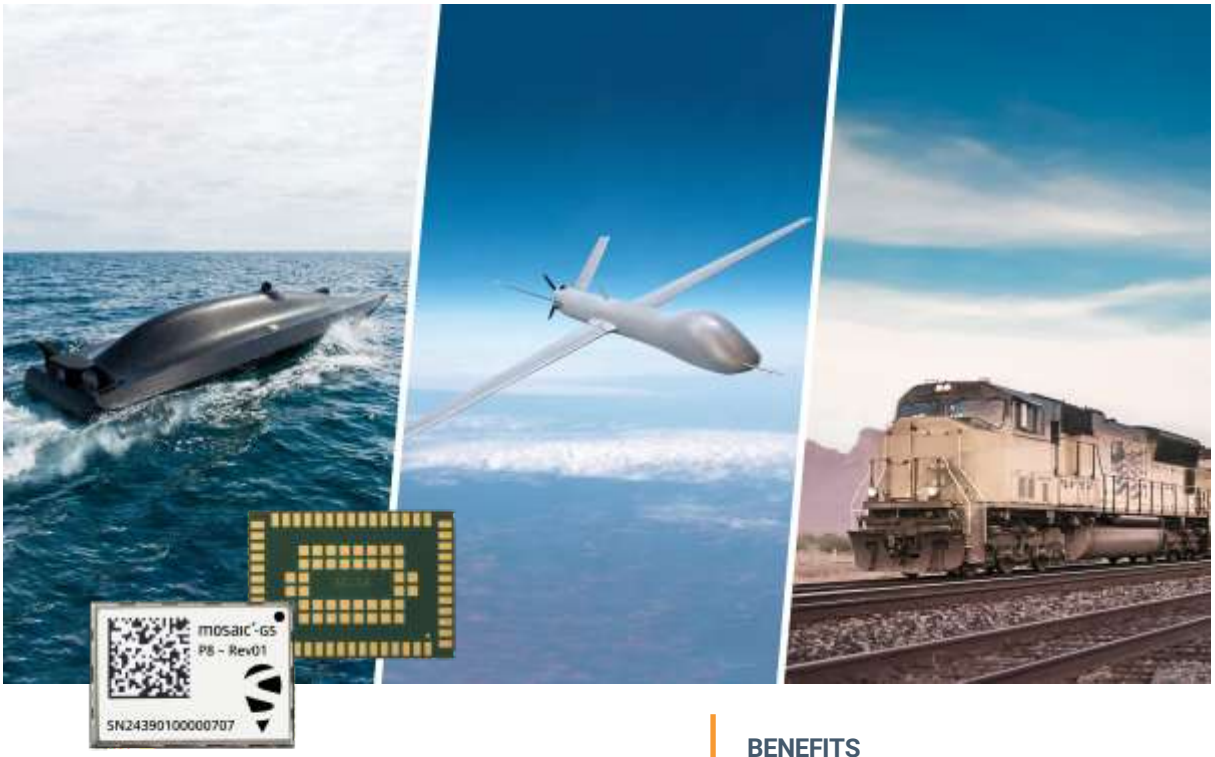
mosaic-G5 P8

Ultra-compact multi-frequency GNSS receiver with ultimate resilience



Defence
A-PNT

Rail

Critical
Infrastructure

Marine

Septentrio mosaic-G5 P8™ is a high precision multi-frequency GNSS receiver module optimized for mission-critical operations where resilient positioning is essential. This high-reliability receiver tracks all Global Navigation Satellite System (GNSS) constellations and supports all current and future signals, ensuring long-term operational continuity. With Septentrio's AIM+ Ultimate technology for jamming and spoofing mitigation included, the mosaic-G5 P8™ sets a benchmark for assured and robust positioning performance.

KEY FEATURES

- **Small size, Excellence in performance**
- **All-in-view satellite tracking: multi-constellation, multi-frequency tracking of all available signals**
- **Single or dual antenna support**
- **Ultimate detection and protection against GNSS jamming and spoofing with industry leading AIM+ technology**
- **Ultra-low power consumption**
- **End-to-end authentication for secure operations**
- **Easy to integrate**

BENEFITS

No performance compromises

Sized at only 22.8 x 16.4 mm, mosaic-G5 P8™ delivers an exceptional size-to-performance ratio in an all-in-one solution. Designed for mission-critical and high-precision systems, it is engineered for reliable performance where security and uptime matter most. The receiver provides robust centimeter-level position and attitude with high-rate (100Hz), low-latency updates. Its ultimate resilience capabilities are optimized for operational continuity and situational awareness, helping systems maintain a trusted position even in interference-prone environments.

Designed for automated assembly

The mosaic-G5 P8™ module is designed for high volume automated assembly lines. All interfaces, commands and data messages are fully documented. The RxTools software suite allows convenient receiver configuration and analysis.

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. The **GNSS+** toolset of this receiver includes:

- **AIM+ Ultimate** functionality with maximum protection against the most sophisticated and high-power threats, ensuring integrity in the most adverse conditions.
- **LOCK+** for robust tracking during high vibrations and shocks.
- **APME+** multipath mitigation to disentangle direct signal and those reflected from nearby structures.
- **IONO+ Full Protection** provides advanced protection against ionospheric disturbances.

mosaic-G5 P8

mosaic
Your positioning cornerstone

HEXAGON | septentrio

FEATURES

GNSS technology

789 hardware channels for simultaneous tracking of all visible supported satellite signals:

- GPS: L1C/A, L1C, L2C, L2PY, L5
- GLONASS: L1CA, L2CA, L2P, L3 CDMA
- Beidou: B1I, B1C, B2a, B2b, B2I, B3I
- Galileo: E1, E5a, E5b, E5 AltBoc, E6
- QZSS: L1C/A, L1 C/B, L2C, L5, L6
- Navic: L5
- On module L-band (in single antenna configuration)

GNSS Heading
Galileo High Accuracy Service (HAS)
Galileo OSNMA
Full raw measurement data
4-constellation RTK (rover)

Septentrio's patented GNSS+ technologies

- **AIM+ Ultimate** functionality with maximum protection against the most sophisticated and high-power threats, enuring integrity in the most adverse conditions.
- **APME+** a posteriori multipath estimator for code and phase multipath mitigation
- **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations
- **IONO+ Full Protection** provides advanced protection against ionospheric disturbances
- **RAIM+** receiver autonomous integrity monitoring

Protocols

Septentrio Binary Format (SBF)
NMEA 0183, v2.3, v3.03, V4.0
RTCM v3.x (MSM included)
Authenticated in- and output through DTLS

Interfaces

2 UART (LVTTL, up to 4 Mbps)
USB device (2.0, HS up to 480Mbps)
2 GPIO user programmable
2 Configurable PPS out
2 Event markers

PERFORMANCE

RTK performance [1,2,3]

Horizontal accuracy	0.6 cm + 0.5 ppm
Vertical accuracy	1 cm + 1 ppm
Initialization time	7s

Other positioning modes accuracy [1,2,3]

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.9 m
DGNSS	0.4 m	0.7 m
HAS	0.1 m	0.2 m

Velocity accuracy

3 cm/s

GNSS attitude accuracy [1,2]

Antenna Separation	Heading	Pitch/Roll
1m	0.15°	0.25°
5m	0.03°	0.05°

Maximum update rate

Position	100 Hz
Measurements only	100Hz
Standalone, DGNSS + attitude	50Hz
RTK + attitude	50Hz

Latency [4,5]

< 10 ms

Time precision

PPS precision [2,3]	5 ns
PPS jitter	± 0.7 ns
Event accuracy	< 3 ns

Time to first fix

Cold start [6]	< 35 s
Warm start [7]	< 10 s
Re-acquisition	1 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	30 dB-Hz

PHYSICAL AND ENVIRONMENTAL

Package

Type	SMT solderable land grid array
Size	22.8 x 16.4 x 2.4 mm
Weight	2.2 g

Electrical

Antenna preamplification range	15-50 dB SA 15-35 dB DA
Antenna bias voltage	3.0-5.5 V Built-in current limit (150 mA)
Input voltage	3.3 VDC
Power consumption SA	0.44 W typ/0.67 Max
Power consumption DA	0.6 W typ/0.785 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	IEC 60721-3-5 Profile 5M3
Certification	CE, FCC, RoHS, WEEE

[1] Static positioning only
[2] Open sky conditions
[3] RMS levels
[4] 99.9%
[5] Non-moving-base operations
[6] No information available (no almanac, no approx position)
[7] Ephemeris and approx. position known

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