

# AsteRx2eH™

## GPS/GLONASS Dual-frequency Heading receiver



*Single-board dual-frequency dual-antenna GPS/GLONASS heading receiver, specially designed for demanding machine control, marine survey and other multi-antenna applications.*

### Single-board dual-antenna GPS/GLONASS heading receiver

With two antenna inputs feeding 272 multi-frequency tracking channels, AsteRx2eH provides a compact and low power solution for cm-level RTK positioning combined with accurate heading information, at up to 20 Hz. AsteRx2eH tracks both GLONASS and GPS satellites, improving the availability and accuracy in challenging environments where signal blocking by buildings, trees, mountains and other obstructions provide limitations to GPS only systems.

### World-class performance with GNSS+

AsteRx2eH offers advanced signal processing for optimal performance under difficult conditions, including:

- Track+: for robust tracking of weak signals
- LOCK+™: provides stable tracking under high vibration and dynamic conditions
- APME+: Advanced code and phase multipath mitigation technology

### Easy to integrate

The AsteRx2eH is available as an OEM board for integration, or in a tough compact waterproof aluminium housing (AsteRx2eH PRO) for use in any outdoor environment. The RF section of board is shielded to help avoid EMI issues. The AsteRx2eH interface is fully documented providing the integrator with full flexibility. The interface is compatible with other receivers of the AsteRx2e-family making it easy to build solutions for different accuracy and application requirements with no redesign.

### A comprehensive GNSS SW-toolset

The RxTools package includes the intuitive RxControl GUI for receiver configuration and monitoring. Various tools for mission planning, data logging, replay and analysis, reporting, and more, are included.

## Key Features

- Single board dual-Antenna GPS/GLONASS receiver
- Precise heading calculation
- cm-level positioning accuracy
- Septentrio GNSS+ algorithms for robust industrial performance
- Easy to integrate, fully documented interface language
- A comprehensive GNSS SW-toolset



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# AsteRx2eH™

## GPS/GLONASS Dual-frequency Heading receiver

### 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 GPS and GLONASS satellite signals
- 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 fully documented 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

### 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	+ 5 VDC
Maximum current	200 mA
<b>Power consumption</b>	5 W typical
<b>Operating temperature</b>	-40 to +85 °C
<b>Storage temperature</b>	-40 to +85 °C
<b>Humidity</b>	5 % to 95 % (non condensing)

### Connectors

Antenna	2 x TNC female
10 MHz in	BNC female
PPS out	BNC female
Power	ODU 3 pins female
COM/USB	ODU 7 pins female
IN	ODU 7 pins female
OUT	ODU 5 pins female
Ethernet	ODU 4 pins female

### PERFORMANCE

#### Position accuracy<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
Veripos Ultra/APEX <sup>18</sup>	0.10 m	0.20 m
TERRASTAR D <sup>19</sup>	0.10 m	0.20 m

#### RTK performance<sup>1,14</sup>

Horizontal accuracy <sup>3</sup>	0.6 cm + 0.5 ppm
Vertical accuracy <sup>3</sup>	1 cm + 1 ppm
Average time to fix <sup>4</sup>	7 sec

#### Velocity Accuracy<sup>1,2,3</sup>

	Horizontal <sup>3</sup>	Vertical <sup>3</sup>
	0.8 cm/sec	1.3 cm/sec

#### Heading Accuracy

<b>1m antenna separation</b>	
Heading	0.3°
Pitch/Roll	0.6°
<b>10m antenna separation</b>	
Heading	0.03°
Pitch/Roll	0.06°

<b>Maximum Update rate</b>	20 Hz
<b>Latency</b>	< 20 msec

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

#### Tracking performance (C/N0 threshold)<sup>12,13,15</sup>

Tracking	26 dB-Hz
Acquisition	33 dB-Hz
Acceleration <sup>16</sup>	10 g
JerK <sup>17</sup>	4 g/sec

mate position known  
<sup>12</sup> 95%

<sup>13</sup> Max speed 600 m/sec

<sup>14</sup> Fixed ambiguities

<sup>15</sup> Depends on user settings of tracking loop parameters

<sup>16</sup> During acquisition

<sup>17</sup> During tracking

<sup>18</sup> Requires service activation from Veripos Ltd.

<sup>19</sup> Requires service activation from TERRASTAR.

<sup>1</sup> 1-20 Hz measurement rate

<sup>2</sup> Performance depends on environmental conditions

<sup>3</sup> 1σ level

<sup>4</sup> Baseline < 20 km

<sup>5</sup> C/N0 = 45 dB-Hz

<sup>6</sup> Smoothed

<sup>7</sup> Non-smoothed

<sup>8</sup> Multipath mitigation disabled

<sup>9</sup> Multipath mitigation enabled

<sup>10</sup> No information available (no almanacs, no approximate position)

<sup>11</sup> Ephemeris and approxi-



AsteRx2eH PRO



Integrator Kit

### AsteRx2eH OEM

### OTHER SEPTENTRIO PRODUCTS

**AsteRx-m** – Ultra low power, smaller than credit card GPS/GLONASS dual-frequency RTK receiver, for integration in hand-held devices, mobile computing platforms and other space-constrained applications requiring high accuracy and low-power consumption.

**AsteRx2e/2eL** – Compact dual-frequency GPS/GLONASS receiver platform, offering top-quality GPS code and carrier phase data and dual-frequency positioning (including DGPS, RTK and PPP (AsteRx2eL)) at up to 25 Hz.

**AsteRx3** – A Multi-frequency GPS/GLONASS/GALILEO receiver for demanding industrial applications, featuring precise RTK with extended baselines, advanced multipath and interference mitigation and exceptional tracking stability under high vibration conditions.

**AsteRxi** – 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.

**PolaRx4** – fully featured high performance GNSS receiver providing network operators and scientific users with high-quality tracking and measurement of all available and upcoming GNSS signals (GPS/GALILEO/GLONASS/COMPASS/SBAS)

**PolaRxS** – a multi-frequency multi-constellation receiver dedicated to ionospheric monitoring and space weather applications

**PolaNt-x** – A set of lightweight sturdy high precision antennas for geodetic, survey and machine control applications. Available in single-frequency GPS/GLONASS or multi-frequency GPS/GLONASS/GALILEO/COMPASS/L-Band variant, for use with the PolaRx and AsteRx receiver families.

**Choking MC** – A multi-frequency GPS/GLONASS/Galileo L1/L2/E5aAltBOC choking antenna for use with the PolaRx receiver family

**RxTools** – A suite of software applications for easy control of PolaRx and AsteRx receivers, and for easy manipulation, analysis and reporting of the data generated with these receivers

**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.



Versatile OEM Receivers for Demanding Applications