

## PolaRx3 / PolaRx3TR: GPS/GLONASS Dual-frequency Receivers.

*The PolaRx3 receiver family of high-performance dual-frequency GNSS receivers provides high-quality GPS measurements, GLONASS dual-frequency data as well as modernized GPS (L2C). They also bolster support for the new GALILEO signals as well as for Timing/Reference applications. Available in the same sturdy housing as their predecessor, with the same interfaces and features as internal data logging, event markers and others, they provide an attractive upgrade station and field data logging platform for existing PolaRx2e users as well as for new users.*

### High-quality GPS/GLONASS Dual-frequency Receiver platform

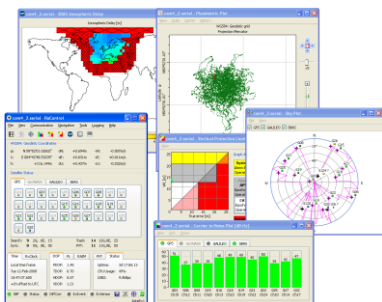
PolaRx3 is a high-accuracy GPS/GLONASS receiver designed for professional reference station and field data logging applications. PolaRx3 features reception of the L1 and L2 signals from up to 24 GPS or GLONASS satellites (including GLONASS-M) and features an optional built-in memory card for data storage.

A powerful fast acquisition unit and enhanced codeless tracking of L1 and L2 signals on 66 channels, yields best-in-class, low noise data quality even under Anti-Spoofing. High quality raw data as well as positioning in various modes is offered.

PolaRx3 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 GLONASS.

### PolaRx3TR Timing Receiver

PolaRx3TR, a special variant of PolaRx3 accepts an external 10 MHz frequency reference and 1PPS input to precisely synchronize the GNSS measurements with an external frequency and time



standard, making PolaRx3TR perfectly suited for frequency and time transfer applications. Moreover, PolaRx3TR is the only receiver that does not suffer from multiple instability regions in PPS input phase, greatly simplifying the installation of the receiver in a time laboratory.

### Sturdy and flexible field unit

PolaRx3 and PolaRx3TR are integrated in a waterproof IP65 rugged enclosure with sturdy connectors, for use in tough and remote environments. The receivers also offer ethernet, serial ports and USB, and include optional 1GB 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 or external signals.

RxControl provides full remote control of the receiver including real-time receiver monitoring and data downloading, data logging, firmware upgrade and option management.

### Multi-functional Platform

PolaRx3 suits a variety of application needs, offering high quality measurements as well as allowing users to choose the required precision level - from decimetre level positioning to high-precision centimetre level Real-Time Kinematic (RTK) positioning.

# POLARX3 / POLARX3TR TECHNICAL SPECIFICATIONS

## FEATURES

- Dual-frequency L1/L2 code/carrier tracking of GPS and GLONASS signals.
- 66 hardware channels for simultaneous tracking of all visible satellites in GPS and GLONASS constellations
- Up to 20 Hz raw measurement and PVT output rate (user selectable)
- Modernized GPS (L2C) support
- A Posteriori Multipath Estimator technique (APME)
- Differential GPS (base station and rover)
- Includes up to 3 SBAS channels (EGNOS, WAAS, other)
- x PPS output (x = 1, 2, 5, 10)
- 10 MHz reference input / output
- GLONASS-M support on both L1 and L2
- Provision of protection levels in SBAS positioning mode (HPL/VPL)
- 2 Event markers
- RAIM module included
- Raw data output (code, carrier, SBAS navigation data)
- Two bi-directional serial ports (RS232), baudrate up to 230 kbps
- 1 full speed USB port
- 1 Ethernet port
- On Board Logging (1GB)
- Highly compact and detailed Septentrio Binary Format (SBF) output
- NMEA v2.30 output
- 6 LEDs for power, logging, LAN link, Multi-purpose, tracking status and position fix identification
- Start and stop Data output/Logging on Event
- Mounted in IP65 waterproof enclosure with sturdy connectors
- Includes intuitive GUI (RxControl) and detailed operating and installation manual

## OPTIONS

- RTK
  - RTCM v2.2, 2.3, 3.0 or 3.1 input/output
  - Reference Station Network compatible (FKP)
  - CMR 2.0 and CMR+
- 1PPS-in function (PolarX3TR)

## PERFORMANCE

<b>Position accuracy</b> <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
<b>RTK performance</b> <sup>1,14</sup>		
Horizontal accuracy <sup>5</sup>		1 cm + 1ppm
Vertical accuracy <sup>3</sup>		2 cm + 2ppm
Average time to fix <sup>4</sup>		7 sec
<b>Velocity Accuracy</b> <sup>1,2,3</sup>		
	Horizontal <sup>3</sup>	Vertical <sup>3</sup>
Standalone	0.8 cm/sec	1.3 cm/sec
<b>Maximum Update rate</b>		
Latency		< 20 Hz
		< 20 msec
<b>Time accuracy</b> <sup>3</sup>		
1PPS-out		10 nsec
Event accuracy		< 10 nsec
<b>Measurement precision</b> <sup>1,3,5</sup>		
C/A pseudoranges		5 cm (GPS) <sup>6</sup>
		0.16 m (GPS) <sup>7,8</sup>
		7 cm (GLONASS) <sup>6</sup>
		0.25 m (GLONASS) <sup>7,8</sup>
GPS P2 pseudoranges <sup>7</sup>		0.1 m
GLONASS P pseudoranges <sup>7</sup>		0.1 m
L1 carrier phase		1 mm
L5/E5a carrier phase		1.5 mm
L1/L2 doppler		0.1 Hz
<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
<b>Tracking performance (C/N<sub>0</sub> threshold)</b> <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

- 1 1 Hz measurement rate
- 2 Performance depends on environmental conditions
- 3 1 $\sigma$  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>Size</b>	285 x 140 x 37 mm
<b>Weight</b>	930 g
<b>Input voltage</b>	9-30 VDC
<b>Antenna LNA Power Output</b>	
Output voltage	+ 5VDC or ext.
Maximum current	200 mA
<b>Power consumption</b>	
	5W typ
<b>Operating temperature</b>	
	-40 to +70 °C
<b>Storage temperature</b>	
	-40 to +85 °C
<b>Humidity</b>	
	5% to 95% (non condensing)
<b>Connectors</b>	
Antenna	TNC female
10 MHz in	BNC female
PPS out (PolarX3 TR Only)	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	

**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.

**PolarX3G** - A high-performance integrated dual-frequency GNSS receiver that provides access to the new and upcoming Galileo signals. The modernized GPS signals are also supported.

**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.

**PolarNt\*** - 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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