AsteRx RB3 Pro+

Rugged GNSS positioning and heading receiver

septentrio
part of HEXAGON

Construction

Logistics & Port Operations

Mining

Automation

AsteRx RB3 Pro+ high-accuracy GNSS heading receiver is designed to withstand the harshest of working environments in terms of temperature, corrosion as well as shock and vibration. It offers flexibility of use with no performance compromises.

KEY FEATURES

- **Rugged and durable IP69K housing**
- **High-accuracy RTK positioning with all-in-view, GNSS multi-frequency satellite tracking**
- **Sub-degree GNSS heading & pitch or heading & roll**
- **Flexibility to be used either as a rover or a base station**
- **GNSS+ algorithms ensure reliable performance in difficult environments**
- **Update rate up to 100 Hz**

Reliable heading performance

With dual-antenna input, AsteRx RB3 Pro+ provides precise, reliable and position independent heading combined with centimeter-level RTK. GNSS heading provides unmatched performance in both static and dynamic conditions removing the reliance on vehicle dynamics or magnetic sensors.

Reliable positioning in harsh environments

Ultra-rugged housing combined with multi-frequency tracking and GNSS+ algorithms make AntaRx RB3 Pro+ the ideal GNSS receiver for applications that require accurate position in chemically aggressive environments, harsh temperatures and high mechanical stress. Its high-update rate and low-latency output means quick feedback loops during rotation or movement.

Ease of integration

The AsteRx RB3 Pro+ integrates seamlessly into any system thanks to fully documented machine interfaces, commands and data messages. Septentrio's open interfaces and software tools (WebUI, RxTools) make it easy to the integrate, configure and control the AsteRx RB3 Pro+ receiver.

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FEATURES

GNSS signals

544 Hardware channels for simultaneous tracking of most visible signals:

- GPS: L1 C/A, L1C, L2C, L2 P(Y), L5
- GLONASS: L1 C/A, L2C/A, L3, L2P
- BeiDou: B1I, B1C, B2a, B2b, B2I, B3I
- Galileo: E1, E5a, E5b, E5 AltBOC, E6
- QZSS: L1 C/A, L1C/B, L2C, L5
- NavIC: L5
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM

Septentrio's patented GNSS+ technologies

- **AIM+** industry leading anti-jamming, anti-spoofing interference monitoring & mitigation technology
- **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)

Formats

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

NMEA 0183, v3.01, v4.0

RTCM v2.x, v3.x (MSM messages included)

CMR v2.0 and CMR+ (CMR+ input only)

Connectivity

2 x RS232

USB full speed (device)

CAN/CAN-FD

Ethernet 10/100Mbps

2 x Event markers

xPPS out

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

RTK performance [1,2,3]

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

GNSS attitude accuracy [1,2]

Antenna separation	Heading	Pitch/Roll
1 m	0.15°	0.25°
5 m	0.03°	0.05°

Position accuracy [1,2]

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

Velocity accuracy [1,2]

0.03 m/s

Maximum update rate

Position	100 Hz
Measurements	100 Hz

Latency [4]

<10 ms

Time precision

xPPS out[5]	5 ns
Event accuracy	< 20 ns

Time to first fix

Cold start[6]	< 45 s
Warm start[7]	< 20 s
Re-acquisition	avg. 1 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

PHYSICAL AND ENVIRONMENTAL

SWaP

Size	168 x 118 x 51 mm
Weight	850 g
Input voltage	9 to 32 VDC

Power consumption

GPS/GLO L1/L2	1.1 W
All signals, all GNSS constellations	1.3 W
Maximum	2.5 W

Connectors

Antenna	2 x TNC
IO interfaces	23-pin TE AmpSeal

Antenna LNA power output on TNC

Output voltage	5 VDC
Maximum current	150 mA

Environmental

Operating temperature: -40°C to +70°C

Ingress protection: IP69K (with mated connectors)

ISO20653 (Road vehicles)

MIL-STD-810H Method 510.7 (Dust) Procedure I (Blowing Dust)

Humidity: >95% RH

IEC 60068-2-38 Test Z/AD

MIL-STD-810H Method 507.6 (Humidity) Procedure II (Aggravated)

Vibration:

ISO16750-3 Test VII — Commercial vehicle, sprung mass (vehicle body) RMS 57,9m/s²

ISO16750-3 Test IX — Commercial vehicle, unsprung mass 150-300m/s²

MIL-STD-810H Method 514.8 (Vibration) Procedure I (General Vibration - Common carrier)

Shock:

ISO16750-3 Shock II — Test for devices on rigid points on the body and on the frame 500 m/s²

MIL-STD-810H Method 516.8 (Shock) Procedure I (Functional Shock – Ground Materiel)

Certification

RoHS, WEEE, CE, FCC

[1] Open sky conditions
[2] RMS level
[3] Baseline < 40 Km
[4] 99.9%
[5] Including software compensation of sawtooth effect
[6] No information available (no almanac, no approximate position)
[7] Ephemeris and approximate position known

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EMEA
Greenhill Campus (HQ)
Interleuvenlaan 15i
3001 Leuven, **Belgium**

Espoo, **Finland**

Americas
2601 Airport Drive,
Suite 360
Torrance, CA 90505, **USA**

septentrio.com/contact

Asia-Pacific
Shanghai, **China**
Yokohama, **Japan**
Seoul, **Korea**

septentrio.com

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