

# mosaic-G5 P1

Ultra-compact high-precision GNSS receiver with essential functionality



Septentrio mosaic-G5 P1™ is a very small size multi-frequency GNSS receiver module in a low-power surface mount package. It tracks all GNSS constellations for reliable high-accuracy positioning even in challenging environments. With a comprehensive set of interfaces, this receiver has been designed for the growing market of high-precision applications like UAV and autonomous systems.

## KEY FEATURES

- ▶ Small size, essential functionality
- ▶ Triple-band satellite tracking: multi-constellation, multi-frequency receiver
- ▶ Excellent RTK positioning performance
- ▶ Industry-leading ultra-low power consumption
- ▶ Easy-to-integrate

## BENEFITS

### Top value for mass market applications

Sized at only 22.8 x 16.4 mm, mosaic-G5 P1™ offers unmatched size to performance ratio. It delivers centimeter-level positioning and fits into space-constrained applications such as drones, robots, handheld devices or wearables.

### Designed for automated assembly

The mosaic-G5 P1™ 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+** technologies enable accuracy and reliability under the toughest conditions. They include:

- ▶ **AIM+ Basic** functionality with jamming and spoofing detection as well as manual interference mitigation
- ▶ **LOCK+** for robust tracking during high vibrations and shocks.
- ▶ **APME+** multipath mitigation to disentangle direct signals and those reflected from nearby structures.

## 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, B2I, B3I
- ▶ Galileo: E1, E5a, E5b,
- ▶ QZSS: L1C/A, L1 C/B, L2C, L5

### Septentrio's patented GNSS+ technologies

- ▶ **AIM+ Basic** functionality with jamming and spoofing detection as well as manual interference 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

5 constellations RTK (rover)

### Protocols

Septentrio Binary Format (SBF)  
NMEA 0183, v2.3, v3.03, V4.0  
RTCM v3.x (MSM included) input

### Interfaces

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

## PERFORMANCE

### RTK performance <sup>1,2,3</sup>

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

### Other positioning modes accuracy <sup>1,2</sup>

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
DGNSS	0.4 m	0.7 m

### Velocity accuracy

3 cm/s

### Maximum update rate

Position 5 Hz

### Latency <sup>4</sup>

<10 ms

### Time precision

PPS resolution 1.4 ns

### Time to first fix

Cold start <sup>5</sup>	< 35 s
Warm start <sup>6</sup>	< 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
Antenna bias voltage	3.0-5.5 V
	Built-in current limit (150 mA)
Input voltage	3.3 VDC
Power consumption	0.44 W typ
	0.57 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	IEC 60721-3-5 Profile 5M3 MIL-STD-810H 514.8 - Category 4 MIL-STD-810H 516.8 - Procedure I
Certification	CE, FCC, RoHS, WEEE, ISED



<sup>1</sup> Open sky conditions

<sup>2</sup> RMS levels

<sup>3</sup> Baseline <40 km

<sup>4</sup> 99.9%

<sup>5</sup> No information available (no almanac, no approx position)

<sup>6</sup> Ephemeris and approx. position known

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