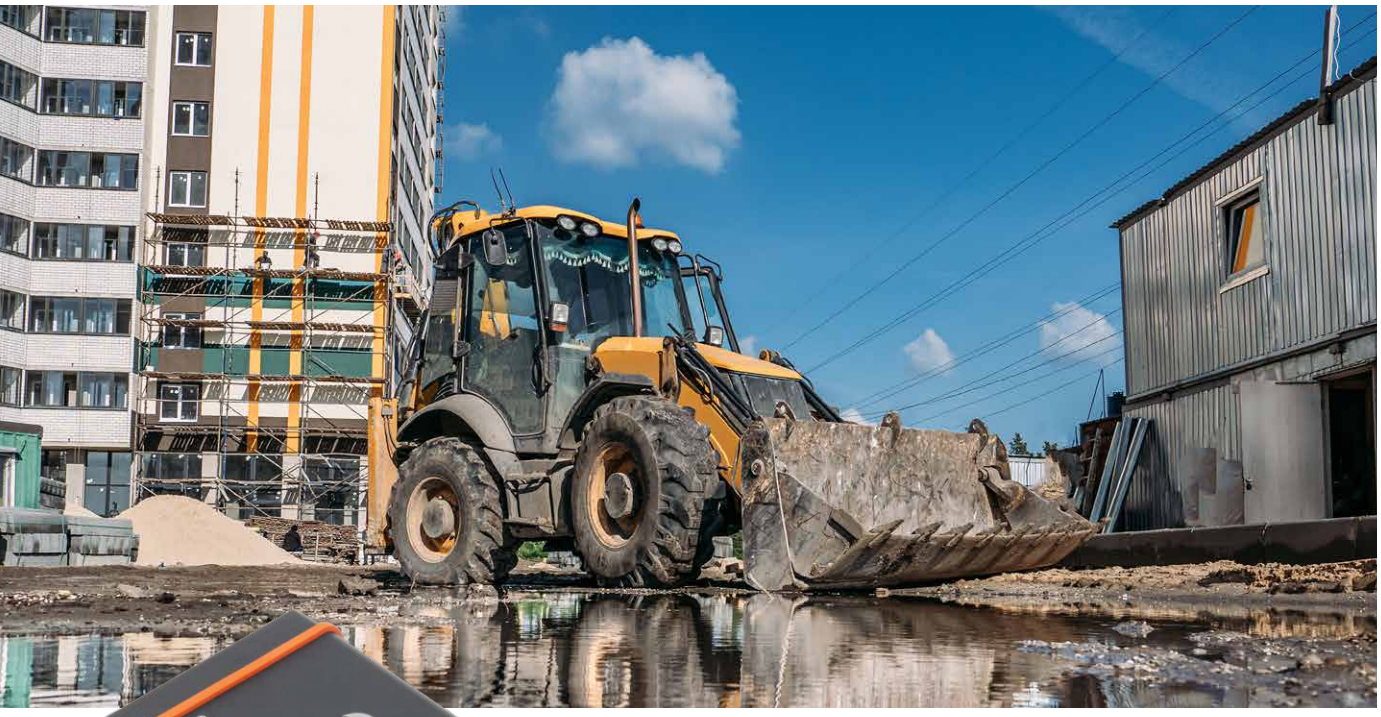
AsteRx SBi

Housed GNSS/INS positioning and attitude receiver

septentrio



Logistics

Construction

Robotics

Automation

Precision Agriculture

AsteRx SBi fuses multi-frequency and multi-constellation GNSS with an industrial-grade IMU (Inertial Measurement Unit), delivering precise positioning, 3D orientation and coasting functionality. This housed high performance GNSS/INS system is ideal for rapid integration into machine control or safety applications.

KEY FEATURES

- **Reliable and accurate GNSS/INS positioning down to the cm level**
- **3D attitude - heading, pitch and roll**
- **Robust and compact IP68 weatherproof housing**
- **AIM+ interference monitoring and mitigation system**
- **High update rate, constant low latency, integrated positioning and attitude**

Reliability, availability and accuracy at their best

Septentrio's multi-constellation, multi-frequency, accurate and reliable RTK is further enhanced by a powerful GNSS/INS integration. AsteRx SBi provides accurate and reliable positioning and 3D attitude.

The AsteRx SBi includes Septentrio's GNSS+ suite of positioning algorithms to convert difficult environments into good positioning. It also features the Advanced Interference Mitigation and Monitoring (AIM+) system which can suppress the widest variety of interferers. APME+ multipath mitigation ensures accuracy near high buildings or next to metal structures.

Small footprint, high flexibility

The AsteRx SBi offers high-update rate, low-latency, accurate and highly available positioning and 3D orientation in a compact ruggedized housing. Users have the flexibility of choice for single or dual antenna modes, internal logging or real-time data streaming via the connectors.

Ease of integration

The AsteRx SBi integrates seamlessly in any system thanks to fully documented interfaces, commands and data messages. Septentrio's open interfaces and software tools (WebUI, RxTools) make the integration, configuration and control of the AsteRx SBi seem effortless.

AsteRx SBi

FEATURES

GNSS technology

Tracking the following signals:

- GPS: L1, L2
- GLONASS: L1, L2
- Galileo[1]: E1, E5b
- BeiDou[1]: B1, B2
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1)
- QZSS: L1, L2

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-INS (rover)[1]

Formats

Septentrio Binary Format (SBF), fully documented with sample parsing tools
RTCM v2.x and v3.x (input only)
CMR and CMR+ (input only)
NMEA 0183 v2.3, v3.01, v4.0 (output only)

Connectivity

3 Hi-speed serial ports (RS232)

Ethernet port (TCP/IP, UDP, LAN 10/100 Mbps)

Power over ethernet

1 High-speed/full-speed USB device port

2 Event markers

FTP server

16 GB internal memory

SUPPORTING COMPONENTS

Embedded Web UI with full control and monitoring functionality.

RxTools, a complete and intuitive GUI tool set for receiver control, monitoring, data analysis and conversion.

GNSS receiver communication SDK. Available for both Windows and Linux.

PERFORMANCE

Integrated position accuracy [2,3]

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.8 m
DGPS	0.4 m	0.7 m

RTK-INS [2,3,4]

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

Integrated attitude accuracy [2,3,4]

	Non RTK mode	RTK mode
Heading, dual antenna[5]	0.3°	0.15°
Heading, single antenna	0.3°	0.2°
Pitch/roll, dual antenna	0.04°	0.02°

INS velocity [2,3,4]

	Non RTK mode	RTK mode
Velocity	0.05 m/s	0.02 m/s

Position accuracy after outages

Outage duration (s)	Horizontal error (RMS)	Vertical error (RMS)
5	0.1 m	0.03 m
10	0.3 m	0.05 m
30	3.0 m	0.24 m

Attitude accuracy after outages

Outage duration (s)	Heading error (RMS)	Pitch/Roll error (RMS)
5	0.23°	0.06°
10	0.25°	0.07°
30	0.3°	0.12°

IMU performance

Gyroscope performance

Input range	± 450°/s
Bias in-run instability	7°/hr
Random walk / noise density	0.15°/√hr

Accelerometer performance

Input range	±16 g
Bias in-run instability	0.014 mg
Random walk / noise density	57 µg/√Hz

Maximum update rate

Integrated position	100 Hz
Latency	<20 ms
Post-processing:	
GNSS measurements	2 Hz
IMU raw data	200 Hz

Time precision

PPS out	5 ns
Event accuracy	< 20 ns

Time to first fix

Cold start [6]	< 45 s
Warm start [7]	< 20 s
Re-acquisition	avg 1.2 s

Tracking performance (C/N0 threshold)[8]

Tracking	20 db-Hz
Acquisition	33 db-Hz

PHYSICAL AND ENVIRONMENTAL

AsteRx SBi

Size	102 x 36 x 118 mm / 4.0 x 1.4 x 4.6 in
Weight	497 g / 1.1 lb
Input voltage	4.5 to 36 VDC
Power consumption	1.5 W single antenna 1.8 W dual antenna

Connectors

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

Antenna(s)

Output voltage	5 VDC
Maximum current	200 mA

Environment

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-STD-810G, 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

Certification

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

[1] Optional feature
[2] Open-sky conditions
[3] RMS levels
[4] Baseline < 40 km / 25 miles
[5] 1 m / 3.3 ft baseline
[6] No information available (no almanac, no approximate position)
[7] Ephemeris and approximate position known
[8] Depends on user settings of tracking loop parameters, Max speed 600 m/s

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EMEA (HQ)
Greenhill Campus
Interleuvenlaan 15i
3001 Leuven, Belgium
+32 16 30 08 00
septentrio.com

Americas
Suite 200
23848 Hawthorne Blvd
Torrance, CA 90505, USA
+1 310 541 8139
sales@septentrio.com

Asia-Pacific
Shanghai, China
Yokohama, Japan

septentrio