PolaRx4/4TR
Multi-frequency GNSS Reference Station

septentrio

Key Features

▶ **Tracks all visible signals (GPS, GLONASS, GALILEO, BEIDOU)**

▶ **Unique interference monitoring**

▶ **Powerful GUI and logging tools**

▶ **Rugged housing and multiple interfaces**

▶ **Special time/frequency transfer variant (PolaRx4TR)**

PolaRx4 is built around the proven GReCo3TM multi-constellation tracking processor, and provides 264 hardware channels that are assigned automatically and on-the-fly to all visible satellites.

Tracking of all visible signals
The PolaRx4/4TR features simultaneous high-quality tracking of all visible signals (L1, L2, L5, E5ab/AltBOC GPS/GLONASS/ Galileo/ Beidou/SBAS) at unbeaten low noise levels.

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.

Networking, remote operation, and data logging
Communication and (remote) management of PolaRx4 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 a built-in 8GB memory, optionally extendable to 32 GB. Logged data can be accessed through the built-in FTP server or automatically pushed to a distant FTP server.

RxTools for flexible data manipulation
As with all Septentrio receivers, PolaRx4 comes with RxTools, a suite of applications that complements the web interface with advanced display and analysis tools.

PolaRx4TR: unique timing receiver
PolaRx4TR is a special variant of PolaRx4, which accepts an external 10 MHz reference and 1PPS input to perfectly synchronize the GNSS measurements with an external time and frequency standard, making PolaRx4TR perfectly suited for frequency and time transfer applications. Additionally, the PolaRx4 family features a GNSS-disciplined 10 MHz output. CGGTTS files can be generated in real-time with RxTools every 1,6 or 24 hours

PolaRx4/4TR

FEATURES

GNSS Technology

Multi-frequency L1/L2/L3/L5/E5abAltBoc code/carrier tracking of GPS, GLONASS, BEIDOU and GALILEO EBOS

Codeless tracking of GPS P1 and P2

264 hardware channels for simultaneous tracking of signals from GPS GLONASS, GALILEO, BEIDOU and SBAS satellites in the supported bands

Up to 50 Hz raw measurements

A Posteriori Multipath Estimator (APME+)

Advanced Interference mitigation (AIM+) :

Spectrum analyzer

Raw data output

Formats

RTCM v2.2, 2.3, 3.0 or 3.1

CMR 2.0

Highly compact and detailed Septentrio Binary Format (SBF) output

NMEA v2.30 output format, up to 10 Hz

Start/Stop logging via button

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

Support for standard MET/Tilt sensors

Connectivity

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

10 MHz reference input/output (disciplined)

4 hi-speed serial ports

1 Ethernet port

1 full speed USB port

8 GB standard on-board logging

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

Ntrip server

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

1 PPS-in for time/frequency transfer (PolaRx4TR)

PERFORMANCE

Measurement precision[1,3,4]

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/E5ab	6 cm (GALILEO)[6,7]
E5 AltBOC	1.5 cm (GALILEO)[6,7]
GPS P2 pseudoranges[6]	0.1 m
GLONASS P pseudoranges[6]	0.1 m
B1/B2 pseudoranges	8 cm (BEIDOU)[6,7]
L1 carrier phase	1 mm
L2 carrier phase	1 mm
L5/E5 carrier phase	1.3 mm
L1/L2/L5 doppler	0.1 Hz
B1/B2 doppler	0.1 Hz

Maximum Update rate

	50Hz

Time accuracy[3]

1PPS	10 nsec

Time to first fix

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

Tracking performance (C/N0 threshold)[11,12,13]

Tracking	26 dB-Hz
Acquisition	33 dB-Hz

Dynamics

Acceleration	10 g
Jerk[15]	4 g/sec

PolaRx4TR Time Transfer Accuracy

The PolaRx4TR entirely complies with the precise time transfer requirements and procedures set forth by the BIPM, and are routinely used as time transfer equipment for UTC determination. Typical time transfer accuracy is better than 2ns.

PHYSICAL AND ENVIRONMENTAL

Size	235 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 +65 °C
Storage temperature	-40 to +85 °C
Humidity	5 % to 95 % (non condensing)

Connectors

Antenna	TNC female
Ref in/out	BNC female
1PPS out/in [(1PPS in on PolaRx4TR PRO only)]	BNC 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 Ethernet	ODU 5 pins female
Power Button	ODU 4 pins female
Logging Button	

[1] 1 Hz measurement rate

[2] Performance depends on environmental conditions

[3] 1σ level

[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