

AsteRx-m™

Compact low-power dual-frequency GPS/GLONASS Receiver



Ultra low power, smaller than credit card GPS/GLONASS dual-frequency RTK receiver, for integration in hand-held devices, mobile computing platforms and other space-constrained applications requiring high accuracy and low-power consumption.

Unique compact low-power RTK receiver

Measuring only 70 by 48 mm, the AsteRx-m provides cm-level dual-frequency GPS RTK operation at less than 500 mW, and dual-frequency GPS/GLONASS RTK positioning at less than 600 mW. It is fully scalable from L1-only positioning to L1/L2 GPS/GLONASS operation.

World-class performance with GNSS+

AsteRx-m offers innovative tracking and positioning algorithms designed for demanding industrial environments, including:

- APME+ code and phase multipath mitigation technology
- Track+ for robust tracking under weak signal conditions such as under foliage
- RTK+, a novel, multi-system cm-accurate positioning engine using innovative real-time modeling of GNSS errors and a new mixed-mode fixing approach for robust performance and high availability in difficult environments
- GLO+, a special ultra precise GLONASS bias calibration method to increase accuracy, robustness and compatibility

Easy to integrate

Two antenna connectors are available: one can be connected to an internal antenna, while connecting a high-grade external antenna remains possible. A compact I/O connector allows integration in slim devices. The board is fully shielded to help avoid EMI issues. An extensive set of commands and data messages provides the integrator with full flexibility.

A comprehensive GNSS SW-toolset

RxTools provides an intuitive GUI (RxControl) for receiver configuration and remote control. Various tools for mission planning, data logging, replay and analysis, reporting, and more are included.

Key Features

- Unique compact GPS/GLONASS RTK receiver
- Industry leading low power consumption (600mW at full operation)
- cm-level positioning accuracy
- Special GNSS+ algorithms for robust industrial performance
- Full EMI shielding
- Easy to integrate, incl. extensive and well documented interface language
- A comprehensive GNSS SW-toolset



Versatile OEM Receivers for Demanding Applications

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FEATURES

- Dual-frequency L1/L2 code/carrier tracking of GPS and GLONASS signals.
- 132 hardware channels for simultaneous tracking of all visible satellites in GPS and GLONASS constellations
- GNSS+ pack containing APME+, Lock+ and RTK+, AIM+ and ATrack+
- Positioning modes : stand-alone, SBAS, DGNSS, RTK, PPP¹⁴
- Includes up to 3 SBAS channels (EGNOS, WAAS, other)
- RAIM included
- Raw data output (code, carrier, navigation data)
- 25 Hz data output rate (user selectable)
- x PPS output (x = 1, 2, 5, 10)
- 1 Event marker
- 2 antenna connectors (internal/external antenna) with automatic external antenna detection
- 3 high-speed serial ports
- 1 full speed USB port
- Highly compact and detailed Septentrio Binary Format (SBF) output
- NMEA v2.30 output format, up to 10 Hz
- RTCM v2.2, 2.3, 3.0 or 3.1
- CMR2.0 and CMR+
- Includes intuitive GUI (RxControl) and detailed operating and installation manual

PHYSICAL AND ENVIRONMENTAL

Power dissipation	GPS L1	320 mW
	GPS L1/L2	490 mW
	GPS/GLONASS L1/L2	600 mW
	Shutdown	150 µW

Input supply voltage	3.3 VDC +/- 5%
Size	47.5 x 70 mm
Weight	40 g
I/O connector	30 pins Hirose DF40 socket

Antenna

Connectors	U,FL
Antenna supply voltage	3-6 VDC
Maximum current	200 mA
Detection current	< 6 mA

Operating temperature	-35 to +85 °C
Storage temperature	-40 to +85 °C
Humidity	5 % to 95 % (non condensing)

PERFORMANCE

Position accuracy ^{1,2,3,5}	Horizontal	Vertical
	Standalone	1.3 m
SBAS	0.6 m	0.8 m
DGPS	0.5 m	0.9 m

RTK performance ^{1,10}	
Horizontal accuracy ³	0.6 cm + 0.5 ppm
Vertical accuracy ³	1 cm + 1 ppm
Average time to fix ⁴	7 sec

Velocity Accuracy ^{1,2,3}	
Horizontal ³	0.8 cm/sec
Vertical ³	1.3 cm/sec

Maximum Update rate	25 Hz
Latency	< 20 msec

Time accuracy ³	
1PPS	10 nsec
Event accuracy	< 10 nsec

Time to first fix	
Cold start ⁶	< 45 sec
Warm start ⁷	< 20 sec
Re-acquisition	avg 1.2 sec

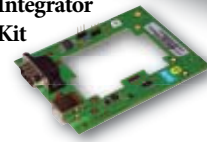
Tracking performance	
C/N0 threshold ^{8,9,11}	
Tracking	26 dB-Hz
Acquisition	33 dB-Hz

Sensitivity, internal antenna	
Tracking	-148 dBm
Acquisition	-141 dBm

Dynamics	
Acceleration ¹²	10 g
Jerk ¹³	4 g/sec

- 1 1 Hz measurement rate
- 2 Performance depends on environmental conditions
- 3 1σ level
- 4 Baseline < 20 km
- 5 Smoothed
- 6 No information available (no almanacs, no approximate position)
- 7 Ephemeris and approximate position known
- 8 95%
- 9 Max speed 600 m/sec
- 10 Fixed ambiguities
- 11 Depends on user settings of tracking loop parameters
- 12 During acquisition
- 13 During tracking
- 14 Requires Veripos or TERRASTAR corrections. L-band demodulator not included

Integrator Kit



OTHER SEPTENTRIO PRODUCTS

AsteRx2e/2eL – Compact dual-frequency GPS/GLO-NASS receiver platform, offering top-quality GPS code and carrier phase data and dual-frequency positioning (including DGPS, RTK and PPP (AsteRx2eL)) at up to 25 Hz.

AsteRx3 – A Multi-frequency GPS/GLONASS/GALILEO receiver for demanding industrial applications, featuring precise RTK with extended baselines, advanced multipath and interference mitigation and exceptional tracking stability under high vibration conditions.

AsteRx2eH – A unique single-board dual-frequency multi-antenna GPS/GLONASS receiver in a waterproof aluminum housing, that can be connected to 2 antennas for various machine control, heading and other multi-antenna applications.

AsteRxi – IMU assisted Compact Dual-frequency GNSS receiver platform, offering a 50Hz RTK position based on integrated IMU and GNSS measurements. In addition attitude information such as heading, pitch and roll are provided even in shadowed environments where conventional GNSS receivers fail.

PolaRx4 – fully featured high performance GNSS receiver providing network operators and scientific users with high-quality tracking and measurement of all available and upcoming GNSS signals (GPS/GALILEO/GLONASS/COMPASS/SBAS)

PolaRxS – a multi-frequency multi-constellation receiver dedicated to ionospheric monitoring and space weather applications

PolaNt* – A set of lightweight sturdy precise positioning and survey single, dual- or multi-frequency GPS, GPS/GLONASS and GPS/GLONASS Galileo/L-band antennas for use with the PolaRx and AsteRx receiver family.

Chokering MC – A multi-frequency GPS/GLONASS/Galileo L1/L2/E5abAltBOC chokering antenna for use with the PolaRx receiver family

RxTools – A suite of software applications for easy control of PolaRx and AsteRx receivers, and for easy manipulation, analysis and reporting of the data generated with these receivers

RxMobile – A unique intuitive, portable GUI field controller for the Septentrio receivers. RxMobile allows controlling the receiver, monitoring the navigation solution and accessing its functions in the field in the same intuitive way as with RxControl.



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