

PolaRx3eG:GPS Galileo L1L5/E5a

PolaRx3eG is the latest receiver in the PolaRx family of versatile high-accuracy dual-frequency GNSS receivers for precise positioning and navigation applications. It provides access to the new Galileo and modernised GPS signals and offers users the opportunity to track the new signals as they become available. Next to high-quality Galileo and GPS measurements, it provides an attractive reference station and field data logging platform for existing users of PolaRx2e as well as for new users, while maintaining the same tough housing, interfaces and features as internal data logging, event markers and others.

High-quality GPS/Galileo Dual-frequency Receiver platform

Member of the same high performance family as the PolaRx2e, the new variant, PolaRx3eG is a high-accuracy GPS/Galileo receiver built around the 136 channel multi frequency multi constellation GReCo3 ASIC, designed for professional reference station and field data logging applications focussing on Galileo + GPS L5 signals. PolaRx3eG can have its 136 hardware channels assigned to GPS and Galileo reception of the L1 and L5/E5a signals (incl GIOVE-A, GIOVE-B). Additionally PolaRx3eG can receive 3 SBAS channels and features an optional built-in memory card for data storage. It provides users with the highest level of measurements and accuracy available. An upgrade is available to enable L2 tracking, making the receiver switchable between L1/L5/E5a GPS/Galileo and L1/L2 GPS/GLONASS operation.

Geodetic grade performance

PolaRx3eG features a powerful fast acquisition unit (FAU) which incorporates thousands of parallel correlators bringing the acquisition time



of Galileo signals from minutes to less than 2 seconds. In addition our Pilot tone tracking yields a more robust tracking, lower noise and less cycle slips resulting in high quality raw data as well as positioning in various modes.

PolaRx3eG incorporates Septentrio's patented A Posteriori Multipath Estimator (APME), unique in its ability to tackle short-delay multipath, the most prevalent and damaging form in practical circumstances. APME is effective on both GPS and GALILEO. Of vital importance for continuously operating reference stations, is the excellent stability of the PolaRx3eG software.

Networking and Remote Operation

Communication with PolaRx3eG is easy

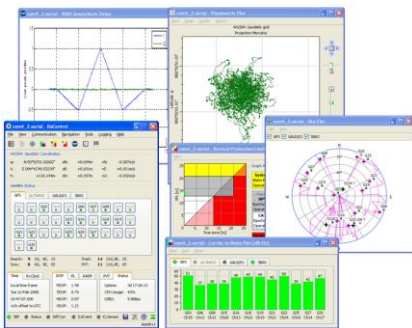
with TCP/IP access over Ethernet. Full remote control of the receiver is possible through this Ethernet port, including real-time receiver monitoring.

Sturdy and flexible field unit

PolaRx3eG is integrated in a waterproof IP65 rugged enclosure with sturdy connectors, allowing usage in tough and remote environments. The enclosed receiver also offers 2 serial ports and USB, and includes optional 2GB internal data storage. Data logging is ensured even when incorrectly stopped, e.g. in case of power failure. Logging can be controlled via a push button.

Multi-functional Platform

PolaRx3eG suits a variety of application needs, by allowing users to choose the required operational mode.



FEATURES

- Dual-frequency L1/L5/E5a code/carrier tracking of GPS and GALILEO signals.
- 136 hardware channels for simultaneous tracking of all visible satellites in GPS and GALILEO constellations
- Raw data output (code, carrier, SBAS navigation data)
- Up to 20 Hz raw measurement and PVT output rate (user selectable)
- A Posteriori Multipath Estimator technique (APME)
- 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
- Two bi-directional serial ports (RS232), baudrate up to 230 kbps
- 1 full speed USB port
- 1 Ethernet port
- On Board Logging (2GB)
- 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
- Mounted in IP65 waterproof enclosure with sturdy connectors
- Includes intuitive GUI (RxControl) and detailed operating and installation manual
- 2 Event markers

OPTIONS

- Upgradable to:
 - Modernized GPS (L2C) support
 - GLONASS-M support on both L1 and L2 (Switchable between L2/L5)
- RTK
 - RTCM v2.2, 2.3, 3.0 or 3.1 input/output
 - Reference Station Network compatible (FKP)
 - CMR 2.0 and CMR+

SUPPORTED STANDARDS

- Galileo Open Services, OS SIS ICD Draft1, Feb 2008
- GPS L5 SIS ICD (ICD-GPS-705) of 02-DEC-2002

PERFORMANCE

Position accuracy ^{1,2,3,6}		
	Horizontal	Vertical
Standalone	1.3 m	1.9 m
SBAS	0.6 m	0.8 m
DGPS	0.5 m	0.9 m
Velocity Accuracy ^{1,2,3}		
	Horizontal ³	Vertical ³
Standalone	0.8 cm/sec	1.3 cm/sec
Maximum Update rate		
		20 Hz
Latency		
		< 20 msec
Time accuracy ³		
1PPS		10 nsec
Event accuracy		< 10 nsec
Measurement precision ^{1,3,5}		
C/A pseudoranges		5 cm (GPS) ⁶
		0.16 m (GPS) ^{7,8}
		0.20 m (GPS) ^{7,9}
E1 pseudoranges		8 cm (GALILEO) ^{7,8}
L5/E5a		6 cm (GALILEO) ^{7,8}
GPS P1pseudoranges ⁷		0.1 m
L1 carrier phase		1 mm
L5/E5a carrier phase		1.3 mm
L1/L5 doppler		0.1 Hz
Time to first fix		
Cold start ¹⁰		< 45 sec
Warm start ¹¹		< 20 sec
Re-acquisition		avg 1.2 sec
Tracking performance (C/N₀ threshold) ^{12,13,15}		
Tracking		26 dB-Hz
Acquisition		33 dB-Hz
Acceleration ¹⁶		10 g
Jerk ¹⁷		4 g/sec

- 1 Hz measurement rate
- 2 Performance depends on environmental conditions
- 3 1 σ level
- 4 Baseline < 20 km
- 5 C/N₀ = 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

Size	285 x 140 x 37 mm (In housing)
Weight	930 g (In housing)
Input voltage	9-30 VDC (In housing)
Antenna LNA Power Output	
Output voltage	+ 5VDC or ext.
Maximum current	200 mA
Power consumption	4.5W typ
Operating temperature	-40 to +70 °C
Storage temperature	-40 to +85 °C
Humidity	5% to 95% (non condensing)
Connectors	
Antenna	TNC female
10 MHz in	BNC female
10 MHz out	BNC female
PPS out	BNC female
Power	ODU 3 pins female
COM1	ODU 7 pins female
COM2	ODU 7 pins female
USB	ODU 5 pins female
IN	ODU 7 pins female
Ethernet	ODU 4 pins female
Multi-purpose button	
Power button	

OTHER SEPTENTRIO PRODUCTS

AsteRx1 - 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.

AsteRx2 - 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 20 Hz.

PolaRx2eH and PolaRx2e@ - A unique single-board dual-frequency multi-antenna receiver that can be connected to 2, respectively 3 antennas, for various machine control, heading/attitude and other multi-antenna applications.

PolaRx3e - A versatile high-accuracy dualfrequency 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).

PolaRx3eTR - A high-performance integrated dual-frequency GNSS Timing/Reference receiver.

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. RxMobile allows controlling the receiver, monitoring the navigation solution and accessing its functions in the field in the same intuitive way as with RxControl.

Specifications subject to change without notice. Some features or specifications may not apply to all models.

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