

## AsteRx2e: GPS/GLONASS Dual-frequency Receiver family

*The AsteRx2e receiver family provides all-in-view dual-frequency GPS/GLONASS receivers for demanding industrial applications. As member of the AsteRx-family of compact OEM boards, AsteRx2e 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 AsteRx2e receiver family is powered by a next generation L1/L2 GPS/GLONASS/SBAS OEM receiver engine. Built around the 136 channel multi frequency multi constellation GReCo3 ASIC AsteRx2e is designed for high-performance dual-frequency applications.

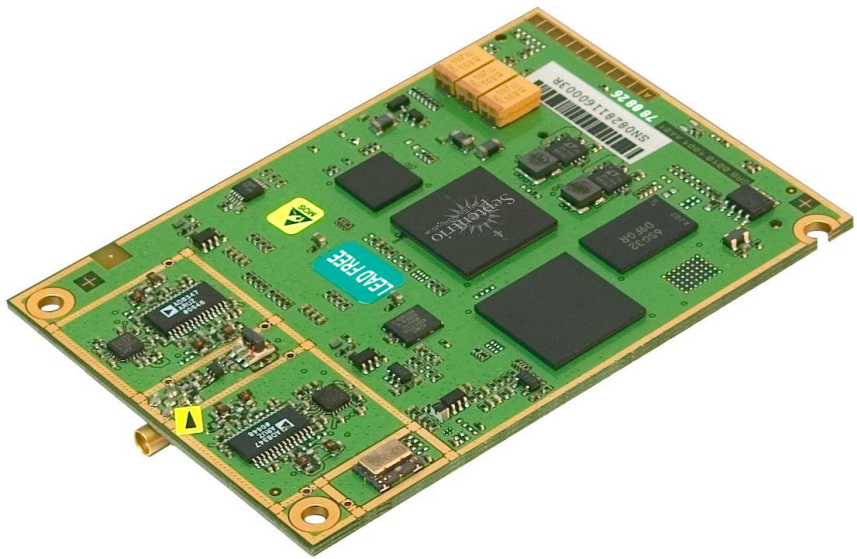
The receiver provides high quality cm-level positioning as well as an extensive set of measurements (raw data, position velocity, time, RTK) at up to 25 Hz. Septentrio's A Posteriori Multipath Estimator (APME), unique in its ability to tackle short-delay multipath, further enhances the quality of the 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. AsteRx2e 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

AsteRx2e 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.

An innovative and flexible power management under user control, aids integrators to save power and extend autonomy significantly.

Besides the OEM board the AsteRx2e is available in a compact waterproof plastic housing (AsteRx2e HDC). 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.

As with all Septentrio GNSS receivers, an intuitive GUI - RxControl - can be used

with the AsteRx2e 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).



## ASTERX2e TECHNICAL SPECIFICATIONS

### FEATURES

- Dual-frequency L1/L2 code/carrier tracking of GPS and GLONASS signals.
- 136 hardware channels for simultaneous tracking of all visible satellites in GPS and GLONASS constellations
- 25 Hz data output rate (user selectable)
- A Posteriori Multipath Estimator technique (APME)
- Moving Base support
- Differential GPS (base station and rover)
- Includes up to 3 SBAS channels (EGNOS, WAAS, other)
- Innovative and flexible power management under user control
- x PPS output (x = 1, 2, 5, 10)
- 2 Event markers
- RAIM included
- Raw data output (code, carrier, navigation data)
- Four hi-speed serial ports
- 1 full speed USB port
- Highly compact and detailed Septentrio Binary Format (SBF) output
- NMEA v2.30 output format, up to 10 Hz
- RTCM v2.2, 2.3, 3.0 or 3.1
- CMR2.0 and CMR+
- Compact OEM board and IP65 housed solutions
- Includes intuitive GUI (RxControl) and detailed operating and installation manual

### ASTERX2e PRODUCTS



AsterX2e OEM



Integrator Kit



AsterX2e HDC

### PERFORMANCE

<b>Position accuracy</b> <sup>1,2,3,6</sup>		
	Horizontal	Vertical
Standalone	1.3 m	1.9 m
SBAS	0.6 m	0.8 m
DGPS	0.5 m	0.9 m
<b>RTK performance</b> <sup>1,14</sup>		
Horizontal accuracy <sup>3</sup>	0.6 cm + 0.5ppm	
Vertical accuracy <sup>3</sup>	1 cm + 1ppm	
Average time to fix <sup>4</sup>	7 sec	
<b>Velocity Accuracy</b> <sup>1,2,3</sup>		
	Horizontal <sup>3</sup>	Vertical <sup>3</sup>
	0.8 cm/sec	1.3 cm/sec
<b>Attitude Accuracy</b> <sup>1,2</sup>		
Heading	1.0°	
Pitch/Roll	0.5°	
<b>Maximum Update rate</b>		
Latency	25 Hz < 20 msec	
<b>Time accuracy</b> <sup>3</sup>		
1PPS	10 nsec	
Event accuracy	< 10 nsec	
<b>Measurement precision</b> <sup>1,3,5</sup>		
C/A pseudoranges	5 cm (GPS) <sup>6</sup> 0.16 m (GPS) <sup>7,8</sup> 7 cm (GLONASS) <sup>6</sup> 0.25 m (GLONASS) <sup>7,9</sup>	
GPS P2pseudoranges <sup>7</sup>	0.1 m	
GLONASS P pseudoranges <sup>7</sup>	0.1 m	
L1 carrier phase	1 mm	
L2 carrier phase	1 mm	
L1/L2 doppler	0.02 Hz	
<b>Time to first fix</b>		
Cold start <sup>10</sup>	< 45 sec	
Warm start <sup>11</sup>	< 20 sec	
Re-acquisition	avg 1.2 sec	
<b>Tracking performance (C/N<sub>0</sub> threshold)</b> <sup>12,13,15</sup>		
Tracking	26 dB-Hz	
Acquisition	33 dB-Hz	
Acceleration <sup>16</sup>	10 g	
Jerk <sup>17</sup>	4g/sec	

- 1 1 Hz measurement rate
- 2 Performance depends on environmental conditions
- 3 1σ level
- 4 Baseline < 20 km
- 5 C/N<sub>0</sub> = 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 Ephemeris and approximate position known
- 12 95%
- 13 Max speed 600 m/sec
- 14 Fixed ambiguities
- 15 Depends on user settings of tracking loop parameters
- 16 During acquisition
- 17 During tracking

### PHYSICAL AND ENVIRONMENTAL

<b>OEM</b>	
Size	60 x 90 mm
weight	60 g
Input voltage	+3.3 VDC
<b>HDC</b>	
size	130 x 185 x 46 mm
weight	510 g
Input voltage	9-30 VDC
<b>Antenna LNA Power Output</b>	
Output voltage	+ 5VDC
Maximum current	200 mA
<b>Power consumption</b>	1.5W typical
<b>Operating temperature</b>	-40 to +70 °C
<b>Storage temperature</b>	-40 to +85 °C
<b>Humidity</b>	5% to 95% (non condensing)
<b>Connectors</b>	
Antenna	TNC female
Power (HDC Housing)	ODU 5 pins female
COM1 (HDC Housing)	ODU 16 pins female
COM2 (HDC Housing)	ODU 16 pins female

### OTHER SEPTENTRIO PRODUCTS

**AsterRx1** - Compact single-frequency GNSS receiver platform, offering top-quality GPS and Galileo code and carrier phase data and single frequency positioning (including GPS DGPS and L1-RTK) at up to 50 Hz.

**AsterRx2eH** - A unique single-board dual-frequency multi-antenna GPS/GLONASS receiver in a waterproof aluminum housing, that can be connected to 2 antennas for various machine control, heading and other multi-antenna applications.

**AsterRxi** - IMU assisted Compact Dual-frequency GNSS receiver platform, offering a 50Hz RTK position based on integrated IMU and GNSS measurements. In addition attitude information such as heading, pitch and roll are provided even in shadowed environments where conventional GNSS receivers fail.

**PolaRx3e/3eG/3eTR** - A family of versatile high-accuracy dual-frequency GNSS receivers for precise positioning and navigation applications. Next to high-quality GPS measurements, it provides GLONASS dual-frequency data as well as modernized GPS (L2C). PolaRx3eG provides access to the new and upcoming Galileo signals whereas PolaRx3eTR is a dedicated GPS/GLONASS/GALILEO Timing/Reference receiver.

**PolaRx2e@** - A unique single-board dual-frequency 3-antenna receiver for various machine control, attitude and other multi-antenna applications.

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

**PolaNt\*\_MC** - A lightweight sturdy precise positioning and survey single or multi-frequency GPS or GPS/GLONASS L-band antenna for use with the AsterRx and 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 Septentrio 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.

