new, resalable condition and returned in the original, undamaged packaging. Customer has to pay for both the return and the original freight fees, regardless of the original freight paid by the Company.
All warranty books, instruction manuals, parts and accessories must be included as well as the original box in which the item was shipped. We recommend to place the original carton inside another box, to avoid any additional damage to the carton itself. In some cases, returns of special items will require a re-stock fee. Acceptance of returned merchandise is final only after inspection by STONEX®.

Above terms and policies shall apply as for hardware. Dealers need to follow STONEX® repair/service procedure (see appendix 4) 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

Two (2) years on STONEX® Products:

GPS receiver

S800 GNSS

Accessories

Accessories & Specific Parts Warranty

For Accessories provided by Stonex® with the instruments S800 GNSS the following general warranty time is for reference:

Batteries	7 months
Battery chargers	7 months
Adapters for battery chargers, Cables, Tribrach, Pole, Antennas	2 years

Service Procedure

Repair/Service procedure for dealers:
(1) S/N of the instrument and a detailed description of the defect (sometimes pictures or video) will be required to indicate the cause and problem.
(2) If dealer wants to repair an instrument under warranty period on their site:
1) If dealers don't have the part in stock they have to send an official order to STONEX® and pay for it and so STONEX® will send the new part to them so they can repair the instrument.
2) When the repair is over, the dealer has to fill the "Spare Part Refund" module and send it to the dedicated mail address.
3) Wait for STONEX®'s authorization SPR no;
4)When dealer receive the SPR authorization no they can send back to STONEX® appointed office the broken part with attached the SPR module;
5) When STONEX® receives the broken part STONEX® shall verify it and if everything is ok the cost of the part shall be refund (refund will be done only after check of the failure part and final approval of STONEX®).
(3) If the instrument needs to be sent back to STONEX® for repair/replacement, dealer/customer has to send to STONEX® a "Returned Merchandise Authorization (RMA)" before they send back the fault instrument. STONEX® shall, at its sole discretion, decide on the place of performance for work under warranty.

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 centres. 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 authorized collection centers 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.
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 interference to 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.

Appendix 4: 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 are 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 uses internal wireless modules or can be connected to an external data communications UHF radio. Regulations regarding the use of the radio-modems 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 Data transceiver

General Antenna Installation Warning

1. All antenna installation and servicing is 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 equipments 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 equipments 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.

Raccomandation 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 are 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:

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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.

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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.

Rechargeable Lithium-ion batteries
These receivers use a rechargeable Lithium-ion battery.

WARNING
- Do not creates damage at the rechargeable Lithium-ion battery.
A damaged battery can cause an explosion, with risk or fire, and can result in personal injury and/or property damage.
To prevent injury or damage:
– Do not use or charge the battery if it appears to be damaged. Signs of damage are discoloration, warping, leaks of liquids.
– Do not expose the battery to fire, high temperature, or direct strong sunlight.
– Do not introduce the battery in water or liquid substance , in general.
– Do not use or store the battery in very hot ambient.
– Do not drop or puncture the battery.
– Do not open the battery and do not put in short-circuit its electrical contacts.

WARNING
- Avoid direct contact with the rechargeable Lithium-ion battery if it appears damage. Battery liquids are corrosive and, and contact with it can result in personal injury or damage to proprieties.
To prevent injury or damage:
– If the battery leaks, avoid contact with the battery fluid.
– If battery fluid gets into your eyes, immediately rinse your eyes with clean water and seek medical attention. Do not rub your eyes!
– If battery fluid gets onto your skin or clothing, immediately use clean water to wash off the battery fluid.