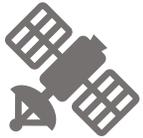


# SC650 GNSS Receiver CORS and Monitoring



# SC650 – Main features



## Multiconstellation:

It is designed to leverage the power of multiple satellite constellations, providing users with exceptional positioning accuracy and reliability.



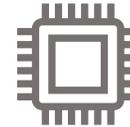
## Numerous Connections:

It features numerous connection ports, including DB9 9pin, Ethernet, and a M12 connector, offering unparalleled flexibility.



## Dual frequency radio:

It features a built-in radio that operates on the 410-470 MHz and 902.4-928 MHz frequency bands, enabling seamless communication and data transfer.



## Two versions:

They have different performance capabilities and adapt to cater to a wide variety of distinct user needs and usage scenarios.



# SC650 - Applications

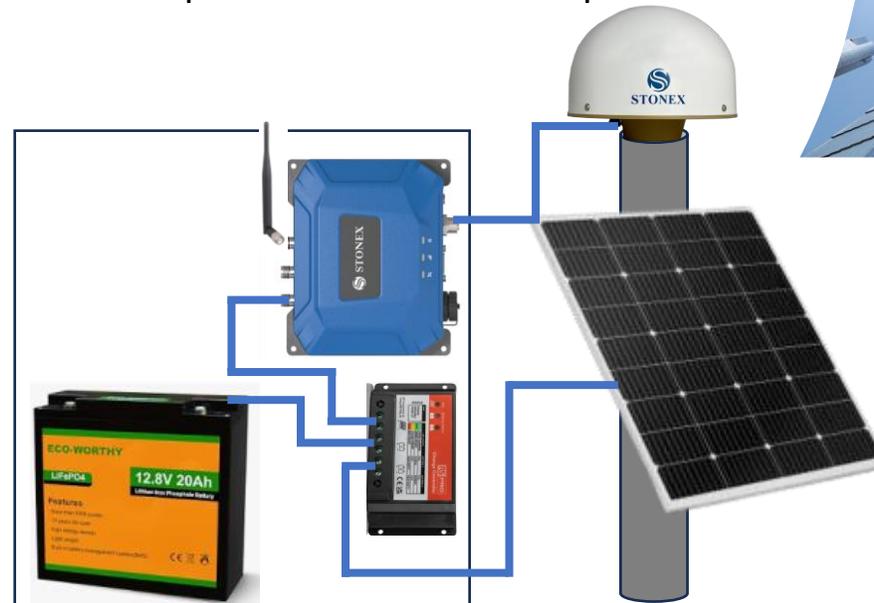
## Monitoring

- Landslides: Monitoring ground movements to prevent and mitigate landslides.
- Dams: Checking structural stability and detecting any deformations.
- Infrastructures: Surveillance of buildings and other structures to ensure their safety.
- Bridges: Monitoring vibrations and movements to prevent structural collapses



## Solution

- Box having inside:
  - **SC650** Receiver
  - 20Ah Battery
  - Charge controller
- SA1100 Antenna
- 100 W solar panel



# SC650 - Applications

## CORS Network

- Position Monitoring and Calibration
- Differential Correction Generation
- Support for High-Precision Applications

## Typical solution

- Receiver: SC2200
- Antenna: SA1500



## Valid alternative

- Receiver: **SC650**
- Antenna: SA1500
- Uninterruptible Power Supply (UPS)



# SC650 - Applications

## RTK Base

SC650 can be used as a BASE receiver to **transmit RTK corrections** to a ROVER GNSS via the internal UHF radio in the 400 MHz or 900 MHz frequencies.

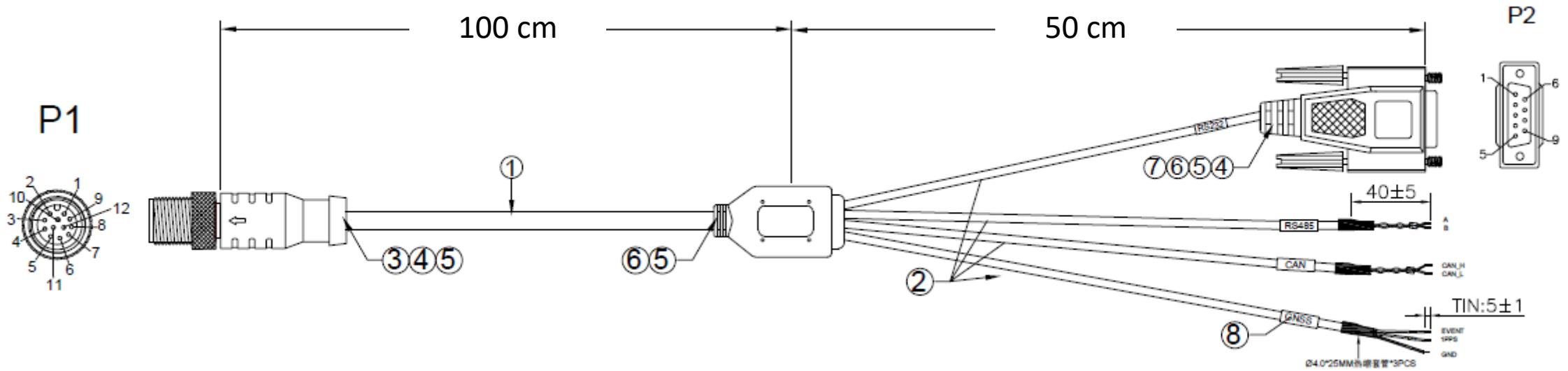
The SC650 receiver can be fixed on a tripod and connected to the SA85 external GNSS antenna via the coaxial cable, powered by the EB-9000 external battery.

The configuration of the base will be done through the web user interface of the receiver.



# SC650 - M12 cable

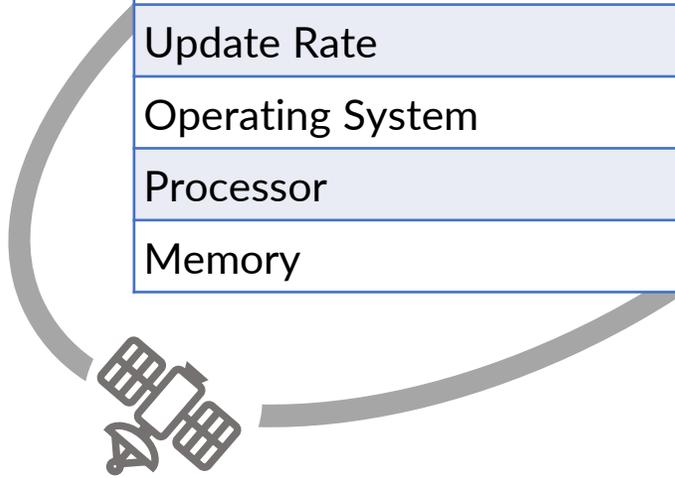
To connect the SC650 to other devices and sensors, an optional M12 multi-port cable is available, which features the following connections: RS232, RS485, CAN, EVENT, 1pps.



# Technical Specification

# SC650 - Technical Specification

Receiver		
	SC650 (U)	SC650 (S)
Board	UniStrong	Septentrio
Channels	1100+	440+
Tracking	GPS: L1C/A, L1C, L1P, L2C, L2P, L5 GLONASS: L1, L2, L3 BEIDOU: B1I, B2I, B3I, B1C, B2a, B2b, ACEBOC GALILEO: E1, E5a, E5b, E6, ALTBOC QZSS: L1C/A, L2C, L5 IRNSS: L5 SBAS	GPS: L1C/A, L1P, L2C, L2P, L5 GLONASS: L1, L2, L3 BEIDOU: B1I, B2I, B3I, B1C, B2a, B2b GALILEO: E1, E5a, E5b, E6, ALTBOC QZSS: L1C/A, L2C, L5 IRNSS: L5 SBAS
Update Rate	20 Hz	100 Hz
Operating System	Linux	
Processor	A7 platform	
Memory	32 GB internal storage	



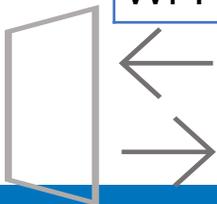
# SC650 - Technical Specification

Positioning		
	SC650 (U)	SC650 (S)
High precision static survey	H 2.5 mm + 1 ppm RMS V 5 mm + 1 ppm RMS	
RTK (< 30 Km)	H 8 mm + 1 ppm RMS V 15 mm + 1 ppm RMS	H 6 mm + 1 ppm RMS V 10 mm + 1 ppm RMS
PPP Accuracy	< 20 cm	n/a
SBAS Accuracy	< 60 cm	



# SC650 - Technical Specification

Communication		
	SC650 (U)	SC650 (S)
I/O Connectors	Power input: Lemo-0 female, 2 pin DB9 9pin: <ul style="list-style-type: none"><li>➤ RS232_RXD (Port receives the data)</li><li>➤ RS232_TXD (Port sends the data)</li><li>➤ RS232_RTS (Request send data)</li><li>➤ RS232_CTS (Allow send data)</li></ul> RJ45 M12 (RS232, RS485, CAN, EVENT, 1pps) LTE TNC UHF/LoRa (Optional) TNC GNSS external antenna TNC	
Bluetooth	BT 5.0 EDR, LE	
Wi-Fi	802.11b/g	



# SC650 - Technical Specification

Internal radio		
	SC650 (U)	SC650 (S)
Type	Tx - Rx	
Frequency range	410 - 470 MHz 902.4 - 928 MHz	
Channel spacing	12.5 KHz / 25 KHz	
Transmission power	1 W	
Maximum range	3-4 Km in urban environment Up to 10 Km with optimal conditions	



# SC650 - Technical Specification

Internal modem		
	SC650 (U)	SC650 (S)
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	



# S650 - Technical Specification

## Physical Specification

	SC650 (U)	SC650 (S)
Weight	570 g	
Dimensions	158 mm x 142 mm x 43 mm	
Operating Temperature	-40°C to 80°C (-40°F to 176°F)	
Storage Temperature	-45°C to 85°C (-49°F to 185°F)	
Protection Class	IP68	
Humidity	100% non-condensing	
Drop	Designed to endure to a 1.5 m drop on concrete floor with no damage	



# S650 - Panel definition



Indicators	1 Satellite indicator	Green: Fixed solution Flash each 1s: Single solution/ Float solution/ Differential solution Red: Invalid solution
	2 GSM-4G indicator	Red light when the device is powered on, green light indicates the network connection is normal
	3 Datalink indicator	Green light indicates the device is transmitting differential data Red light indicates the cable is receiving differential data.

# SC650 - Connector definition



1 2 3 4



5 6 7



8

N.	Name	Definition
1	LAN	RJ45
2	COM1	DB9 9pin: <ul style="list-style-type: none"> <li>➤ RS232_RXD: Port receives the data</li> <li>➤ RS232_TXD: Port sends the data</li> <li>➤ RS232_RTS: Request send data</li> <li>➤ RS232_CTS: Allow send data</li> </ul>
3	M12	RS232+RS485+CAN+EVENT+1pps
4	Power	Lemo-0 female, 2 pin, power input
5	LTE	TNC, 4G antenna interface
6	UHF/LoRa (Optional)	TNC
7	GNSS	TNC for external GNSS antenna
8	SIM/TF	TF and SIM card slot

# Marketing

# SC650 - Product pictures

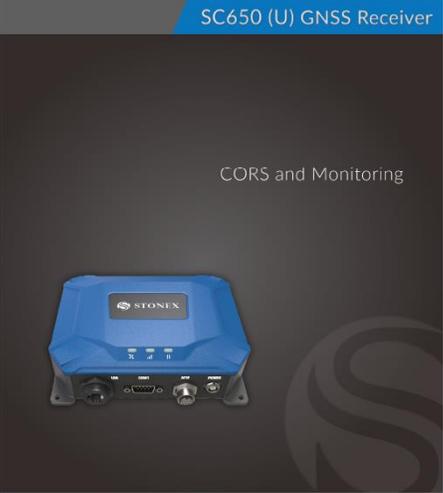


# SC650 - Brochure



## SC650 (U) TECHNICAL FEATURES

### SC650 (U) GNSS Receiver



CORS and Monitoring

RECEIVER	GPS L1C/A, L1P, L1X, L2P, L5 GLONASS L1, L2, L3 BEIDOU B1I, B2I, B3I, B2C, B2a, B2b Galileo E1, E5a, E5b, E6, ALTBOC QZSS L1C/A, L1X, L5 IRNSS L5	USER INTERFACE	LEDs
Channels	1550 <sup>1</sup>	Operating System	Linux
Position Rate	20 Hz	Processor	A7 platform
Signal Reception	< 1 s	COMMUNICATION	
Cold Start	< 60 s	Power Input	Lenovo female, 2 pin D9P type
Hot Start	< 60 s	RS232_RXD (Port receives the data)	
Internal Memory	32 GB storage	RS232_TXD (Port sends the data)	
External Memory	TF card supported	RS232_RTS (Request send data)	
Multipath and interference mitigation technology	Yes	RS232_CTS (Allow send data)	
POSITIONING <sup>2</sup>		Bluetooth	BT 5.0 EDR, LE
HIGH PRECISION STATIC SURVEYING		WiFi	802.11n
Horizontal	2.5 mm + 1 ppm RMS	Web UI	To upgrade the software, manage the status and settings, and download data, use a smartphone, tablet, or other internet-enabled electronic device.
Vertical	3 mm + 1 ppm RMS	Reference outputs	Raw data, RTCM2/3, RTCM2/3+V2.3, Snow XDRM2, I1, etc.
RTK (< 30 km <sup>3</sup> )	8 mm + 1 ppm RMS	Navigation outputs	NMEA 0183
Fixed RTK Horizontal	8 mm + 1 ppm RMS	NETWORKING SERVICES	
Fixed RTK Vertical	15 mm + 1 ppm RMS	NTRIP	Center/Server/Client
PPP Accuracy	< 20 cm RMS	Remote Management	By Stonex Software
SBAS Accuracy	< 60 cm RMS	FTP server	For data download and other warning messages
INTERNAL MODEM		Email alerts	Support
LTE FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B21/B26/B28	TFTP server	Support
Band	LTE TDD: B38/B39/B40/B41 UMTS: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8	Others	DDNS, VPN, SNMP, Firewall
INTERNAL RADIO		POWER SUPPLY	
Type	Tx: 30 W	Voltage	10-28V DC wide voltage
Frequency Range	450 - 470 MHz	Power consumption	3.5 - 4.8W
Channel Spacing	95K4 - 120 MHz	PHYSICAL SPECIFICATION	
Maximum Range <sup>4</sup>	3.4 Km in urban environment Up to 10 Km with optional conditions	Dimensions	158 mm x 142 mm x 43 mm
		Weight	370 g
		Operating Temperature	-40°C to 80°C (-40°F to 176°F)
		Storage Temperature	-40°C to 80°C (-40°F to 176°F)
		Waterproof/ Dustproof	IP68
		Shock Resistance	Designed to endure to 1.5 m drop on concrete floor with no damage
		Humidity	100% non-condensing



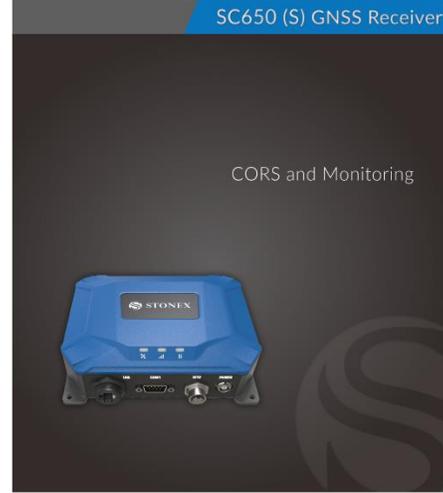
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Phone: +39 02 75419201  
www.stonex.it | info@stonex.it



## SC650 (S) TECHNICAL FEATURES

### SC650 (S) GNSS Receiver



CORS and Monitoring

RECEIVER	GPS L1C/A, L1P, L1X, L2P, L5 GLONASS L1, L2, L3 BEIDOU B1I, B2I, B3I, B2C, B2a, B2b Galileo E1, E5a, E5b, E6, ALTBOC QZSS L1C/A, L1X, L5 IRNSS L5	USER INTERFACE	LEDs
Channels	1550 <sup>1</sup>	Operating System	Linux
Position Rate	20 Hz	Processor	A7 platform
Signal Reception	< 1 s	COMMUNICATION	
Cold Start	< 60 s	Power Input	Lenovo female, 2 pin D9P type
Hot Start	< 60 s	RS232_RXD (Port receives the data)	
Internal Memory	32 GB storage	RS232_TXD (Port sends the data)	
External Memory	TF card supported	RS232_RTS (Request send data)	
Multipath and interference mitigation technology	Yes	RS232_CTS (Allow send data)	
POSITIONING <sup>2</sup>		Bluetooth	BT 5.0 EDR, LE
HIGH PRECISION STATIC SURVEYING		WiFi	802.11n
Horizontal	2.5 mm + 1 ppm RMS	Web UI	To upgrade the software, manage the status and settings, and download data, use a smartphone, tablet, or other internet-enabled electronic device.
Vertical	3 mm + 1 ppm RMS	Reference outputs	Raw data, RTCM2/3, RTCM2/3+V2.3, Snow XDRM2, I1, etc.
RTK (< 30 km <sup>3</sup> )	8 mm + 1 ppm RMS	Navigation outputs	NMEA 0183
Fixed RTK Horizontal	8 mm + 1 ppm RMS	NETWORKING SERVICES	
Fixed RTK Vertical	15 mm + 1 ppm RMS	NTRIP	Center/Server/Client
SBAS Accuracy	< 60 cm RMS	Remote Management	By Stonex Software
INTERNAL MODEM		FTP server	For data download and other warning messages
LTE FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B21/B26/B28	Email alerts	Support
Band	LTE TDD: B38/B39/B40/B41 UMTS: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8	TFTP server	Support
INTERNAL RADIO		Others	DDNS, VPN, SNMP, Firewall
Type	Tx: 30 W	POWER SUPPLY	
Frequency Range	450 - 470 MHz	Voltage	10-28V DC wide voltage
Channel Spacing	95K4 - 120 MHz	Power consumption	3.5 - 4.8W
Maximum Range <sup>4</sup>	3.4 Km in urban environment Up to 10 Km with optional conditions	PHYSICAL SPECIFICATION	
		Dimensions	158 mm x 142 mm x 43 mm
		Weight	370 g
		Operating Temperature	-40°C to 80°C (-40°F to 176°F)
		Storage Temperature	-40°C to 80°C (-40°F to 176°F)
		Waterproof/ Dustproof	IP68
		Shock Resistance	Designed to endure to 1.5 m drop on concrete floor with no damage
		Humidity	100% non-condensing



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# Configuration

# SC650 (U) - Standard Configuration

PRODUCT CODE	DESCRIPTION
B10-150616	SC650, CORS, 1100+Ch, 4G, UHF Dual, 20Hz <b>1</b>
	CORS, Power cable, 2pin +/- voltage <b>2</b>
	AR-29, UHF antenna, TNC, 29cm <b>3</b>
	Carton Box for SC650 <b>4</b>
30-350111	AG-17, GSM antenna, 17cm <b>5</b>



**1**



**2**



**3**



**5**



**4**

# SC650 (S) - Standard Configuration

PRODUCT CODE	DESCRIPTION
B10-150617	SC650, CORS, 440+Ch, 4G, UHF Dual, 100Hz <b>1</b>
	CORS, Power cable, 2pin +/- voltage <b>2</b>
	AR-29, UHF antenna, TNC, 29cm <b>3</b>
	Carton Box for SC650 <b>4</b>
30-350111	AG-17, GSM antenna, 17cm <b>5</b>



**1**



**2**



**3**



**5**



**4**

## SC650 - Optional main accessories

PRODUCT CODE	DESCRIPTION
30-350260	CORS, Power cable, 2pin I/O 220V/15V, 3 plugs (US, UK and EU)
30-350298	CORS, Power cable, 2pin +/- voltage
30-350423	SC650, M12 cable, Multiport, 150cm
30-350112	AR-29, UHF antenna, TNC, 29cm
30-357138	SA85, Antenna GNSS, Geodetic
30-357139	SA1100, Antenna GNSS, Mini choke ring
30-350387	AC-02M, GNSS antenna cable, 2m
30-350316	AC-08M, GNSS antenna cable, 8m
30-357126	AC-30M, GNSS antenna cable, 30m





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