Septentrio mosaic-X5™ is a multi-constellation receiver packaged in a low-power surface mount module. With a wide array of interfaces, mosaic-X5™ has been specifically designed for the needs of mass market applications like robotics and autonomous systems. This high-reliability receiver tracks all Global Navigation Satellite System (GNSS) constellations and supports all current and future signals. With Septentrio’s unique AIM+ technology for interference mitigation included, Septentrio is now offering a performance benchmark in mass market GNSS positioning.

**KEY FEATURES**

- Small size, big performance
- All-in-view satellite tracking: multi-constellation, multi-frequency
- Best-in-class RTK performance
- OSNMA Support
- AIM+ industry-leading anti-jamming, anti-spoofing technology
- Industry-leading ultra-low power consumption
- Easy-to-integrate

**BENEFITS**

**No performance compromises**

Sized at only 31 x 31 x 4 mm / 1.22 x 1.22 x 0.16 inches and weighing only 7 g, mosaic-X5™ offers unmatched size to performance ratio. mosaic-X5™ includes:

- High update rate (>100 Hz) and low latency, both crucial for control systems of autonomous applications
- Reliable centimetre-level positioning
- Full L2 support via P(Y) code

**Designed for automated assembly**

The mosaic-X5™ module is designed for high volume automated assembly lines with minimal amount of additional components required. All interfaces, commands and data messages are fully documented. The RxTools software suite allows convenient receiver configuration, monitoring, data logging and analysis. Offline processing is easy via our GeoTagZ software and its SDK library for PPK (Post Processed Kinematic).

**Advanced technologies inside**

Septentrio’s GNSS+ toolset enables accuracy and reliability in the toughest conditions, allowing you to complete projects with high quality and efficiency. It includes:

- **AIM+** the most advanced anti-jamming, anti-spoofing on-board interference mitigation technology on the market (narrow and wide band, chirp jammers).
- **LOCK+** for robust tracking during high vibrations and shocks.
- **APME+** multipath mitigation to disentangle direct signal and those reflected from nearby structures.
- **IONO+** provides advanced protection against ionospheric disturbances.
### FEATURES

- **GNSS technology**
  - 448 hardware channels for simultaneous tracking of all visible supported satellite signals:
  - GPS: L1C/A, L1PY, L2C, L2P, L5
  - GLONASS: L1CA, L2CA, L2P, L3 CDMA
  - BeiDou: B1I, B1C, B1B, B2b, B2I, B3
  - Galileo: E1, E5a, E5b, E5 AltBoc, E6
  - QZSS: L1C/A, L1 C/B, L2C, L5
  - NavIC: L5
  - SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
  - On module L-band
- **Septentrio’s patented GNSS+ technologies**
  - AIM+ industry leading anti-jamming, anti-spoofing interference monitoring & mitigation technology
  - IONO+ advanced scintillation mitigation
  - APME+ a posteriori multipath estimator for code and phase multipath mitigation
  - LOCK+ superior tracking robustness under heavy mechanical shocks or vibrations
  - RAIM+ receiver autonomous integrity monitoring
  - OSNMA Support
- **5 constellation RTK (base and rover)**
- **Moving base RTK**

### PERFORMANCE

#### RTK performance

<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>DGNSS</td>
<td>0.4 m</td>
<td>0.7 m</td>
</tr>
</tbody>
</table>

**Maximum update rate**

- Position: 100 Hz
- Measurements only: 100 Hz

**Velocity accuracy**

- 3 cm/s

**Time precision**

- xPPS out: 5 ns
- Event accuracy: < 20 ns

**Time to first fix**

- Cold start: < 45 s
- Warm start: < 20 s
- Re-acquisition: 1 s

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

- Tracking: 20 dB-Hz
- Acquisition: 33 dB-Hz

**Firmware**

- Free product lifetime upgrades

### PHYSICAL AND ENVIRONMENTAL

- **Package**
  - Type: SMT solderable land grid array
  - Size: 31 x 31 x 4 mm / 1.29 x 1.29 x 0.15 in
  - Weight: 6.8 g / 0.24 oz

- **Electrical**
  - Antenna pre-amplification range: 15-50 dB
  - Antenna bias voltage: 3.0-5.5 V
  - Build-in current limit: 150 mA
  - Input voltage: 3.3 VDC
  - Power consumption: 0.6 W typ / 1.1 W max

- **Environmental**
  - Operating temp: -40 to 85° C
  - Storage temp: -55 to 85° C
  - Humidity: 5% - 95% (non-condensing)

- **Vibration**
  - MIL-STD-810G

- **Certification**
  - CE, RoHS, WEEE, UKCA
  - ISO 9001-2015

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1. Configuration dependent
2. Output rate 20 Hz
3. Open sky conditions
4. RMS levels
5. Baseline <40 km
6. After convergence
7. 99.9%
8. Incl. software compensation of sawtooth effect
9. No information available (no almanac, no approx position)
10. Ephemeris and approx. position known