Hemisphere®

S321+
GNSS Smart Antenna

MULTI-FREQUENCY, MULTI-GNSS SMART ANTENNA

atlas®

The S321+ is Hemisphere's all-new multi-GNSS, multi-frequency smart antenna. The S321+ provides robust performance and high precision in a compact and rugged package. With multiple wireless communication ports and an open GNSS interface, the S321+ can be used in a variety of operating modes. Use the S321+ as a precise base station sending RTK to your existing rover network. Turn S321+ into a lightweight and easy to use rover by connecting it to your base via UHF radio or Wi-Fi network. The built- in web user interface (WebUI) can be used to control and manage the receiver status and operation, as well as to upgrade the S321+ with new firmware and activations. S321+ is Athena-enabled and Atlas-capable (subscription required).

The S321+ receiver is powered by Athena RTK technology. With Athena, S321+ provides state-of-the-art RTK performance when receiving corrections from a static base station or network RTK correction system. With multiple connectivity options, the S321+ allows for RTK corrections to be received over radio, cell modem, Wi-Fi, Bluetooth, or serial connection. S321+ delivers centimeter-level accuracy with virtually instantaneous initialization times and cutting-edge robustness in challenging environments.

The S321+ receiver also enables users to work with Atlas. Atlas is Hemisphere's industry-leading global correction service, which can be added as a subscription to the S321+. Atlas delivers world-wide centimeter-level correction data over L-band communication satellites. With Atlas, S321+ users are able to experience sub-decimeter positioning performance anywhere on earth, without the need to be near a GNSS or communication infrastructure.

Key Features

- Multi-Frequency, Multi-GNSS (GPS, GLONASS, BeiDou, Galileo, QZSS)
- Athena™ RTK engine and Atlas® L-band global corrections
- Dual hot-swappable lithium batteries provide 12 hours of battery life
- Wi-Fi, UHF, Cellular, and Bluetooth wireless communication
- Powerful WebUI control accessed via Wi-Fi
- 8 GB internal memory for data logging, download, and upload
- Internal tilt sensor corrects the collected point coordinates, to a maximum inclination of 15°, in accordance with the tilt angle and direction of the range pole [5, 6]

GNSS Receiver Specifications

Receiver Type:	Multi-Frequency GNSS
Signals Received:	RTK, L-band, DGNSS, SBAS, Autonomous
Channels:	572 / 488
RTK Formats:	RTCM3, ROX, CMR, CMR+ [4]
L-Band Formats:	Atlas H100, Atlas H30, Atlas H10
Update Rate/ Recording Intervals:	Selectable from 1, 2, 4, 5, 10 Hz (20 Hz available)

Accuracy

Positioning:	**RMS (67%)**	**2DRMS (95%)**
Autonomous, no SA: [1]	1.2 m	2.4 m
SBAS: [1]	0.3 m	0.6 m
Atlas: [1,3]	0.08 m	0.16 m
RTK: [1,2]	8 mm + 1 ppm	15 mm + 1 ppm
Static Performance (Long Occupation): [1]	3 mm + 0.1 ppm	3.5 mm + 0.4 ppm
Static Performance (Rapid Occupation): [1]	3 mm + 0.5 ppm	5 mm + 0.5 ppm

Satellite Tracking

GPS:	L1CA, L1P, L2P, L2C, L5
GLONASS:	G1, G2, P1, P2
BeiDou:	B1, B2
QZSS:	L1C, L1CA, L2C, L5
Galileo:	E1BC, E5a, E5b
SBAS:	MSAS, WAAS, EGNOS, GAGAN

Communications

Connectors I/O:	5-pin Lemo connector for external power supply, Serial communication, and external radio devices 7-pin Lemo connector for USB OTG connection and troubleshooting 1 SMA antenna connector for internal radio 1 SMA antenna connector for modem module
WebUI:	To upgrade the software, manage the status and settings, data download, via smart phone, tablet or other electronic device, configure advanced radio settings
TTS:	Smart voice broadcast system "Speaking" receiver
Reference Outputs:	RTCM2.1, RTCM2.3, RTCM3.0, RTCM3.1, RTCM3.2 including MSM

Radio

Frequency Range:	410 - 470 MHz
Channel Spacing:	12.5KHz / 25 KHz
Transmitting Power:	0.5 /1 W
Operating Range:	3 - 5 km typical/10 km optimal (Depends on terrain and operating environment)

Wireless Module

Wi-Fi:	Integrated module with internal Wi-Fi antenna
Bluetooth:	Bluetooth 2.1 + EDR Integrated Bluetooth (BT) communication module with internal BT antenna

Communications

PLS8-E (International):	**4G-** Penta Band LTE - 800/900/1800/2100/2600 MHz - FDD-Band (20, 8, 3, 7, 1) **3G-** Tri Band UMTS (WCDMA) - 900/1800/2100 MHz - FDD-Band (8, 3, 1) **2G-** Dual Band GSM/GPRS/EDGE - 900/1800 MHz
PLS8-X (North America):	**4G-** Penta Band LTE - 700/700/850/AWS (1700/2100)/1900 MHz - FDD-Band (13, 17, 5, 4, 2) **3G-** Tri Band UMTS (WCDMA) - 850/AWS (1700/2100)/1900 MHz - FDD-Band (5, 4, 2) **2G-** Quad Band GSM/GPRS/EDGE - 850/900/1800/1900 MHz

Power

Battery:	Hot-swappable 11.1 V - 37.74 Wh intelligent lithium (2 per kit)
Battery life:	12 hour operation from two batteries with UHF radio in Rx mode
Voltage:	9 to 22V DC external power input with over- voltage protection (5-pin Lemo)
Charge Time:	Typically 7 hours

Memory

SIM Card:	User accessible SIM card slot
Memory:	Internal 8 GB, accessible through USB and Wi-Fi
SD Card:	External Micro SD card slot, supports up to 64 GB

Environmental

Operating Temperature:	-30°C to 60°C (-22°F to 140°F)
Storage Temperature:	-40°C to 80°C (-40°F to 176°F)
Waterproof/ Dustproof:	IP67. Protected from temporary immersion to a depth of 1 meter
Shock Resistance:	MIL-STD-810G, method 516.6 Designed to survive a 2 m pole drop on concrete floor Designed to survive a 1 m free drop on hardwood floor
Vibration:	MIL-STD-810G, method 514.6E-I
Humidity:	Up to 100%
Inflammability:	UL recognized, 94HB Flame Class Rating (3) 1.49 mm
Chemical Resistance:	Cleaning agents, soapy water, industrial alcohol, water vapor, solar radiation (UV)

Aiding Devices

Size:	14.6 D x 14.8 H (cm) 5.75 D x 5.83 H (in)
Weight:	<1.38 kgs (<3.05 lbs)
Mounting:	5/8"x11, 55° thread angle, stainless steel insert
Phase Center Offset:	GPS L1 and L2 offset below 2.5mm

1. Depends on multipath environment, number of satellites in view, satellite geometry, and ionospheric activity
2. Depends also on baseline length
3. Requires a subscription from Hemisphere GNSS
4. CMR and CMR+ do not cover proprietary messages outside of the typical standard
5. Magnetic interference impacts performance
6. Requires support of third party survey software

Hemisphere GNSS
8515 E. Anderson Drive
Scottsdale, AZ 85255, USA

Phone: +1 (480) 348-6380
Toll-Free: +1 (855) 203-1770
Fax: +1 (480) 270-5070

precision@hgnss.com
www.hgnss.com

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