AsteRx-m Compact low-power dual frequency GNSS receiver

Key Features

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

Compact RTK receiver
Measuring only 70mm 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.

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.
### 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+, 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)

**Connectivity**

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

**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 accuracy**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Horizontal</th>
<th>Vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standalone</td>
<td>1.3 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>0.5 m</td>
<td>0.9 m</td>
</tr>
</tbody>
</table>

**RTK performance**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Horizontal</th>
<th>Vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standalone</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 sec</td>
<td></td>
</tr>
</tbody>
</table>

**Velocity Accuracy**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Horizontal</th>
<th>Vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standalone</td>
<td>0.8 cm/s</td>
<td>1.3 cm/s</td>
</tr>
</tbody>
</table>

**Maximum Update rate**

25 Hz

**Latency**

< 20 msec

**Time accuracy**

1PPS: 10 nsec

Event accuracy: < 10 nsec

**Time to first fix**

Cold start: < 45 sec

Warm start: < 20 sec

Re-acquisition: avg 1.2 sec

**Tracking performance (C/N0 threshold)**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Tracking</th>
<th>Acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracking</td>
<td>26 dB-Hz</td>
<td>33 dB-Hz</td>
</tr>
</tbody>
</table>

**Sensitivity, internal antenna**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Tracking</th>
<th>Acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracking</td>
<td>-148 dBm</td>
<td>-141 dBm</td>
</tr>
</tbody>
</table>

**Dynamics**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Acceleration</th>
<th>Jerk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceleration</td>
<td>10 g</td>
<td>4 g/sec</td>
</tr>
</tbody>
</table>

### PHYSICAL AND ENVIRONMENTAL

**Power dissipation**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Power (mW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS L1</td>
<td>320 mW</td>
</tr>
<tr>
<td>GPS L1/L2</td>
<td>490 mW</td>
</tr>
<tr>
<td>GPS/GLONASS L1/L2</td>
<td>600 mW</td>
</tr>
<tr>
<td>Shutdown</td>
<td>150 μW</td>
</tr>
</tbody>
</table>

**Input 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**

-40 to +85 °C

**Storage temperature**

-40 to +85 °C

**Certification**

RoHS

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1 1 Hz measurement rate
2 Performance depends on environmental conditions
3 1σ level
4 Baseline < 100 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