

AsteRx2: GPS/GLONASS Dual-frequency OEM Receiver

The AsteRx2 receiver is an all-in-view dual-frequency GPS/GLONASS receiver board for demanding industrial applications. As member of the AsteRx-family of compact OEM boards, AsteRx2 features proven high-quality all-in-view GPS and GLONASS tracking and Septentrio's advanced multipath mitigation algorithm APME, offering excellent measurement quality for high precision positioning, even in challenging environments.



Industrial GPS/GLONASS Receiver

The AsteRx2 OEM board is a next generation L1/L2 GPS/GLONASS/SBAS OEM receiver platform. It is designed for high-performance dual-frequency applications. AsteRx2 features 48 dual-frequency channels for all-in-view mixed GPS/GLONASS and SBAS tracking.

The receiver provides an extensive set of measurements (raw data, position velocity, time) at up to 20 Hz. Septentrio's A Posteriori Multipath Estimator (APME), unique in its ability to tackle short-delay multipath, further enhances the quality of the measurement and position data generated with the receiver.

Providing extra robustness with GLONASS

Signal blocking by buildings, trees, mountains and other obstructions provide limitations to applicability of GPS in the most challenging professional applications requiring high-precision position data. AsteRx2 tracks GLONASS as well as GPS satellites, and generates high-quality GLONASS measurements, which are used together with GPS measurements for improved availability and accuracy, especially in these challenging environments.

Easy to integrate

AsteRx2 features low power consumption and is available in a compact OEM board version, making it suitable for on-board as well as portable battery operated applications. For the latter, an innovative and flexible power management under user control, aids integrators to save power and extend autonomy significantly.

For ready-to-use solutions, the AsteRx2 can be delivered in a waterproof IP65 rugged enclosure with sturdy connectors, allowing usage in tough conditions.

Flexible configuration, a powerful command language, a variety of detailed output messages and formats suited for automation, serial and USB2.0 interfaces, all facilitate the work of the system integrator.

Last but not least, as with all Septentrio GNSS receivers, an intuitive GUI - RxControl - can be used with the AsteRx2 for its configuration, for logging and remote control. Moreover, RxControl includes a host of enhanced visualization features. RxControl is available both on Windows and Linux platforms, as well as on WindowsMobile for PDA platforms (RxMobile).

Finally, the AsteRx2 platform also conforms to the latest legislation, including the European Union's RoHS (Restriction of Hazardous Substances) directive.

ASTERx2 TECHNICAL SPECIFICATIONS



FEATURES

- Dual-frequency L1/L2 code/carrier tracking of GPS and GLONASS signals.
- 48 hardware channels for simultaneous tracking of all visible satellites in GPS and GLONASS constellations
- Includes up to 3 SBAS channels (EGNOS, WAAS, other)
- Raw data output (code, carrier, SBAS navigation data)
- Up to 20 Hz raw measurement PVT output rate (user selectable)
- A Posteriori Multipath Estimator technique (APME)
- Differential GPS and RTK capabilities (rover)
- x PPS output (x = 1, 2, 5, 10)
- 10 MHz reference output
- EGNOS and WAAS compatible
- Provision of protection levels in SBAS positioning mode (HPL/VPL)
- RAIM included
- Three serial ports (RS232/LVTTL) and 1 full speed USB port
- Highly compact and detailed Septentrio Binary Format (SBF) output, up to 20 Hz
- NMEA v2.30 output format, up to 5 Hz
- Compact OEM board solution
- Innovative and flexible power management under user control
- OEM board or mounted in IP65 waterproof enclosure
- Includes intuitive GUI (RxControl) and detailed operating and installation manual

OPTIONS

- Differential GPS base station
- GPS and GPS/GLONASS RTK
 - RTCM v2.3 or 3.0 input/output
 - Reference Station Network compatible (FKP)
 - CMR 2.0
- 2 Event markers

FEATURES

Position accuracy ^{1,2,3}		
	Horizontal	Vertical
Standalone	1.1 m	1.9 m
SBAS	0.7 m	1.2 m
DGPS	0.35 m	0.65 m
RTK performance ^{1,14}		
	Horizontal accuracy ³	1 cm + 1ppm
	Vertical accuracy ³	2 cm + 2ppm
	Average time to fix ⁴	7 sec
	Availability ⁴	> 99,8 %
Velocity Accuracy ^{1,2,3}		
	Horizontal	Vertical
Standalone	5 mm/sec	8 mm/sec
Maximum Output rate		
		20 Hz
Latency		
		<25 msec
Time accuracy ³		
1PPS		10 nsec
Measurement precision ^{1,3,5}		
C/A pseudoranges		5 cm (GPS) ⁶
		0.15 m (GPS) ^{7,8}
		0.30 m (GPS) ^{7,9}
		0.25 m (GLONASS) ^{7,8}
		0.45 m (GLONASS) ^{7,9}
GPS P1/P2 pseudoranges ⁷		0.1 m
GLONASS P pseudoranges ⁷		0.1 m
L1 carrier phase		1.5 mm
L2 carrier phase		1 mm
L1/L2 doppler		20 mHz
Time to first fix		
Cold start ¹⁰		< 45 sec
Warm start ¹¹	After power-on	< 35 sec
	After reset	< 15 sec
Re-acquisition		< 1 sec
Tracking performance (C/N₀ threshold) ^{12,13}		
Code phase tracking		19 dB-Hz
Carrier phase tracking		26 dB-Hz
Acquisition		33 dB-Hz
Acceleration		20 g
Jerk		3 g/sec

- 1 1 Hz measurement rate
- 2 Performance depends on environmental conditions
- 3 1 σ level
- 4 Baseline < 20 km
- 5 C/N₀ = 45 dB-Hz
- 6 Smoothed
- 7 Non-smoothed
- 8 Multipath mitigation disabled
- 9 Multipath mitigation enabled
- 10 No information available (no almanacs, no approximate position)
- 11 Almanacs and approximate position known, no ephemeris known
- 12 95%
- 13 Max speed 600 m/sec
- 14 Fixed ambiguities

PHYSICAL AND ENVIRONMENTAL

Size	60 x 90 mm
Weight	120g
Input voltage	3.3 VDC \pm 5%
Antenna LNA Power Output	
Output voltage	+ 3.3 VDC
Maximum current	200 mA
Power consumption	2W typical, 2.5W max
Operating temperature	-40 to +70°C
Storage temperature	-40 to +85°C
Humidity	5% to 95% (non condensing)
Input/Output Connectors	
I/O connector	2x60 pin (female)
Antenna	MMCX
Communications	
3 serial ports (RS232/LVL-TTL) up to 115 kbps (user configurable)	
1 full speed USB 2.0	

OTHER SEPTENTRIO PRODUCTS

AsteRx1 - Compact single-frequency GNSS receiver platform, offering top-quality GPS code and carrier phase data and single frequency positioning (including DGPS and L1-RTK) at up to 50 Hz, with a seamless upgrade possibility to Galileo.

PolaRx2e and PolaRx2e_OEM - Dual-frequency GNSS receiver platform for high-end applications.

PolaRx2eH and PolaRx2e@ - A unique single-board dual-frequency multi-antenna receiver that can be connected to 2, respectively 3 antennas, for various machine control, heading/attitude and other multi-antenna applications.

PolaRx2C - The PolaRx2C can track up to 4 satellites in L2C mode. For these satellites, the CA, P1, P2 and L2C measurements are available simultaneously.

GeNeRx1 - A combined scientific GPS/Galileo receiver, which can be flexibly configured to simultaneously track Galileo as well as GPS satellites in multi-frequency mode. All Galileo frequencies and modulations are supported.

PolaNt - A lightweight precise positioning and survey single or dual-frequency antenna for use with the PolaRx family.

RxControl - RxControl is an intuitive user interface to configure and control all types of PolaRx receivers and monitor, log and post data remotely.

RxMobile - A unique intuitive, portable GUI field controller for the PolaRx receivers. RxMobile allows controlling the receiver, monitoring the navigation solution and accessing its functions in the field in the same intuitive way as with RxControl.



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