mosaic-G5 P1

Ultra-compact high-precision GNSS receiver with essential functionality

UAV

Robotics

Automation

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.

mosaic-G5 P1

mosaic
Your positioning cornerstone

septentrio
part of HEXAGON

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

PERFORMANCE

RTK performance [1,2,3]

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

Other positioning modes accuracy [1,2]

	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 [4]

<10 ms

Time precision

PPS resolution 1.4 ns

Time to first fix

Cold start[5]	< 35 s
Warm start[6]	< 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 Build-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

[1] Open sky conditions
[2] RMS levels
[3] Baseline <40 km
[4] 99.9%
[5] No information available (no almanac, no approx position)
[6] Ephemeris and approx. position known

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