

# S321+ GNSS Smart Antenna

## Surveyor Tough

### 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**



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.

Atlas L-band has the following benefits:

- **Positioning accuracy** - Competitive positioning accuracies down to 2 cm RMS in certain applications.
- **Positioning sustainability** - Advanced position quality maintenance in the absence of correction signals, using Hemisphere's patented technology.

For more information about Athena RTK, see: <http://hemispheregnss.com/Technology>



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## GNSS Receiver

Receiver Type:	Multi-Frequency GNSS
Positioning Modes:	RTK, L-band, DGNSS, SBAS, Autonomous
Channels:	394
RTK Formats:	RTCM3, ROX, CMR, CMR+ <sup>4</sup>
L-Band Formats:	Atlas H100, Atlas H30, Atlas H10
Update Rate/ Recording Interval:	Selectable from 1, 2, 4, 5, 10 Hz (20 Hz available)

## 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

## Performance

RTK: <sup>1,2</sup>	Horizontal 8 mm + 1 ppm	Vertical 15 mm + 1 ppm
Static Performance (long occupation):	3 mm + 0.1 ppm	3.5 mm + 0.4 ppm
Static Performance (rapid occupation):	3 mm + 0.5 ppm	5 mm + 0.5 ppm
L-Band Performance: <sup>1,3</sup>	0.08 m	0.16 m
SBAS (WAAS): <sup>1</sup>	0.3 m	0.6 m
Autonomous, no SA: <sup>1</sup>	1.2 m	2.4 m

## Communication

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
Emitting 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

## Cellular

PLS8-E (International):	<b>4G</b> - Penta Band LTE - 800/900/1800/2100/2600 MHz - FDD-Band (20, 8, 3, 7, 1) <b>3G</b> - Tri Band UMTS (WCDMA) - 900/1800/2100 MHz - FDD-Band (8, 3, 1) <b>2G</b> - Dual Band GSM/GPRS/EDGE - 900/1800 MHz
PLS8-X (North America):	<b>4G</b> - Penta Band LTE - 700/700/850/AWS (1700/2100)/1900 MHz - FDD-Band (13, 17, 5, 4, 2) <b>3G</b> - Tri Band UMTS (WCDMA) - 850/AWS (1700/2100)/1900 MHz - FDD-Band (5, 4, 2) <b>2G</b> - 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 with no damage; designed to survive a 1 m free drop on hardwood floor with no damage
Vibration:	MIL-STD-810G, method 514.6E-1
Humidity:	Up to 100%
Inflammability:	UL recognized, 94HB Flame Class Rating (3). 1.49mm
Chemical Resistance:	Cleaning agents, soapy water, industrial alcohol, water vapor, solar radiation (UV)

## Mechanical

Size:	14.1 D x 14.0 H (cm) 5.5 D x 5.5 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

<sup>1</sup> Depends on multipath environment, number of satellites in view, satellite geometry, and ionospheric activity

<sup>2</sup> Depends also on baseline length

<sup>3</sup> Requires a subscription from Hemisphere GNSS

<sup>4</sup> CMR and CMR+ do not cover proprietary messages outside of the typical standard

Authorized Distributor:



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# IronView CW400 Data Collector

## Professional Grade Rugged Handheld

### key features

- IP65 Certified
- Sunlight readable display
- 5-megapixel built-in camera
- Full communication set
- Built-in GPS receiver

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The IronView CW400 is Hemisphere GNSS' next-generation professional grade GNSS data collector. The rugged handheld includes a high-sensitivity GPS antenna and performs well in challenging environments, such as forests and urban areas.

The integrated 5-megapixel digital camera allows you to capture accurate pictures of the situation in the field. The CW400 is compatible with high-capacity MicroSD cards, ensuring there is enough storage space for large data and faster background maps. Integrated Bluetooth and wireless LAN capabilities enable the CW400 to connect to networks and other devices freely.

The CW400 is the perfect fit for field work. The rugged hand-held is designed with a 3.7" industrial high contrast, sunlight-readable touchscreen display. The CW400 meets the IP65 standard, making it both dust and waterproof. The two batteries last up to 14 hours and allow GPS data collection for a full working day without the need to recharge.



# IronView CW400 Data Collector

## Physical Specifications

Weight:	483g (including battery)
Size:	192*93*42mm
Operating Temperature:	-30°C to 60°C
Storage Temperature:	-40°C to 80°C
Protection Class:	IP65 dust and waterproof
Humidity:	5%-95 %, non-condensing
Vibration:	ASAE EP455 Section 5.15.1 Random, MIL-STD-810G, method 514.6E-I
Shock:	Withstands 1.2 m drop onto hard surface

## System Platform

Operating System:	Windows Mobile6.5
Processor:	TI Sitara™ AM335x 1GHz
Memory:	512M
Storage:	8G (default) up to 32G
External Storage:	Micro SD card up to 32G
Camera:	Internal, autofocus, 5 MP

## Interfaces

Display:	3.7inch, Blanview TFT,480×640VGA
Keypad:	Alphanumeric keypad Dedicated "START" and "CAMERA" key Programmable short-cut keys(2 on keypad and 1 on left side)
Connectors:	Serial port (DB9) USB OTG 2.0 (Mini AB type) DC in
Communication:	Bluetooth 2.1 EDR WLAN 802.11 a/b/n WCDMA 3.75G Five Bands UMTS/HSPA+ (WCDMA/FDD) (850/800, 900, 1900 and 2100 MHz), Quad-Band GSM (850/900/1800/1900 MHz)
Other:	Micro SIM Micro SDHC

## GNSS

Chipset:	uBlox M8T (with raw data output)
Receiver:	72 Channels GPS/QZSS L1 C/A GLONASS L10F BeiDou B1 SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN Galileo E1B/C
Update Rate:	1Hz
Position Accuracy:	2.5 m CEP (Autonomous) 2.0 m CEP (SBAS)
Cold Start Time:	30 seconds
Hot Start Time:	1 second
Update Rate:	1Hz

## Power supply

Internal Battery:	Removable Li-Ion battery 3400mAh 7.2V 24.48Wh
AC Power:	Input: 100V-240V 50/60Hz Output: 15V 2A
Operating Time:	Up to 10 hours

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