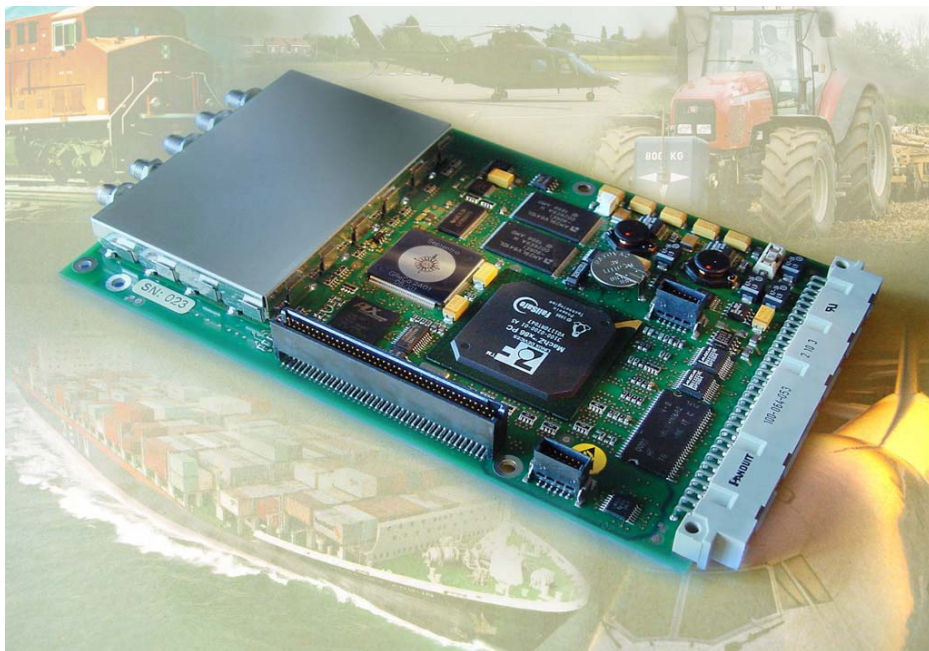


PolaRx2@

PolaRx2@ is a versatile dual-frequency GNSS receiver that can be connected to up to 3 antennas. As part of the PolaRx2 family of high-end satellite navigation receivers, it uses the same advanced GNSS chipset and original tracking and positioning algorithms, resulting in the same low noise performance and high tracking stability. Implemented on a single Euro-card size board, it brings heading/attitude and other multi-antenna applications within economical and practical reach.



Precise Heading and Attitude at 10 Hz

PolaRx2@ builds on the quality and flexibility of the PolaRx2 GNSS platform to provide precise heading, pitch and roll as well as accurate position and velocity at update rates of up to 10 Hz.

The high accuracy, full set of functions, flexibility, and compact form factor, make the PolaRx2@ receiver an ideal solution for marine survey, compass calibration, dredging, airborne photogrammetry and machine guidance solutions in agriculture and construction.

Unique and Versatile Single-Board Receiver

PolaRx2@ is the only compact single-board attitude receiver on the market. The small form factor, low weight, versatility and affordability brings important improvements in traditional heading/attitude applications but also opens possibilities for applications that were hitherto unfeasible. PolaRx2@ can be connected to up to 3 antennas : the main antenna can be dual-

frequency, the auxiliary antennas are single-frequency. Its 48 hardware channels can be flexibly assigned to track satellites in single or dual frequency on 1, 2 or 3 antennas in parallel (i.e. without antenna multiplexing). One or more of the channels can also be used to track SBAS augmentation satellites.

The receiver cannot only be used with a rigid antenna set-up to determine the classical heading or attitude angles. In situations where the relative positions of the antennas are not fixed, PolaRx2@ will determine and output these relative positions precisely.

High-Performance GNSS engine

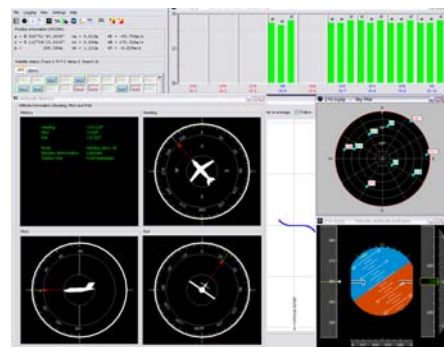
PolaRx2@ is part of the PolaRx2 family of high-end dual-frequency OEM GNSS receivers. It is built around Septentrio's GReFE® front-end and GReCo® GPS/SBAS baseband processor chips.

Users get the highest level of accuracy available for stand-alone and differential GPS positioning. Very low-noise Doppler

measurements are the key to exceptionally precise velocities and contribute to the high accuracy of the position. PolaRx2@ furthermore has a very high tracking sensitivity and exceptional stability of phase tracking, allowing users to track more satellites for a longer period of time, even under adverse conditions. And the patent pending mitigation technique APME, which is particularly effective in addressing short-delay multipath, is included in all receivers.

Ease of Use and Integration

PolaRx2@ is available as a standard Euro-card-size board or packaged in a rugged enclosure. An optional extension board for PC-cards (formerly PCMCIA) can be used for instance for a CompactFlash memory card or for Ethernet access.



PolaRx2@ is accompanied by RxControl, the powerful Graphical User Interface program which offers intuitive access to all functions and data from the receiver and allows easy data-logging.

Results can be output via both industry-standard NMEA-0183 messages and a compact binary format. And as always a complete detailed manual accompanies the receiver.

POLARX2@ 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 on 1, 2 or 3 antennas in parallel (i.e. without antenna multiplexing)
- Dual frequency L1/L2 code/carrier tracking
- Includes 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)
- Automatic or manual antenna calibration
- Attitude and antenna position output
- A Posteriori Multipath Estimator technique (APME)
- Differential GPS (rover)
- x PPS output (x = 1, 2, 5, 10)
- 10 MHz reference input / output
- RAIM module included
- Two bi-directional serial ports (RS232), baudrate up to 115 kbps
- NMEA v2.30 output
- Highly compact and detailed Septentrio Binary Format (SBF) output
- 3 LEDs/pins for power, logging, tracking status and position fix identification
- Compact single-board Eurocard solution
- OEM board or mounted in sturdy enclosure
- Industry standard backplane connector
- Includes intuitive GUI (RxControl) and detailed operating and installation manual

OPTIONS

- Differential GPS base station (main antenna)
- RTK (main antenna)
 - RTCM v2.2 or 2.3 input/output
 - Reference Station Network compatible (FKP)
 - CMR
- 2 Event markers
- PC-card slot for extension board, allowing
 - TCP/IP over Ethernet
 - Data logging on removable CompactFlash Memory
 - GPRS*

PERFORMANCE

Position accuracy^{1,2}		
	Horizontal ³	Vertical ³
Standalone	1.1 m	1.9 m
SBAS	0.7 m	1.2 m
DGPS	0.6 m	1.1 m
RTK ^{4,5}	1 cm + 1ppm	2 cm + 2ppm
Velocity Accuracy^{1,2}		
	Horizontal ³	Vertical ³
Standalone	1.5 mm/sec	1.9 mm/sec
Attitude accuracy^{1,2,14}		
1 m antenna separation		
Heading		0.3°
Pitch/Roll		0.6°
3 m antenna separation		
Heading		0.1°
Pitch/Roll		0.2°
10 m antenna separation		
Heading		0.03°
Pitch/Roll		0.06°
Auxiliary Antenna positions¹⁵		0.6 mm
Maximum Update rate		10 Hz
Latency		< 50 msec
1PPS Accuracy^{1,2}		10 nsec
Measurement precision^{1,3,6}		
C/A pseudoranges⁷		0.15 m (GPS) ⁸
		0.30 m (GPS) ⁹
		0.35 m (SBAS)
P1/P2 pseudoranges⁷		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 start¹⁰		< 90 sec
Warm start¹¹		< 55 sec
After power-on		< 20 sec
After reset		2.5 sec
Re-acquisition		45 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		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/N₀ = 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
 14 Attitude accuracy increases linearly with antenna separation
 15 No multipath

PHYSICAL AND ENVIRONMENTAL

Size	178 x 100 x 13 mm (OEM board) 230 x 140 x 37 mm (In housing)
Weight	120 gr (OEM board) 720 gr (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	
Antennas	SMA female
10 MHz in/out	SMA female
OEM board	
Backplane	DIN 41612 type B, 64 pins male (consult Septentrio)
Extension	
Housing	
Power	LEMO 0B series, 3 pins
Com 1 & 2	9-pin male sub-D
General purpose	ERNI SMC type B right angle male

POLARX2 FAMILY : OTHER PRODUCTS

PolarX2 and PolarX2OEM - PolarX2 is a versatile dual frequency GNSS receiver platform for high-end applications. Based on code and carrier tracking of the L1 and L2 signals, it provides the user with satellite range measurements and position, velocity and time.

PolarX2SBAS - PolarX2SBAS is a single-frequency receiver that tracks up to 6 SBAS augmentation satellites (such as EGNOS and WAAS) in addition to GPS satellites, increasing the accuracy of the position and offering your application vital integrity information increasing the confidence in the position solution for application in safety-critical environments.

PolarX2TR - PolarX2TR (Timing/Reference) combines world-class performance in terms of measurement noise, sensitivity and tracking stability with user-oriented features such as Ethernet communication. PolarX2TR also provides specific GPS timing functions (1PPS in and out).

RxControl - RxControl is an intuitive user interface to configure and control all types of PolarX2 receivers and monitor, log and post data remotely.

* planned 2005