PolaRx5S
Ionospheric Monitoring GNSS Receiver

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Key Features

▶ **Real Time output of TEC & scintillation indices output**

▶ **Tracks all visible GNSS constellations (GPS, GLONASS, Galileo, BeiDou, IRNSS, QZSS, SBAS)**

▶ **High precision, low noise measurements**

▶ **Unique interference monitoring**

▶ **Powerful web interface and logging tools**

▶ **Durable housing and multiple communications options**

▶ **Low and scalable power consumption**

PolaRx5S is the world's leading ionospheric GNSS receiver. Consuming less power than many of its competitors, the PolaRx5S generates ultra-low noise GNSS measurements while logging and streaming data at up to 100 Hz. The PolaRx5S compact and durable housing, low power consumption and open technology make it ideal for rapid and efficient integration into your existing network.

Space Weather Applications

PolaRx5S outputs an extensive set of GNSS measurements, including signal phase and intensity at up to 100 Hz, with a phase noise standard deviation (Phi 60) as low as 0.03 rad.

Tracking All Visible Constellations

Independent comparison testing has verified that the PolaRx5 family is best in its class for quality and availability of GNSS measurements.

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.

Any Device, Any Platform

Use any device with a web browser to operate the PolaRx5S via the built-in Web UI accessible over Wi-Fi, Ethernet or USB. PolaRx5S comes with RxTools: a suite of applications that complements the Web UI with advanced display and analysis tools. RxTools is available for Windows and Linux.

PolaRx5S

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 and 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 analyser

In-band and out-band interference robustness

Formats

ISMR (Ionospheric Scintillation Monitoring) file generated using the provided SBF2ISMR utility records

Real Time TEC & scintillation indices output

Raw data in RTCM 3 format (all MSM messages supported)

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

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

PERFORMANCE

Measurement precision [1,3,4]

σ_ϕ over 60 min (Phi 60)	0.03 rad
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

Tracking performance (C/N0 threshold)[8]

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

PHYSICAL AND ENVIRONMENTAL

Size	284 x 140 x 37 mm
	(11.18 x 5.51 x 1.45 in)
Weight	1.06 kg (2.33 lb)
Input voltage	9 – 30 VDC

Antenna LNA Power Output

Output voltage	+5 VDC
Maximum current	200 mA

Power Consumption	3.8 – 6 W
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/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
Wi-Fi-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] Depends on user settings of tracking loop parameters

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