PolaRx5

Multi-frequency GNSS Reference Receiver

septentrio

Key Features

- **Tracks all visible GNSS signals: GPS, GLONASS, Galileo, BeiDou, IRNSS, QZSS and SBAS**
- **High-precision, low-noise measurements**
- **Best in class interference monitoring and mitigation**
- **Low and scalable power consumption**
- **Powerful Web UI and logging tools**
- **Rugged housing with multiple interfaces**
- **Logging up to 24 parallel data records**
- **Logging both internally and to an external device**

The PolaRx5 is a versatile and robust multi-frequency GNSS reference receiver. Its unique design provides measurements with the lowest noise and cycle slip rate on the market while continously monitoring and protecting against interference, multipath and other environmental effects.

Tracking all visible signals

The PolaRx5 tracks all visible signals generating ultra low-noise measurements. According to independent competitive tests, the PolaRx5 provided the fewest cycle slips while offering the highest number of observations per slip.

GNSS+™ technology

The A Posteriori Multipath Estimator (APME+), unique in its ability to tackle short-delay multipath, enhances measurement quality while LOCK+ guarantees robust tracking of rapid signal dynamics during scintillation events or earthquakes. Advanced interference analysis and adaptive mitigation (AIM+) using proprietary filtering keeps you working in difficult radio environments for example in the vicinity of airports or chirp jammers.

Networking, remote operation and data logging

Communication and (remote) management of the PolaRx5 is made easy with a powerful built-in Web UI which features secured access to all receiver settings and status information, data storage, and fast firmware upgrading.

SBF, RINEX and BINEX data logging is possible on both the built-in 16GB memory and on an externally connected device. Up to 24 data records can be defined: 8 independent sessions with 3 data formats per session. Logged data can be accessed via the Web UI or automatically pushed to a FTP server.

Any device, any platform

Use any device with a web browser to monitor and configure the PolaRx5 via the built-in webserver accessible over WiFi, network or USB connection. The PolaRx5 comes with RxTools: a suite of applications that complements the Web UI with advanced monitoring, conversion and analysis tools.

PolaRx5

FEATURES

GNSS Technology

544 hardware channels for simultaneous tracking of all visible satellite signals

Supported signals: GPS (L1P,L1CA, L2, L5), GLONASS (L1,L2,L3) GALILEO (E1, E5ab, AltBoc, E6), BEIDOU (B1, B2, B3), SBAS (L1, L5), IRNSS (L5), QZSS (L1, L2, L5) (Galileo, BeiDou and IRNSS are optional features)

P-code tracking on L1 and L2 to avoid CA-P biases

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

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

AIM+ interference unit mitigates against wide and narrow-band interference

Spectrum analyser

All multipath mitigation and smoothing algorithms can be enabled/disabled

Scalable power consumption

RTK and DGNSS corrections (optional feature)

PPP for seismic applications (optional feature)

Formats

Septentrio Binary Format (SBF), fully documented with sample parsing tools

RINEX (obs, nav, meteo) v2.x, 3.x

BINEX

NMEA v2.30 and v4.10 output

RTCM output (All MSM messages supported)

CMR 2.0 output

Support for standard MET/Tilt sensors

Connectivity

10 MHz reference input

10 MHz reference output

x PPS output (max 100Hz)

4 hi-speed serial ports

1 Ethernet port (100MBps)

Integrated WiFi (802.11b/g/n)

Power-Over-Ethernet

1 full speed USB port

1 USB host socket for external disk

16 GB standard on-board logging

Up to 24 logging sessions

Advanced Web UI providing all receiver controls, and status monitoring

FTP server, FTP push, SFTP

Ntrip (server, client, caster)

RxTools, intuitive GUI tools for receiver monitoring and data conversion and analysis

PERFORMANCE

Measurement precision [1,2,3]

Unsmoothed pseudoranges (cm)[4]

GPS	L1C/A, L2C	16
	P code	10
	L5	6
GLONASS	L1 C/A, L2 C/A	25[5]
	P code	10
Galileo	E1	8
	E5a, E5b	6
	E5AltBOC	1.5
	E6	7
BeiDou	B1/B2	8
	B3	6
IRNSS	L5	16
QZSS	L1 C/A, L2C	16
	L5	6

Carrier Phase	1 - 1.3 mm

Update rate

Measurements	100 Hz

Time accuracy

1PPS out	5 ns
1 PPS out rise time	< 2 ns
Event	< 20 ns

Time to first fix

Cold start[6]	< 45 s
Warm start[7]	< 20 s
Re-acquisition	avg 1.2 s

Tracking performance (C/N0 threshold)[8,9]

Tracking	20 db-Hz
Acquisition	33 db-Hz

PHYSICAL AND ENVIRONMENTAL

Size	235 x 140 x 37 mm (9.25 x 5.51 x 1.45 in)
Weight	900 g (1.98 lb)
Input voltage	9 – 30 VDC
Power Consumption	1.85-4.7 W

Antenna LNA Power Output

Output voltage	+5 VDC
Maximum current	200 mA

Operating temperature	-40 °C to +65 °C (-40 °F to +149 °F)
Storage temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Humidity	5 % to 95 % (non-condensing)

Connectors

Antenna	TNC female
REF IN	BNC female
REF OUT	BNC female
PPS 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

Certification	IP65, RohS, CE FCC Class B Part 15

1 1 Hz measurement rate

2 1σ level

3 C/N0 = 45 dB-Hz

4 Multipath mitigation disabled

5 Multipath mitigation enabled

6 No information (almanac, approx. position) available

7 Ephemeris and approximate position known

8 Max speed 600 m/s

9 Depends on user settings of tracking loops parameters

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