PolaRx5
Multi-frequency GNSS Reference Receiver

septentrio

Key Features

▶ **Tracks all visible GNSS signals (GPS, GLONASS, Galileo, BeiDou, IRNSS)**

▶ **High precision, low noise measurements**

▶ **Unique interference monitoring**

▶ **Powerful web interface and logging tools**

▶ **Rugged housing and multiple interfaces**

▶ **Up to 8 independent logging sessions**

▶ **Logging both internally and to an external device**

PolaRx5 is a versatile and robust multi-frequency GNSS reference receiver. The unique design of its tracking provides measurements with the lowest noise on the market while constantly monitoring and protecting against ionospheric interference, multipath and other environmental effects.

Tracking of all visible signals
PolaRx5 features simultaneous high-quality tracking of all visible signals (L1, L2, L5, E5ab/AltBOC B3/E6 GPS/GLONASS/Galileo/Beidou/IRNSS, SBAS) at low noise levels.

The PolaRx5 provided the fewest number of cycle slips while offering the highest amount of observations per slip according to independent competitive tests.

GNSS+™ technology
The A Posteriori Multipath Estimator, unique in its ability to tackle short-delay multipath, enhances the measurement quality while LOCK+ tracking guarantees robust tracking of rapid signal dynamics during scintillation events or earthquakes. Advanced interference analysis and adaptive mitigation using proprietary filtering facilitates use in difficult radio environments around airports or in the neighborhood of chirp jammers.

Networking, remote operation, and data logging
Communication and (remote) management of the PolaRx5 is made easy with a powerful built-in web interface, which features secured access to all receiver settings and status information, data storage, and fast and robust firmware upgrading. SBF and RINEX data logging is possible on both a built-in 16GB memory and on an externally connected device. Up to 8 separate logging sessions can be defined. Logged data can be accessed through the built-in FTP server or automatically pushed to a FTP server.

Any device, any platform
Use any device with a web browser to operate the PolaRx5 via the built-in web server accessible over WIFI, ethernet or USB. PolaRx5 comes with RxTools, a suite of applications that complements the web interface with advanced display and analysis tools. RxTools is available for Windows and Linux.

PolaRx5

FEATURES

GNSS Technology

544 hardware channels for simultaneous tracking of all visible satellite signals

Supported signals: GPS (L1, L2, L5), GLONASS (L1,L2,L3) GALILEO (E1, E5ab, AltBoc, E6), BEIDOU (B1, B2, B3), IRNSS (L5), QZSS (L1, L2, L5) (Galileo, BeiDou and IRNSS are optional features)

All-in-view SBAS (EGNOS, WAAS, GAGAN, MSAS, SDCM) (incl. L5 tracking)

Up to 100Hz Raw data output (code, carrier, navigation data) (optional feature)

A Posteriori Multipath Estimator (APME+) including code and phase multipath mitigation

AIM+/WIMU interference mitigation unit, including chirp jammers

Scalable Power Consumption

All multipath mitigation and smoothing algorithms can be disabled

Spectrum analyzer

RTK & DGNSS Base (optional feature)

Formats

RTCM v2.2, 2.3, 3.0 or 3.1 (All MSM messages supported)

CMR 2.0

Highly compact and detailed Septentrio Binary Format (SBF) output

NMEA v2.30 and v4.10 output format

Includes intuitive GUI (RxControl, web interface and RxTools) and detailed operating and installation manual

Support for standard MET/Tilt sensors

Connectivity

x PPS output (max 100Hz)

10 MHz reference input

4 hi-speed serial ports

1 Ethernet port (100MBps)

Integrated Wi-Fi (802.11 b/g/n)

Power-Over-Ethernet

1 full speed USB port

1 USB host for external disk

16 GB standard on-board logging

Up to 8 simultaneous logging sessions

Advanced web interface providing all receiver controls, status monitoring, ftp server, ftp push

Ntrip server and client

Convenient TCP/IP socket interface for easy integration with your software applications

PERFORMANCE

Measurement precision[1,2,3]

C/A pseudoranges	5 cm (GPS)[4]
	0.16 m (GPS)[5,6]
	7 cm (GLO)[4]
	0.25 m (GLO)[5,7]
E1 pseudoranges	8 cm (GALILEO)[5,6]
L5/E5ab	6 cm (GALILEO)[5,6]
E5 AltBOC	1.5 cm (GALILEO)[5,6]
E6 pseudoranges	7 cm (GALILEO)[5,6]
GPS P2 pseudoranges[5]	0.1 m
GLONASS P pseudoranges[5]	0.1 m
B1/B2 pseudoranges	8 cm (BEIDOU)[5,6]
B3 pseudoranges	6 cm (BEIDOU)[5,6]
IRNSS L5 pseudoranges	16 cm
L1 carrier phase	1 mm
L2 carrier phase	1 mm
L5/E5 carrier phase	1.3 mm
E6/B3 carrier phase	1 mm
L1/L2/L5 doppler	0.1 Hz
B1/B2 doppler	0.1 Hz
E6/B3 carrier phase	0.1 Hz

Update rate

Measurements	100 Hz
Position	1 Hz

Time accuracy[2]

1PPS	10 ns
Event	20 ns

Time to first fix

Cold start[8]	< 45 s
Warm start[9]	< 20 s
Re-acquisition	avg 1.2 s

Tracking performance (C/N0 threshold)[10,11,12]

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

PHYSICAL AND ENVIRONMENTAL

Size	235 x 140 x 37 mm
Weight	880 g
Input voltage	9 – 30 VDC

Antenna LNA Power Output

Output voltage	+5 VDC
Maximum current	200 mA

Power Consumption	1.7 – 5 W

Operating temperature	-40 °C to +65 °C
Storage temperature	-40 °C to +85 °C

Connectors

Antenna	TNC female
Ref in/out	BNC female
1PPS out	BNC female
Power	ODU 3 pins female
COM1	ODU 7 pins female
COM2	ODU 7 pins female
COM3/4/USB	ODU 7 pins female
USB Host	ODU 5 pins female
IN	ODU 7 pins female
OUT	ODU 5 pins female
Ethernet	ODU 4 pins female
WIFI-Antenna	SMA female

[1] 1 Hz measurement rate

[2] 1σ level

[3] C/N0 = 45 dB-Hz

[4] Smoothed

[5] Non-smoothed

[6] Multipath mitigation disabled

[7] Multipath mitigation enabled

[8] No information available

  (no almanacs, no approximate position)

[9] Ephemeris and approximate position known

[10] 95%

[11] Max speed 600 m/s

[12] Depends on user settings of tracking loop parameters