



Key Features

- ▶ **Tracking of all visible signals**
- ▶ **Ultra-low measurement noise**
- ▶ **Output of IQ samples up to 100Hz**
- ▶ **Convenient web interface and logging tools**
- ▶ **Rugged housing and multiple interfaces**

For more information contact

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The PolaRxS is a multi-frequency, multi-constellation receiver dedicated to ionospheric monitoring and space weather applications designed around Septentrio's latest tracking engine and an ultra-low noise Oven-Controlled Crystal Oscillator (OCXO).

Tracking of all visible signals

The PolaRxS features simultaneous high-quality tracking of all visible signals (L1, L2, L5, E5ab/AltBOC GPS/GLONASS/Galileo/Beidou/SBAS) at unbeaten low noise levels.

Output of IQ samples with ultra-low measurement noise

The receiver outputs an extensive set of GNSS measurements, including signal phase and intensity at up to 100 Hz, with a phase noise standard deviation (ϕ_{60}) as low as 0.03 rad.

GNSS+™ technology

The A Posteriori Multipath Estimator (APME+), 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. Advanced interference analysis and mitigation using notch filtering facilitates use in difficult radio environments.

Convenient GUI and logging tool

The included tools provide continuous TEC and scintillation indices logging for space weather and ionosphere monitoring (S4, f_{min}), spectral slope and SI indexes for all satellite constellations and frequency bands).

Rugged housing and multiple interfaces

The robust waterproof housing supports a multitude of interfaces including USB and Ethernet as well as on-board logging. An intuitive web interface is available for easy configuration.

FEATURES

GNSS Technology

Multi-frequency L1/L2/L5 code/carrier tracking of GPS/GLONASS/GALILEO/BEIDOU

136 hardware channels for simultaneous tracking of all visible satellite signals

100 Hz IQ measurements (user selectable)

A Posteriori Multipath Estimator technique (APME)

Up to 3 SBAS channels (EGNOS, WAAS, other)

Connectivity

x PPS output (x = 1, 2, 5, 10)

2 Event markers

Raw data output (code, carrier, nav data)

4 hi-speed serial ports

1 Ethernet port

1 USB 2.0 port

Formats

Highly compact and fully documented Septentrio Binary Format (SBF) output

NMEA v2.30 output format, up to 10 Hz

Intuitive RxControl GUI and detailed operating and installation manual included

SBF2ISMR utility included to generate standard ISMR

PERFORMANCE

Measurement precision^{1,3,4}

σ_ϕ over 60min (phi60) 0.03rad

C/A pseudoranges 5 cm (GPS)⁵

0.16 m (GPS)^{6,7}

7 cm (GLO)⁵

0.25 m (GLO)^{6,8}

E1 pseudoranges 8 cm (GALILEO)^{6,7}

L5/E5a 6 cm (GALILEO)^{6,7}

B1/B2 pseudoranges 8 cm (BEIDOU)^{1,7}

GPS P2 pseudoranges⁶ 0.1 m

GLONASS P pseudoranges⁶ 0.1 m

L1 carrier phase 1 mm

L2 carrier phase 1 mm

L5/E5a carrier phase 1.3 mm

B1/B2 carrier phase 1.3 mm

L1/L2 doppler 0.1 Hz

B1/B2 doppler 0.1 Hz

Time to first fix

Cold start¹⁰ < 45 sec

Warm start¹¹ < 20 sec

Re-acquisition avg 1.2 sec

Tracking performance (C/N0 threshold)^{11,12,13}

Tracking 25 dB-Hz

Acquisition 33 dB-Hz

Acceleration 10 g

Jerk¹⁵ 4 g/sec

PHYSICAL AND ENVIRONMENTAL

Size 250 x 140 x 37 mm

Weight 980 g

Input voltage 9 – 30 VDC

Antenna LNA Power Output

Output voltage +5 VDC

Maximum current 200 mA

Power Consumption 6W typical

Operating temperature -40 to +60 °C

Storage temperature -40 to +85 °C

Humidity 5 % to 95 % (non condensing)

Connectors

Antenna TNC female

Power ODU 3 pins female

COM1 ODU 7 pins female

COM2 ODU 7 pins female

COM3/4/USB ODU 7 pins female

IN ODU 7 pins female

OUT ODU 5 pins female

Ethernet ODU 4 pins female

PPS TNC

Power button

¹ 1 Hz measurement rate

² Performance depends on environmental conditions

³ 1 σ level, averaged over 24h

⁴ C/N0 = 45 dB-Hz

⁵ Smoothed

⁶ Non-smoothed

⁷ Multipath mitigation disabled

⁸ Multipath mitigation enabled

⁹ No information available
(no almanacs, no approximate position)

¹⁰ Ephemeris and approximate position known

¹¹ 95%

¹² Max speed 600 m/sec

¹³ Depends on user settings of tracking loop parameters

¹⁴ During acquisition

¹⁵ During tracking