

mosaic-G5 P6

Ultra-compact multi-frequency GNSS receiver with premium resilience



- Survey, GIS & mapping
- Automation
- Rail
- UAV
- Logistics

Septentrio mosaic-G5 P6™ is a high-precision multi-frequency GNSS receiver module designed as an all-in-one solution for SWaP-sensitive applications. It tracks all Global Navigation Satellite System (GNSS) constellations and supports current and future signals. High update-rates combined with robust centimeter-level position and attitude performance make it ideal for autonomous systems. With a versatile set of interfaces and Septentrio's unique AIM+ Premium technology for anti-jam and anti-spoof resilience, the mosaic-G5 P6™ delivers industry-leading accuracy and reliability in an ultra-small form factor.

KEY FEATURES

- ▶ **Small size, Excellence in performance**
- ▶ **All-in-view satellite tracking: multi-constellation, multi-frequency tracking of all available signals**
- ▶ **Best-in-class RTK centimeter-level performance**
- ▶ **Single or dual antenna support**
- ▶ **Superior detection and protection against GNSS jamming and spoofing with AIM+ technology**
- ▶ **Ultra-low power consumption**
- ▶ **Easy to integrate**

BENEFITS

No performance compromises

Sized at only 22.8 x 16.4 mm, mosaic-G5 P6™ delivers an exceptional size-to-performance solution, enabling high-accuracy positioning in space and power constrained designs. High data rates and low-latency output support fast system response, while a flexible RTK engine allows performance to be tailored to a wide range of deployment scenarios. Combined with premium resilience features for interference and spoofing mitigation, mosaic-G5 P6™ delivers powerful, reliable performance in demanding autonomous and industrial environments.

Designed for automated assembly

The mosaic-G5 P6™ 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+ Premium** functionality with enhanced jamming and spoofing protection offering superior narrow and wideband resilience and OSNMA authentication in demanding RF environments.
- ▶ **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.

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+ Premium** with enhanced jamming and spoofing protection offering superior wideband resilience and OSNMA authentication in demanding RF environments
- ▶ **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

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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