

# AsteRx SB

Light and compact ruggedized multi-frequency GNSS receiver



**The AsteRx SB is a 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 an on-board 16 GB 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.

### 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 WiFi network 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
- ▶ Galileo<sup>1</sup>: E1 BC (CBOC), E5 (a, b, AltBoc)
- ▶ BeiDou<sup>1</sup>: B1, B2
- ▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- ▶ IRNSS<sup>1</sup>: L5
- ▶ QZSS<sup>1</sup>: 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)<sup>1</sup>

Support for PPP (SeCoRx)<sup>1,2</sup>

Moving base<sup>1,3</sup>

### 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)

RINEX<sup>1</sup> (obs, nav) v2.x, v3.x

### Connectivity

3 Hi-speed serial ports (RS232)<sup>4</sup>

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

Power-Over-Ethernet<sup>4</sup>

1 full-speed USB device port<sup>4</sup>

1 USB OTG port

2 Event markers<sup>4</sup>

xPPS output (max. 100 Hz)<sup>4</sup>

Integrated Bluetooth (2.1 + EDR/4.0)

Integrated WiFi (802.11 b/g/n)

NTRIP (server, client, caster)

FTP server<sup>1</sup>, FTP push<sup>1</sup>, SFTP<sup>1</sup>

2 simultaneous logging sessions

16 GB internal memory

## PERFORMANCE

### Position accuracy<sup>5,6</sup>

|                               | 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) <sup>2,7</sup> | 4 cm       | 6 cm     |

### RTK performance<sup>5,6,8,9</sup>

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

### Velocity accuracy<sup>5,6</sup>

0.03 m/s

### Maximum update rate

|              |        |
|--------------|--------|
| Position     | 100 Hz |
| Measurements | 100 Hz |

### Latency<sup>10</sup>

< 10 ms

### Time precision

|                        |         |
|------------------------|---------|
| xPPS Out <sup>11</sup> | 5 ns    |
| Event                  | < 20 ns |

### Time to first fix

|                          |          |
|--------------------------|----------|
| Cold Start <sup>12</sup> | < 45 s   |
| Warm Start <sup>13</sup> | < 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 voltage** 4.5 to 36 VDC

**Power consumption<sup>4</sup>** 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

|                                |                    |
|--------------------------------|--------------------|
| Antennas                       | TNC female         |
| ETH <sup>4</sup>               | LEMO 4 pins female |
| COM1/GPIO <sup>4</sup>         | LEMO 7 pins female |
| PWR/USB/COM2/COM3 <sup>4</sup> | LEMO 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

<sup>1</sup> Optional feature

<sup>2</sup> Service subscription required

<sup>3</sup> Maximum output rate is 20 Hz

<sup>4</sup> Applicable to the ODU model only

<sup>5</sup> Open sky conditions

<sup>6</sup> RMS levels

<sup>7</sup> After convergence

<sup>8</sup> RTK fixed ambiguities

<sup>9</sup> Baseline < 40 Km

<sup>10</sup> 99.9%

<sup>11</sup> Including software compensation of sawtooth effect

<sup>12</sup> No information available (no almanac, no approximate position)

<sup>13</sup> Ephemeris and approximate position known

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