

# AsteRx2eH : GPS/GLONASS Dual-frequency Heading receiver

*AsteRx2eH is a single-board dual-frequency dual-antenna GPS/GLONASS heading receiver, specially designed for demanding machine control, marine survey, photogrammetry and other multi-antenna applications. As member of the AsteRx-family of compact OEM boards, AsteRx2eH is built around the same advanced GNSS chipset and shares the family's high-quality all-in-view GPS and GLONASS tracking and advanced signal processing algorithms for robust tracking and high precision positioning, even in challenging environments.*

## Proven heading/dual-antenna performance

AsteRx2eH is the successor of the successful PolaRx2eH receiver, now in an even more compact and low-power design, with all the new capabilities the latest ASIC and the AsteRx2e family bring.

It features 272 HW multi frequency multi constellation tracking channels from the GReCo3™ ASIC, to provide a compact and low power solution for cm-level positioning combined with accurate heading information, at up to 20 Hz.

Of course AsteRx2eH shares the advanced signal processing of the AsteRx2e family, such as Septentrio's LOCK+™ ultra-robust tracking under shock and vibration, and A Posteriori Multipath Estimator (APME™) for superior short-delay multipath mitigation.

## Extra availability 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. AsteRx2eH 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

Not only does AsteRx2eH share the advanced signal processing and position calculation



features of AsteRx2e, the interface compatibility with the AsteRx1 and AsteRx2e family of receivers make it extra easy for integrators to build applications for different accuracy and application requirements with the various Septentrio receivers with minimal or no redesign.

AsteRx2eH is available as OEM board for integration in on-board applications. The receiver can also be supplied integrated in a tough waterproof aluminium housing (AsteRx2eH PRO), which can be easily used in any outdoor environment, but which also remains compact for easy storage in a machine cab or other confined space.

Flexible configuration, a powerful command language; a variety of detailed output

messages and formats suited for automation; serial, USB2.0 and Ethernet 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).

## ASTERX2eH TECHNICAL SPECIFICATIONS

### FEATURES

- Dual-frequency L1/L2 code/carrier tracking of GPS and GLONASS signals on 2 antennas.
- 272 hardware channels for simultaneous tracking of all visible satellites in GPS and GLONASS constellations
- Simultaneous RTK and heading calculation
- Up to 20 Hz measurement, position and orientation update rate (user selectable)
- Lock+™ tracking technology
- Automatic or manual antenna calibration
- A Posteriori Multipath Estimator (APME)
- Innovative and flexible power management under user control.
- Includes up to 3 SBAS channels (EGNOS, WAAS, other)
- x PPS output (x = 1, 2, 5, 10)
- 2 Event markers
- RAIM
- Raw data output (code, carrier, navigation data)
- Four hi-speed serial ports
- 1 full speed USB port
- Ethernet
- Highly compact and detailed Septentrio Binary Format (SBF) output
- NMEA v2.30 output format, (10 Hz max)
- RTCM v2.2, 2.3, 3.0 or 3.1
- CMR2.0 and CMR+
- Compact OEM board and housed solution
- Internal data logging in housed receiver (2GB)
- Includes intuitive GUI (RxControl) and detailed operating and installation manual

### ASTERX2EH PRODUCTS



AsterRx2eH OEM



Integrator Kit



AsterRx2eH PRO

### PERFORMANCE

Position accuracy <sup>1,2,3,6</sup>	Horizontal	Vertical
	Standalone	1.3 m
SBAS	0.6 m	0.8 m
DGPS	0.5 m	0.9 m

RTK performance <sup>1,14</sup>	
Horizontal accuracy <sup>3</sup>	1 cm + 1ppm
Vertical accuracy <sup>3</sup>	2 cm + 2ppm
Average time to fix <sup>4</sup>	7 sec

Velocity Accuracy <sup>1,2,3</sup>	Horizontal <sup>3</sup>	Vertical <sup>3</sup>
	Standalone	0.8 cm/sec

Heading Accuracy	
1m antenna separation	
Heading	0.3°
Pitch or Roll	0.6°

10m antenna separation	
Heading	0.03°
Pitch or Roll	0.06°

Maximum Update rate	
Latency	< 20 msec

Time accuracy <sup>3</sup>	
1PPS	10 nsec
Event accuracy	< 10 nsec

Time to first fix	
Cold start <sup>10</sup>	< 45 sec
Warm start <sup>11</sup>	< 20 sec
Re-acquisition	avg 1.2 sec

Tracking performance (C/N <sub>0</sub> threshold) <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 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	77 x 120 mm
weight	90 g
Input voltage	+3.0 - 5.5 VDC
<b>PRO</b>	
Size	245 x 140 x 37 mm
Weight	980 g
Input voltage	9-30 VDC
<b>Antenna LNA Power Output</b>	
Output voltage	+ 5VDC or ext.
Maximum current	200 mA
<b>Power consumption</b>	
Operating temperature	-40 to +70 °C
Storage temperature	-40 to +85 °C
Humidity	5% to 95% (non condensing)
<b>Connectors</b>	
Antenna	2 x TNC female
10 MHz in	BNC female
PPS out	BNC female
Power	ODU 3 pins female
COM1	ODU 7 pins female
COM2	ODU 7 pins female
COM3/4/USB	ODU 7 pins female
IN	ODU 7 pins female
OUT	ODU 5 pins female
Ethernet	ODU 4 pins female
Multi-purpose button	
Power button	

### 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.

**AsterRx2e** - Compact dual-frequency GPS/GLONASS receiver platform, offering top-quality GPS code and carrier phase data and dual-frequency positioning (including DGPS and L1/L2-RTK) at up to 25 Hz.

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

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

**PolaRx3e/3eG/3eTR** - A high-performance dual-frequency GNSS reference station and CORS receiver for precise positioning and navigation applications. Provides access to GPS (incl L2C) and GLONASS (PolaRx3e) or GPS and Galileo (PolaRx3eG), and is designed for time/frequency transfer applications (PolaRx3eTR).

**PolaNt\*** - A lightweight precise positioning and survey single or dual-frequency GPS or GPS/GLONASS 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 Septentrio receivers, for controlling the receiver, monitoring the navigation solution and accessing its functions in the same intuitive way as with RxControl.



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