Septentrio mosaic™-X5, a brand new multi-band, multi-constellation receiver, packaged in a low power surface mount module, offers a wide array of interfaces. mosaic™ has been specifically designed with the needs of mass market applications like robotics and autonomous systems in mind. Capable of tracking all Global Navigation Satellite System (GNSS) constellations and supporting 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 building blocks.

KEY FEATURES

- Small size, big performance
- All-in-view satellite tracking: multi-constellation, multi-frequency
- Uncompromisable RTK performance
- AIM+ unique interference monitoring and mitigation technology
- Industry-leading ultra-low power consumption
- Easy-to-integrate

BENEFITS

No compromises
The best of both worlds: small sized with solid performance. High update rates (>100 Hz) and low latency, both are crucial for control systems of any type of autonomous applications. High accuracy centimetre level positioning. Multi-constellations and multi-frequency. Full L2 support via P(Y) code.

More compact than ever
Sized at only 31 x 31 x 4 mm / 1.22 x 1.22 x 0.16 in mosaic™ offers unparalleled size to performance ratio. Lighter than ever too, at less than 7 g / 0.24 oz your automated assembly is going to be hassle free.

Meant for automated assembly
The mosaic™ module is designed for high volume automated assembly lines. With minimal amount of additional real estate required for design in. Fully-documented interfaces, commands and data messages are provided. The compatible and free of charge RxTools software suite allows receiver configuration, data logging and analysis. Offline processing is enabled via our GeoTagZ software and its SDK library for PPK (PostProcessed Kinematic).

Advanced technologies inside
Septentrio's GNSS+ toolset enables accuracy and reliability in the toughest conditions through:

- AIM+ the most advanced 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.

Allowing you to carry on with the highest possible efficiency.
FEATURES

GNSS technology
448 hardware channels for simultaneous tracking of all visible supported satellite signals:
- GLONASS: L1CA, L2CA, L2P, L3 CDMA
- Beidou: B1I, B1C, B2a, B2I, B3
- Galileo: E1, E5a, E5b, E5 AltBoc, E6
- QZSS: L1C/A, L1C, L2C, L5, L6
- Navic: L5
- SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- On module L-band

Septentrio's patented GNSS+ technologies
- AIM+ interference monitoring and mitigation (narrow band, wide band, chirp jammers)
- 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
- 4 constellation RTK (base and rover)
- RAIM (Receiver Autonomous Integrity Monitoring)
- PPP SECORX
- Moving base RTK

Protocols
- Septentrio Binary Format (SBF)
- NMEA 0183, v2.3, v3.03, V4.0
- RINEX v2.x, v3.x
- RTCM v2.x, v3.x (MSM included)
- CMR v2.0 (out/in), CMR+ (input only)

Interfaces
- 4 UART (LVTTL, up to 4 Mbps)
- Ethernet (RMII/MDIO), 10/100 Mbps
- USB device (2.0, HS)
- SDIO (mass storage)
- 2 GPIO user programmable
- CAN
- 2 Event markers
- 1 Configurable PPS out
- Auxiliary RF interface

PERFORMANCE

RTK performance
- Horizontal accuracy: 0.6 cm + 0.5 ppm
- Vertical accuracy: 1 cm + 1 ppm
- Initialisation time: 7 s

Other positioning modes accuracy
- Standalone: Horizontal 1.2 m, Vertical 1.9 m
- SBAS: Horizontal 0.6 m, Vertical 0.8 m
- DGNSS: Horizontal 0.4 m, Vertical 0.7 m
- SECORX (PPP): Horizontal 0.04 m, Vertical 0.06 m

Velocity accuracy
- 3 cm/s

Maximum update rate
- Position: 100 Hz
- Measurements only: 100 Hz

Latency
- <10 ms

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 +/-5%
- Power consumption: 0.6 W typ, 1.1 W max

Environmental
- Operating temp: -40 to 85° C, -40 to 185° F
- Storage temp: -55 to 85° C, -67 to 185° F
- Humidity: 5% 95% (non-condensing)
- Vibration: MIL-STD-810G
- Certification: CE, RoHS, WEEE

EMEA (HQ)
Greenhill Campus
Interleuvenlaan 15i
3001 Leuven, Belgium
+32 16 30 08 00
septentrio.com

Americas
Suite 200
23848 Hawthorne Blvd
Torrance, CA 90505, USA
+1 310 541 8139
sales@septentrio.com

Asia-Pacific
Shanghai, China
Yokohama, Japan

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

*Specifications subject to change without notice. Certain features and specifications may not apply to all models. © 2019 Septentrio NV. All rights reserved.