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.

Compact RTK receiver
Measuring only 70 x 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.
FEATURES

GNSS Technology
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+
Positioning modes: stand-alone, SBAS, DGNSS and RTK
3 channels for SBAS tracking (EGNOS, WAAS, GAGAN MSAS, SDCM)

RAIM
Raw data output (code, carrier, navigation data - optional)

Connectivity
x PPS output (x = 1, 2, 5, 10)
1 Event marker
2 antenna connectors (internal/external antenna) with automatic external antenna detection
3 Hi-speed serial ports
1 full speed USB port
On-board logging on Micro-SD card (max 32 GB)

Formats
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

PERFORMANCE

Position accuracy1,2,3,45,7

<table>
<thead>
<tr>
<th>Mode</th>
<th>Horizontal</th>
<th>Vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standalone</td>
<td>1.2 m</td>
<td>1.9 m</td>
</tr>
<tr>
<td>SBAS</td>
<td>0.6 m</td>
<td>0.8 m</td>
</tr>
<tr>
<td>DGPS</td>
<td>0.4 m</td>
<td>0.9 m</td>
</tr>
</tbody>
</table>

RTK performance1,2,3,4

<table>
<thead>
<tr>
<th>Mode</th>
<th>Horizontal</th>
<th>Vertical</th>
</tr>
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<tbody>
<tr>
<td>Position</td>
<td>0.6 cm + 0.5 ppm</td>
<td>1 cm + 1 ppm</td>
</tr>
<tr>
<td>Average time to fix</td>
<td>7 s</td>
<td></td>
</tr>
</tbody>
</table>

Velocity Accuracy1,2,3,7

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<tr>
<th>Mode</th>
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<tbody>
<tr>
<td></td>
<td>0.01 m/s</td>
<td>0.0015 m/s</td>
</tr>
</tbody>
</table>

Maximum Update rate

Position (Standalone, SBAS, DGNSS) 20 Hz
Position (RTK) 10 Hz
Measurements 20 Hz

Latency
< 20 ms

Time accuracy4

<table>
<thead>
<tr>
<th>Mode</th>
<th>xPPS Out</th>
<th>Event accuracy</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>10 ns</td>
<td>&lt; 20 ns</td>
</tr>
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</table>

Time to first fix

Cold start6 < 45 s
Warm start7 < 20 s
Re-acquisition avg. 1.2 s

Tracking performance (C/N0 threshold)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Tracking</th>
<th>Acquisition</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>20 dB-Hz</td>
<td>33 dB-Hz</td>
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Dynamics

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<tr>
<th>Mode</th>
<th>Acceleration</th>
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<tr>
<td></td>
<td>10 g</td>
<td>4 g/s</td>
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PHYSICAL AND ENVIRONMENTAL

Power dissipation

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<tr>
<th>Mode</th>
<th>Power (mW)</th>
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<tr>
<td>GPS L1</td>
<td>320</td>
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<tr>
<td>GPS L1, L2</td>
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<tr>
<td>GPS/GLONASS L1/L2</td>
<td>600</td>
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<tr>
<td>Shutdown</td>
<td>150 μW</td>
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Input voltage

3.3 V DC ± 5%

Size

47.5 x 70 mm (1.87 x 2.75 in)

Weight

27 g (0.95 oz)

I/O Connector
30 pins Hirose DF40 socket

Antenna

Connectors: U.FL
Antenna supply voltage: 3-6 V DC
Maximum current: 200 mA
Detection current: < 6 mA

Operating temperature

-40°C to +85°C

Storage temperature

-40°C to +85°C

Certification

RoHS

1 1 Hz measurement rate
2 Performance depends on environmental conditions
3 1σ level
4 Baseline: <100 km
5 No information available (no almanacs, no approximate position)
6 Ephemeris and approximate position known
7 Max speed 600 m/s

AsteRx-m

On-board logging on Micro-SD card (max 32 GB)

RTCM v2.2, 2.3, 3.0 or 3.1

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