STONEX

STONEX S500

GNSS RECEIVER

User Manual

Contents

1. Interface Description

Figure 1.1: Front view of S500

Figure 1.2: Side view of S500

Figure 1.3: Bottom view of S500

The receiver interface description in the following table.

Num.	Item	Description
1	Connection led indicator	Blue flash when Bluetooth/Wi-Fi connected
2	Data link led indicator	Green flash when differential data transmitting
3	Satellite led indicator	Green flash according to number of stars tracked
4	Battery led indicator	• Green always on when normally operating • Red flash with warning beep when power is less than 10% • Red always on in charging • Green on when charging finished
5	Power button	Button to turn on/off the receiver
6	USB type-C port	Type C port supports USB 2.0, not OTG
7	SIM card slot	For Nano SIM card with push pop mode

2. Operation

2.1 Power on/off, reset, charging

Press and hold the power button for 3 seconds to turn on/off receiver.

Press and hold the power button for 12 seconds to reset the receiver.

Use the standard charger and type-C data cable to charge. The battery led indicator is red in charging and green when charging finished.

2.2 How to connect mobile phone or PC to receiver via Wi-Fi

The name of Stonex GNSS receiver hotspot is the receiver serial number.

After connecting to S500 Wi-Fi, open the browser and type the following IP address: 192.168.10.1.

A window pops up and asks for username and password; the default username and password are “admin” and “password” respectively. Then you can login the web user interface of S500.

2.2.1 What is on Web Interface

In the Position page, you can view the current location information and solution and all the information relative about the current solution processed by S500.

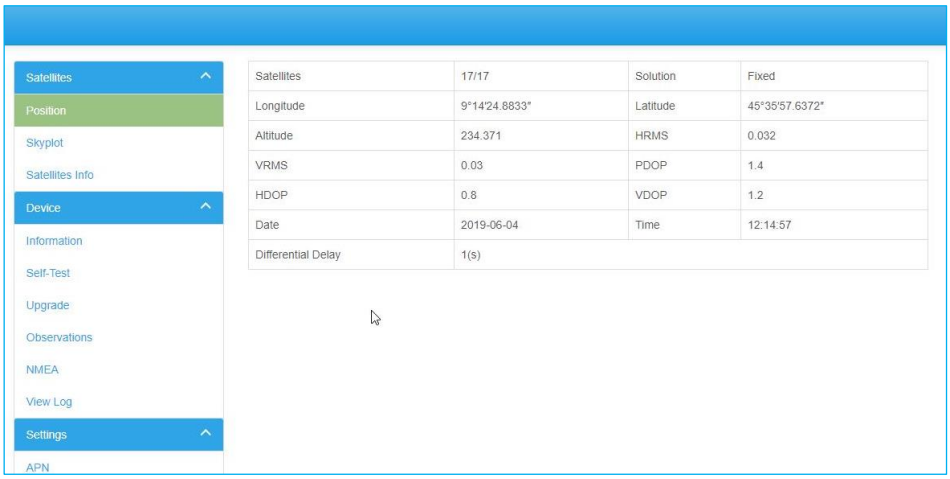

Figure 2.1: Position page

In the Skyplot page, you can view satellite Sky map. The satellite are colored in base of the constellation.

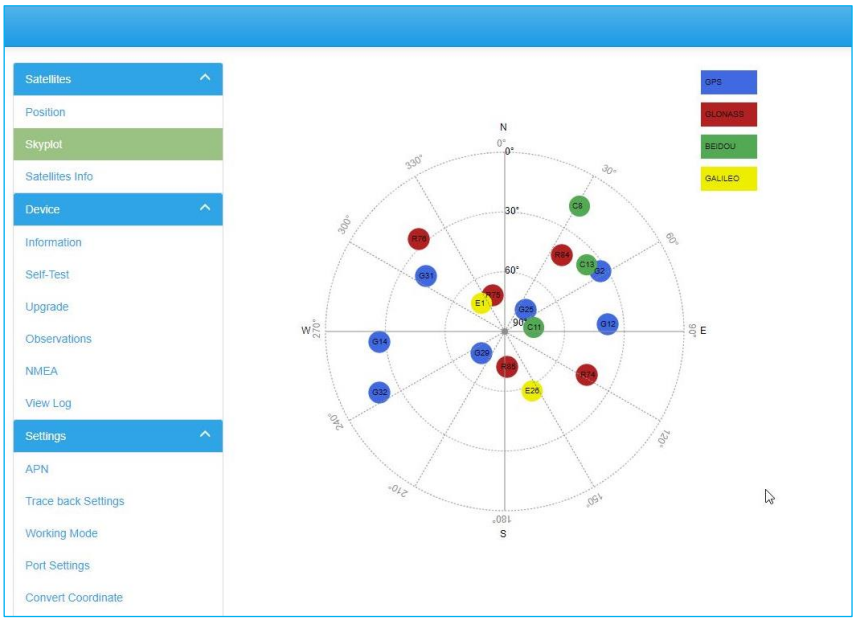

Figure 2.2: Sky plot page

In the Satellites Info page, you can see satellites information. Also inside the Satellite info page, the satellite are scheduled in base of the costellation.

Number	Elevation	Azimuth	L1
G2	33	58	41
G12	38	86	45
G14	26	265	37
G25	75	46	50
G29	74	226	50
G31	42	305	45
G32	19	244	36
R74	43	118	45
R75	71	342	47
R76	27	318	35
R84	42	37	37
R85	72	175	46
E1	72	321	46
E26	57	155	44
C8	17	31	32
C11	74	82	46
C13	37	51	39

Figure 2.3: Satellite information page

In the information page, you can view device info such as firmware version.

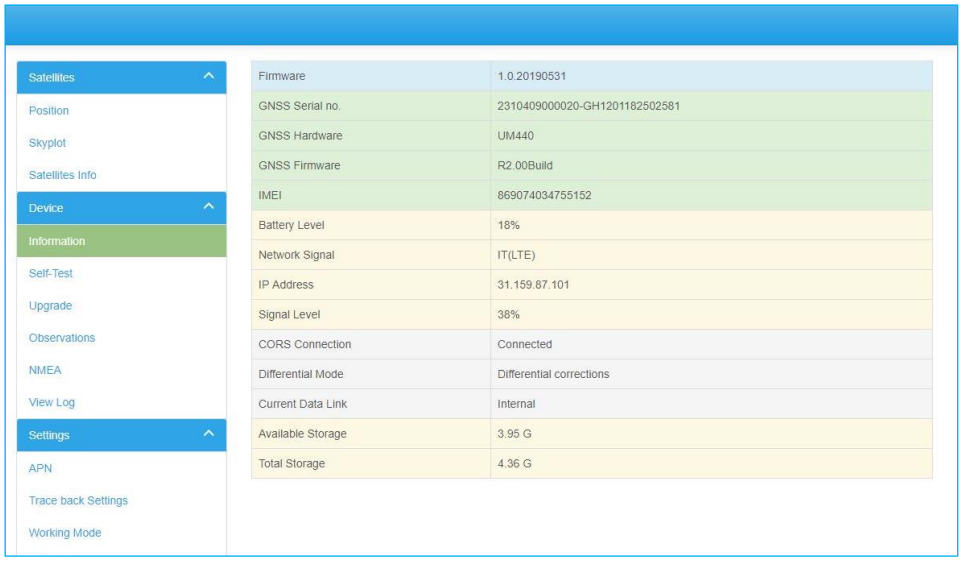

Figure 2.4: General Information Page

In the checking page, you can run the self-test program.

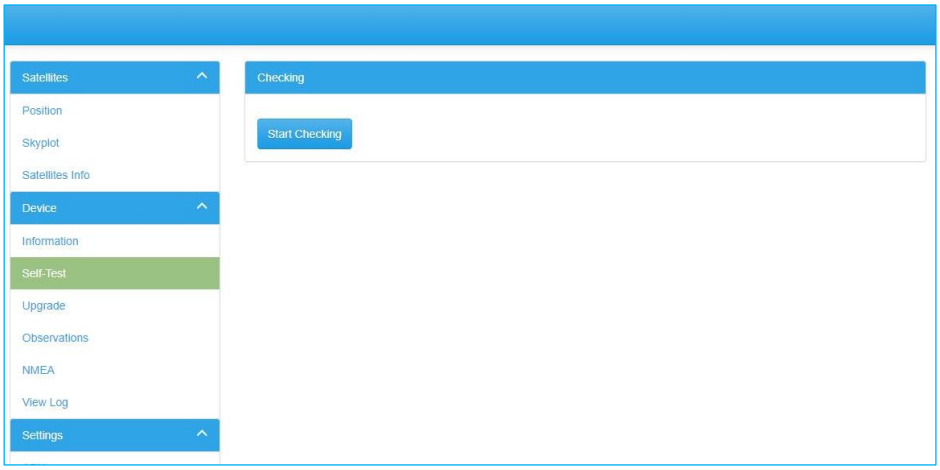

Figure 2.5: Self Check page

In the upgrade online page, you can choose a file to upgrade and do the firmware upgrade of your device. To upgrade your S500 choose the firmware file from your PC and select Upload. Wait until the process is completed.

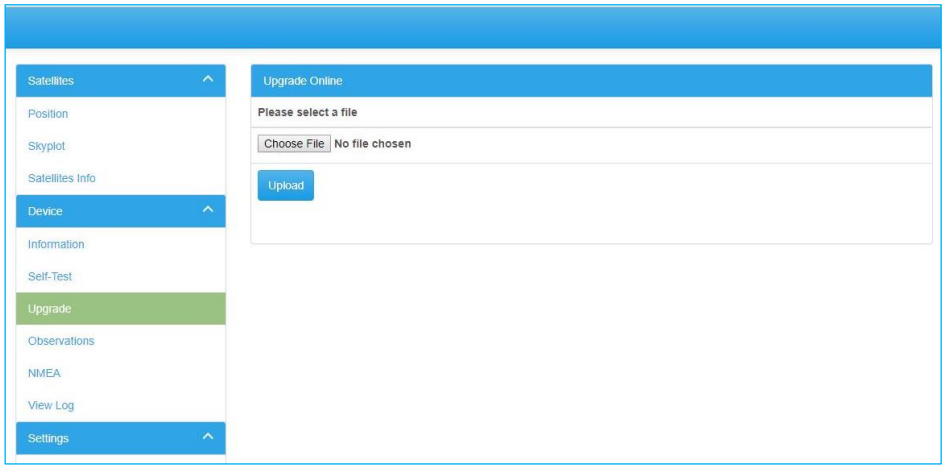

Figure 2.6: Firmware upgrade page

In the observation page, you can download observation files. Download the raw data stored inside the S500 on your PC and then use them in operation as Post Process Job.

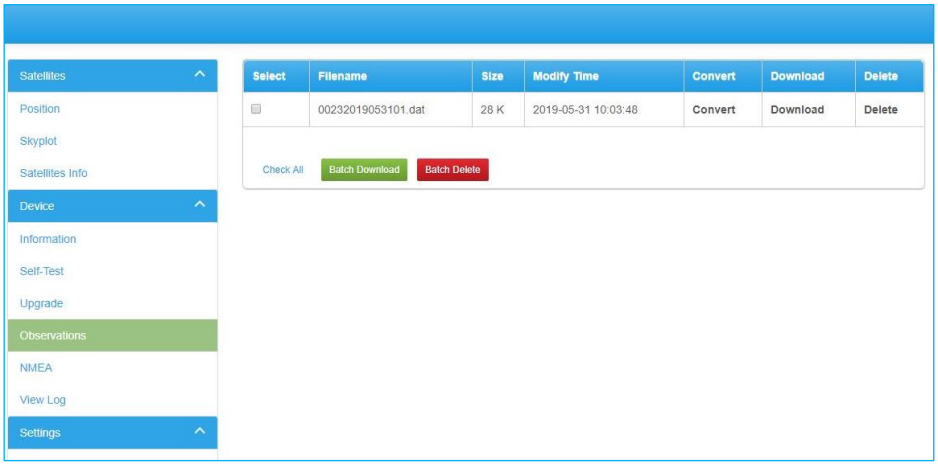

Figure 2.7: Raw data Page

In the NMEA page, you can download NMEA files.

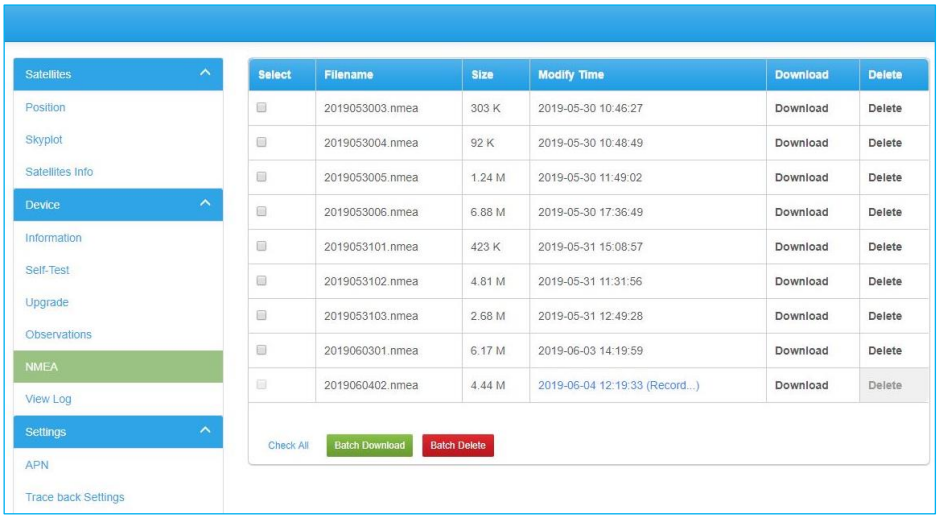

Figure 2.8: Nmea Files Page

In the view log page, you can download, and view device run log.

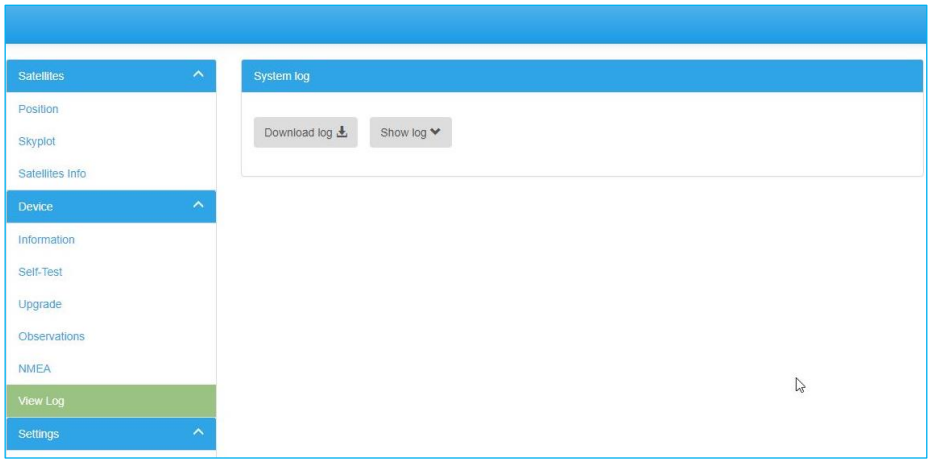

Figure 2.9: Log Page

In the working mode page, you can set system mode, datalink and other device settings.

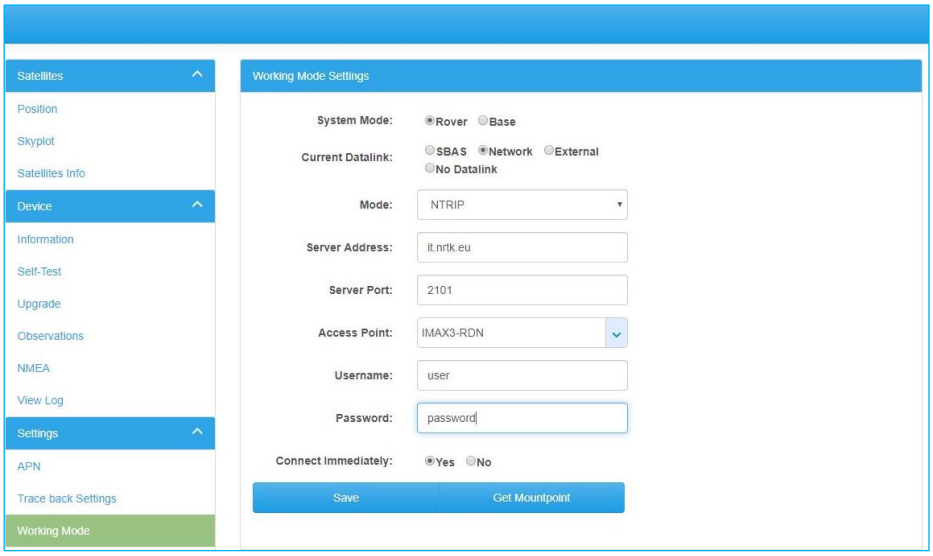

Figure 2.10: Working mode page

Inside working mode page is possible set the Observation settings to start or Stop the Raw Data Log session.

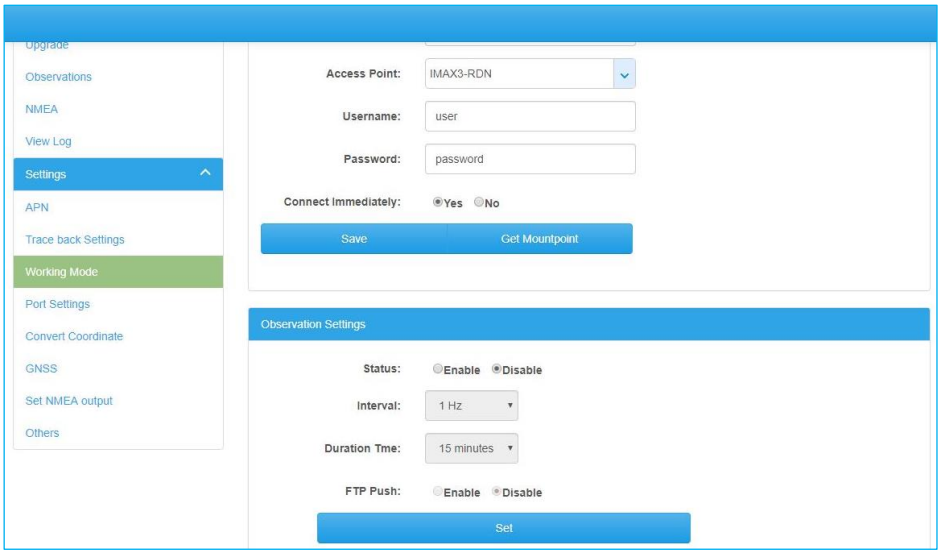

Figure 2.11: Working mode page

In the set NMEA output page, you can set NMEA statement and output frequency.

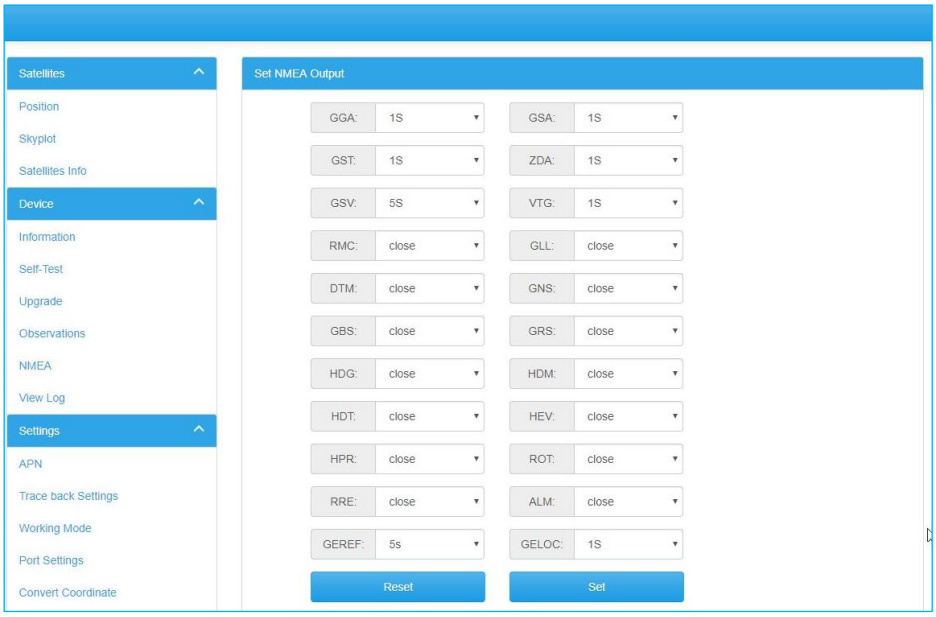

Figure 2.12: Set NMEA page

2.3 How to connect the handheld to receiver via Bluetooth

Make sure that the app Cube-Connector is installed on your handheld; open it, search your S500 with its serial number and connect S500 via Bluetooth.

Handheld will search Bluetooth devices; find target S500 serial number and press “Connect”.

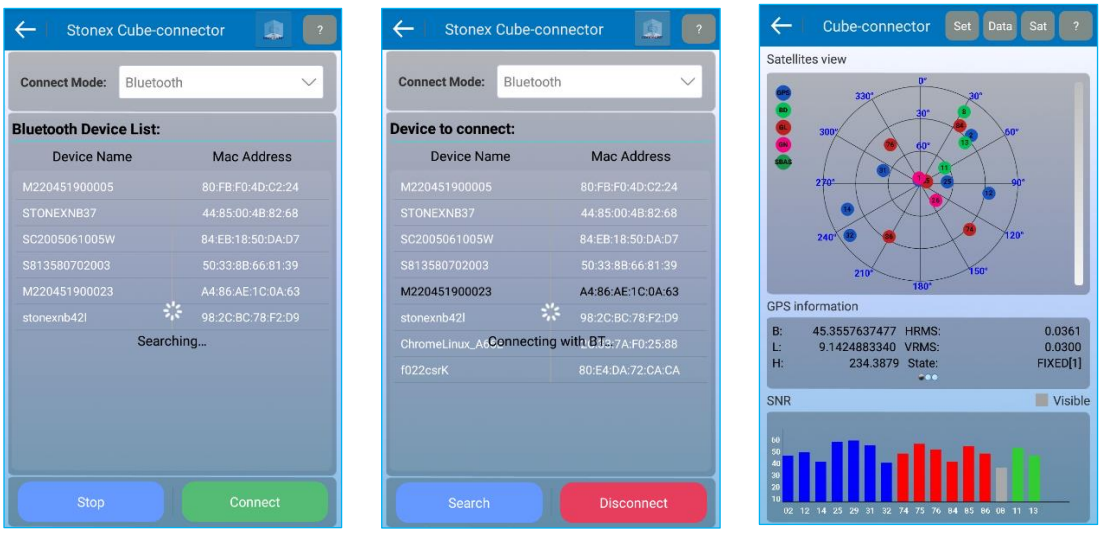

Figure 2.13: Stonex Cube Connector visualization

3. Care and Transport

3.1 Equipment care

Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to “Technical Features” for information about temperature limits.

3.2 Build in Battery Care

Your product is powered by a rechargeable battery. The full performance of a new battery is achieved only after two or three complete charge and discharge cycles. The battery can be charged and discharged hundreds of times but will eventually wear out.

Do leave a fully charged battery connected to a charger, since overcharging may shorten its lifetime.

If left unused, a fully charged battery will lose its charge over time.

3.3 Charger Care

Do not attempt to charge/power your product with other than the charger provided. The use of any other types may damage or destroy the product and could be dangerous. Use of other chargers may invalidate any approval or warranty.

For availability of approved enhancements, please check with your dealer.

Charge/power the product according to the instructions supplied with the product.

3.4 Maintenance

Unplug the product or charger before cleaning. Cleaning the product by wiping with a dry or slightly damp cloth.

The cord and charger may only be dry dusted.

3.5 Transport

When transporting the product by rail, air or sea, always use the complete original STONEX packaging, transport container and cardboard box, or its equivalent, to protect against shock and vibration.

Never carry the product loose in a road vehicle, as it can be affected by shock and vibration.

Always carry the product in its transport container, original packaging or equivalent and secure it. When transporting or shipping batteries, the person responsible for the product must ensure that the applicable national and international rules and regulations are observed. Before transportation or shipping, contact your local passenger or freight transport company.

4. Warning and declaration

4.1 FCC warning statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: this device may not cause harmful interference, and this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference. 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.

4.2 FCC RF warning statement

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

5. S500 Technical Features

RECEIVER

Satellite Tracked	GPS: L1
	GLONASS: L1
	BEIDOU: B1
	GALILEO: E1
	SBAS: L1
Channels	432
Position Rate	Up to 20 Hz
Signal Reacquisition	< 1 sec
RTK Initialization	Typically > 120 sec
Hot Start	Typically < 15 sec
Initialization Reliability	> 99.9 %

POSITIONING[1]

POST PROCESSING	1 cm
DGPS	<50 cm
RTK[2]	3 cm

INTEGRATED GNSS ANTENNA

Four constellation antenna

HARDWARE

Processor	SC20
RAM	512 MB
Flash Memory	8 GB
Operating System	Android

INTERNAL MODEM

Band	GSM/GPRS/EDGE WCDMA/LTE

COMMUNICATION

I/O Connectors	TYP C connector support USB 2.0
Bluetooth	4.0, 2.4 GHz
Wi-Fi	802.11 g
Differential	RTCM 2.x, 3.x CMR

POWER SUPPLY

Battery	Rechargeable 3.8 V – 6.000 mAh
Working Time	Up to 10 hours (Post Processing) Up to 8 hours (RTK with GSM)
Charge Time	Typically 6 hours

PHYSICAL SPECIFICATION

Dimensions	136 mm x 78 mm x 31 mm
Weight	350 gr
Operating Temperature	-30°C to 65°C (-22°F to 149°F)
Storage Temperature	-40°C to 80°C (-40°F to 176°F)
Waterproof/Dustproof	IP67
Shock Resistance	Designed to endure to a 1.2 m pole drop on concrete floor with no damage

STANDARD ACCESSORIES

USB cable, Belt Case

OPTIONAL ACCESSORIES

Carbon fiber pole, Telescopic pole, Bracket 5/8", Soft Case

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. Network RTK precision depends on the network performances and are referenced to the closest physical base station.

6. S500 Bundle

6.1 Standard Configuration

S500 standard bundle is composed with the receiver, the 4 adaptor plugs to compose the battery charger in base on the country, two USB cable (1 Type C-Type C and 1 Type C-Type A), a cloth bag to use the S500 without a pole and a carton box.

DESCRIPTION	Q.TY
S500 GNSS L1, 432Ch, 4G, WIFI, BT - Bundle	1
Power Adaptor with 4 plugs(US, UK, EU and AU)	1
TypeC-TypeC, 1.5m	1
TypeC-TypeA, 1.5m	1
Cloth bag for S500, black	1
Carton box	1

Figure 6.1: Standard bundle configuration

Figure 6.2: S500 Carton Box

6.2 Optional Accessory

S500 has some optional accessory. To use the S500 mounted on a pole it's necessary the apposite adaptor. This allow the user to use S500 in vertical and have a precise and stable support.

DESCRIPTION	Q.TY
S500 – Pole Mount	1
Softbag	1
Telescopic Carbon fiber pole 2.2 m	1

Figure 6.3: S500 Accessory

Appendix 1: Copyrights, warranty and environmental recycling

Copyrights and trademarks

STONEX®, the STONEX® logo, and S500 GNSS receiver are trademarks of STONEX® Limited.

STONEX® Cube-Connector, STONEX® GPS Processor are trademarks of STONEX® Limited.

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

Release Notice

This is the June 2019 release of the STONEX® S500 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 2019

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.

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 placing 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 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: S500 GNSS Series.

Accessories

Accessories & Specific Parts Warranty

For Accessories provided by Stonex with the instruments S500 GNSS the following general warranty time is for reference:

- Battery charger: 7 months.
- Adapters for battery charger, Cables, Pole: 2 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.

STONEX® SRL

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