

AsteRx SB

Light and compact ruggedized multi-frequency GNSS receiver



The AsteRx SB is an IP68 compliant, multi-constellation, multi-frequency GNSS receiver ideal for rapid integration into machine control or sensor fusion applications. It offers an extensive range of cable and wireless connections for maximum flexibility.

Key Features

- ▶ **Quad-constellation, multi-frequency all-in-view RTK receiver**
- ▶ **Robust and compact IP68 weatherproof housing**
- ▶ **AIM+ interference monitoring and mitigation system**
- ▶ **Base and rover operation**
- ▶ **Bluetooth, WiFi, Ethernet, Serial and USB communications**

Small footprint, high performance

The AsteRx SB offers high-update rate, low-latency scalable positioning accuracy in a light and compact ruggedized housing.

GNSS+ technology

AIM+ can suppress the widest variety of interferers, from simple continuous narrowband signals to the most complex wideband and pulsed jammers. APME+ multipath estimator, unique in its ability to tackle short-delay multipath, enhances measurement quality while LOCK+ guarantees robust tracking of rapid signal dynamics during heavy machine vibrations.

Base or rover, real-time or offline RTK precision

The AsteRx SB offers full flexibility of operation. It can operate in RTK rover or base station mode and, with a 16 GB on-board memory, it can log data for offline post processed PPK.

Easy to integrate

The AsteRx SB comes with fully-documented interfaces, commands and data messages. The included RxTools software allows receiver configuration and monitoring as well as data logging and analysis. An SDK is provided to help integrators create professional custom applications. The AsteRx SB comes in two forms: the PRO Connect variant with multiple hardware cable connections and the Wireless variant.

Any device, any platform

Use any device with a web browser to operate the AsteRx SB without any special configuration software via the Web UI accessible over a WiFi or USB connection.

FEATURES

GNSS technology

448 hardware channels for simultaneous tracking of all visible satellite signals

Supported signals:

- ▶ GPS: L1, L2, L5
- ▶ GLONASS: L1, L2, L3
- ▶ Galileo¹: E1 BC (CBOC), E5 (a, b, AltBoc)
- ▶ BeiDou¹: B1, B2
- ▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- ▶ IRNSS¹: L5
- ▶ QZSS¹: L1, L2, L5
- ▶ Integrated dual-channel L-band receiver

Septentrio's patented GNSS+ technologies:

- ▶ *AIM+* unique anti-jamming and monitoring system against narrow and wideband interference
- ▶ *APME+* a posteriori multipath estimator for code and phase multipath mitigation
- ▶ *LOCK+* superior tracking robustness under heavy mechanical shocks or vibrations
- ▶ *IONO+* advanced scintillation mitigation

RAIM (Receiver Autonomous Integrity Monitoring)

RTK (base and rover)¹

PPP (Precise Point Positioning with *SeCoRx*)^{1,2}

Moving base^{1,3}

Formats

Septentrio Binary Format (SBF), fully documented with sample parsing tools

RTCM v2.x and v3.x (MSM included)

CMR and CMR+ (CMR+ input only)

NMEA 0183 v2.3, v3.01, v4.0 (output only)

RINEX¹ (obs, nav) v2.x, v3.x

Connectivity

3 Hi-speed serial ports (RS232)⁴

Ethernet port (TCP/IP, UDP, LAN 10/100 M bps)⁴

Power-Over-Ethernet⁴

1 full-speed USB device port⁴

1 USB OTG port

2 Event markers⁴

xPPS output (max. 100 Hz)⁴

Integrated Bluetooth (2.1 + EDR/4.0)

Integrated WiFi (802.11 b/g/n)

NTRIP (server, client, caster)

FTP server¹, FTP push¹, SFTP¹

2 simultaneous logging sessions

16 GB internal memory

PERFORMANCE

Position accuracy^{5,6}

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.8 m
DGNSS	0.4 m	0.7 m
SeCoRx-C (PPP) ^{2,7}	4 cm	6 cm

RTK performance^{5,6,8,9}

Horizontal accuracy	0.6 cm + 0.5 ppm
Vertical accuracy	1 cm + 1 ppm
Initialisation	7 s

Velocity accuracy^{5,6}

0.03 m/s

Maximum update rate

Position	100 Hz
Measurements	100 Hz

Latency¹⁰

< 10 ms

Time precision

xPPS Out ^{4,11}	5 ns
Event ⁴	< 20 ns

Time to first fix

Cold Start ¹²	< 45 s
Warm Start ¹³	< 20 s
Re-acquisition	avg. 1 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

STANDARD SYSTEM COMPONENTS

- ▶ On board Web UI and RxTools desktop software for all receiver controls and monitoring
- ▶ Other accessories (cables, mounting brackets, antennas, etc.) are available

MODELS

AsteRx SB PRO Connect: serial, USB, Ethernet, Bluetooth and WiFi connections

AsteRx SB Wireless: USB, Bluetooth and WiFi connections. Powered by USB OTG

PHYSICAL AND ENVIRONMENTAL

Size 102 x 36 x 111 mm
(4.0 x 1.4 x 4.4 in)

Weight 460 g (1.01 lb)

Input voltage⁴ 4.5 to 36 VDC

Power consumption⁴ 1.5 W typical

Operating temperature -30 °C to +65 °C
(-22 °F to 149 °F)

Storage temperature -40 °C to +75 °C
(-40 °F to 167 °F)

Humidity MIL-STD810G, Method 507.5, Procedure I

Dust MIL-STD-810G, Method 510.5, Procedure I

Shock MIL-STD-810G, Method 516.6, Procedure I/II

Vibration MIL-STD-810G, Method 514.6, Procedure I

Connectors

Antenna	TNC female
ETH ⁴	ODU 4 pins female
COM1/GPIO ⁴	ODU 7 pins female
PWR/USB/COM2/COM3 ⁴	ODU 7 pins female
USB OTG	Micro USB

Antenna LNA power output

Output voltage	5 VDC
Maximum current	200 mA

Certification

IP68, RoHS, CE
FCC Class B Part 15
IEC 60950

¹ Optional feature

² Service subscription required

³ Maximum output rate is 20 Hz

⁴ Applicable to the ODU model only

⁵ Open sky conditions

⁶ RMS levels

⁷ After convergence

⁸ RTK fixed ambiguities

⁹ Baseline < 40 Km

¹⁰ 99.9%

¹¹ Including software compensation of sawtooth effect

¹² No information available (no almanac, no approximate position)

¹³ Ephemeris and approximate position known