

## PolaRx2e

*The PolaRx2e receiver, the next generation receiver of the PolaRx2 receiver platform, is a versatile high-accuracy dual-frequency GNSS receiver for precise positioning and navigation applications, requiring single-board integrated GNSS-based devices. Designed for tough field conditions, it is built around Septentrio's advanced GNSS chipset and offers superior tracking sensitivity and high accuracy positioning information.*

### Performant GPS Receiver platform

Part of the same high performance platform as the PolaRx2, the new variant, PolaRx2e is a high-accuracy GPS receiver designed for professional OEM applications. The multi-purpose PolaRx2e receiver features reception of the L1 and L2 signals from up to 16 GPS satellites and features an optional built-in memory card for data storage. It provides users with the highest level of accuracy available for stand-alone and differential RTK/GPS positioning.

### GEO tracking for increased integrity

The PolaRx2e tracks the L1 signals from up to 6 SBAS augmentation satellites such as EGNOS and WAAS, offering your application vital integrity information and consequently increasing the confidence in the positioning solution and allowing utilisation in safety-critical environments.

### Exceptional Precision

Very low-noise Doppler measurements are key to exceptionally precise velocities and contribute to the high accuracy of the position. The PolaRx2e receiver has a high tracking sensitivity and stability of phase tracking, allowing users to track more satellites for a longer period of time, even under adverse conditions. PolaRx2e incorporates Septentrio's A Posteriori Multipath Estimator (APME), unique in its ability to tackle short-delay multipath, the most prevalent and damaging form in practical circumstances.

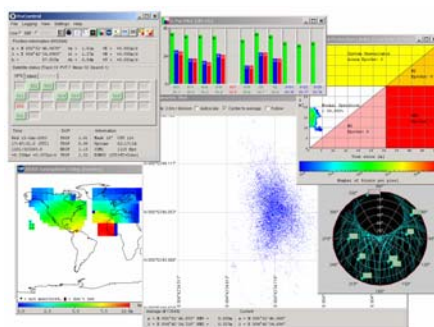
### Intuitive Graphical User Interface

As with all Septentrio GPS receivers, RxControl - an intuitive, Java-based GUI - can be used with the PolaRx2e for its configuration, for logging and remote control. RxControl includes advanced visualization features.



### Flexible Integration Options

The PolaRx2e receiver is available as a standard Euro card size board, ensuring easy integration. For ready-to-use solutions, the PolaRx2e comes in a waterproof IP65 rugged enclosure with sturdy connectors, allowing usage in tough and remote environments. The enclosed receiver offers 4 serial ports, a possibility of 256MB non-removable Compact Flash memory card and Ethernet access. New features include logging control via push button or external signals and programmable LEDs.



### Multi-functional Platform

The PolaRx2e receiver platform suits a variety of application needs, by allowing users to choose the required precision level - from decimetre level positioning to high-precision centimetre level Real-Time Kinematic (RTK) positioning. Other variants in the platform are multiple. The new dual-frequency dual-antenna heading variant, PolaRx2eH, is perfectly suitable for dual-antenna applications such as machine control. The multi-antenna variant, the PolaRx2e@, on the other hand, collects and outputs GPS data from up to 3 antennas simultaneously and as such forms a perfect receiver for attitude determination and other multi-antenna applications. Additionally, the platform features L2C (GPS civilian signal) tracking capability with the PolaRx2C family member.

# POLARX2E TECHNICAL SPECIFICATIONS

## FEATURES

- 48 hardware channels for "all in view" GPS+SBAS parallel tracking
- All channels configurable to track satellites in single or dual frequency
- Dual frequency L1/L2 code/carrier tracking
- Includes up to 6 SBAS channels (EGNOS, WAAS, other)
- Raw data output (code, carrier, SBAS navigation data)
- Up to 10 Hz raw measurement, position and attitude output rate (user selectable)
- A Posteriori Multipath Estimator technique (APME)
- Differential GPS (rover)
- x PPS output (x = 1, 2, 5, 10)
- 10 MHz reference input / output
- EGNOS and WAAS compatible
- Provision of protection levels in SBAS positioning mode (HPL/VPL)
- RAIM module included
- Four bi-directional serial ports (RS232), baudrate up to 115 kbps
- NMEA v2.30 output
- Highly compact and detailed Septentrio Binary Format (SBF) output
- 6 LEDs for power, logging, LAN link, Multi-purpose, tracking status and position fix identification
- Start and stop Data output/Logging on Event
- Compact single-board Euro card solution
- OEM board or mounted in IP65 waterproof enclosure
- Sturdy connectors
- Includes intuitive GUI (RxControl) and detailed operating and installation manual

## OPTIONS

- Differential GPS base station
- RTK (main antenna)
  - RTCM v2.2, 2.3 or 3.0 input/output
  - Reference Station Network compatible (FKP)
  - CMR 2.0
- 2 Event markers
- On Board Logging (non removable Compact Flash Memory Card)
- Programmable LEDs
- TCP/IP over Ethernet

## PERFORMANCE

Position accuracy <sup>1,2</sup>	Horizontal <sup>3</sup>		Vertical <sup>3</sup>
	Standalone	1.1 m	1.9 m
SBAS	0.7 m	1.2 m	
DGPS	0.6 m	1.1 m	
RTK performance <sup>1,5</sup>			
Horizontal accuracy <sup>3</sup>	1 cm + 1ppm		
Vertical accuracy <sup>3</sup>	2 cm + 2ppm		
Average time to fix <sup>5</sup>	7 sec		
Availability <sup>5</sup>	> 99,8 %		
Velocity Accuracy <sup>1,2</sup>			
Standalone	Horizontal <sup>3</sup> 1.5 mm/sec	Vertical <sup>3</sup> 2.8 mm/sec	
Maximum Update rate			
Latency	10 Hz < 50 msec		
Time accuracy <sup>1,2</sup>			
1PPS	20 nsec		
Measurement precision <sup>1,3,6</sup>			
C/A pseudoranges <sup>7</sup>	0.15 m (GPS) <sup>8</sup>	0.30 m (GPS) <sup>9</sup>	
	0.35 m (SBAS)		
P1/P2 pseudoranges <sup>7</sup>	0.1 m		
L1 carrier phase	0.2 mm		
L2 carrier phase	1 mm		
L1/L2 doppler	2.5 mHz (0.5 mm/sec)		
Time to first fix			
Cold start <sup>10</sup>	< 90 sec		
Warm start <sup>11</sup>	After power-on	< 55 sec	
	After reset	< 20 sec	
Re-acquisition	< 2 sec		
Tracking performance (C/N <sub>0</sub> threshold) <sup>12,13</sup>			
Code phase tracking	19 dB-Hz		
Carrier phase tracking	26 dB-Hz		
Acquisition	33 dB-Hz		
Acceleration	4 g		
Jerk	3 g/sec		

1 1 Hz measurement rate  
 2 Performance depends on environmental conditions  
 3 1σ level  
 4 Fixed ambiguities  
 5 Baseline < 20 km  
 6 C/N<sub>0</sub> = 45 dB-Hz  
 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 515 m/sec, max altitude 18 000 m



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## PHYSICAL AND ENVIRONMENTAL

Size	160 x 100 x 13 mm (OEM board) 285 x 140 x 37 mm (In housing)
Weight	120 g (OEM board) 930 g (In housing)
Input voltage	5 VDC ± 5% (OEM board) 9-30 VDC (In housing)
Antenna LNA Power Output	Output voltage + 5VDC Maximum current 200 mA
Power consumption	5 W typical, 7W max
Operating temperature	-30 to +70 °C
Storage temperature	-40 to +85 °C
Humidity	5% to 95% (non condensing)
Connectors	Antenna TNC female 10 MHz in BNC female PPS out BNC female
OEM board	Backplane DIN 41612 type B, 64 pins male (consult Septentrio)
Extension	
Housing	Power ODU 3 pins female COM1 ODU 7 pins female COM2 ODU 7 pins female OUT/COM3&4 ODU 5 pins female IN ODU 7 pins female Ethernet ODU 4 pins female Multi-purpose button Power button

## POLARX2E FAMILY : OTHER PRODUCTS

**PolarX2e\_SBAS** - The single-frequency variant tracks up to 6 SBAS augmentation satellites (such as EGNOS and WAAS) in addition to GPS satellites, offering vital integrity information for application in safety-critical environments.

**PolarX2eH** - A unique single-board dual-frequency dual-antenna receiver - suitable to being connected to 2 dual-frequency antennas, brings heading and machine control applications within economic and practical reach.

**PolarX2e@** - A unique single-board dual-frequency receiver that can be connected to up to 3 antennas, for various 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.

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

SSNDS 02/2006/1

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