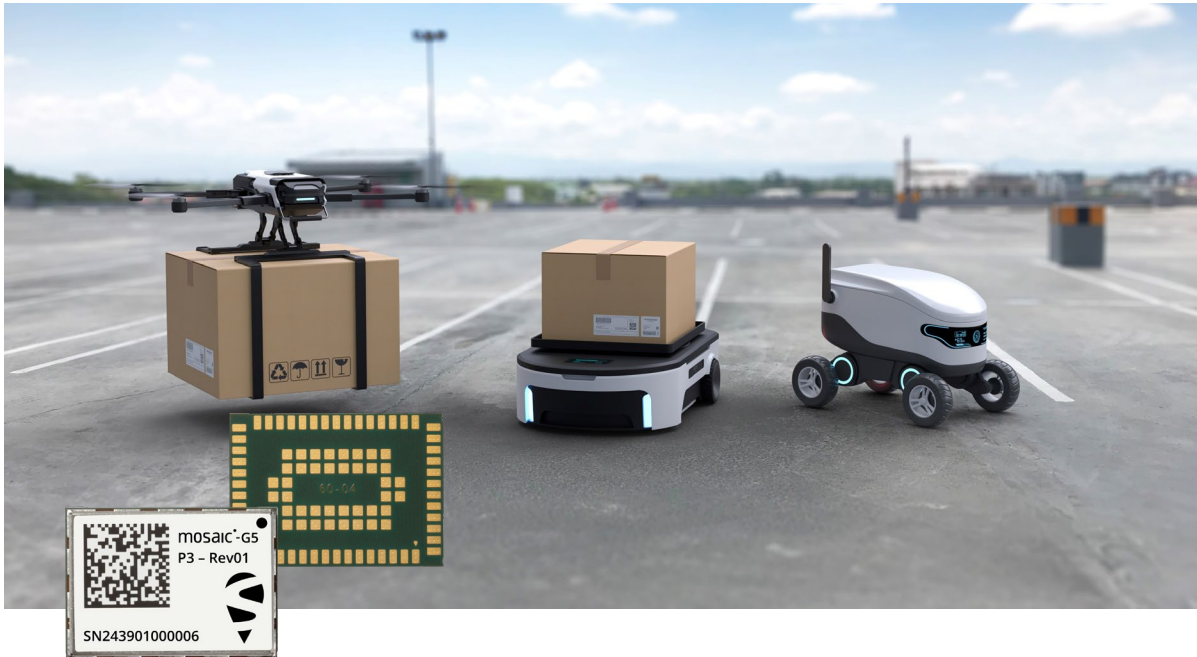


mosaic-G5 P3/P3H

High-precision GNSS receiver module with heading capability



Septentrio mosaic-G5 P3™ & mosaic-G5 P3H™ are advanced multi-frequency GNSS receiver modules in a low-power surface mount package. The mosaic-G5 P3H™ offers heading and pitch or heading and roll angles in addition to high-accuracy positioning, ideal for autonomous navigation. With GNSS+ technology for resilience and reliability, Septentrio is now offering a performance benchmark in mass market GNSS positioning.

KEY FEATURES

- ▶ Small size, advanced functionality
- ▶ All-in-view satellite tracking: multi-constellation, quad-band GNSS receiver
- ▶ Best-in-class RTK centimeter-level positioning
- ▶ Dual antenna heading with mosaic-G5 P3H™
- ▶ Industry-leading ultra-low power consumption

BENEFITS

Excellent size-to-performance ratio

Sized at only 22.8 x 16.4 mm, mosaic-G5 P3™ has market-leading ultra-low power consumption. It offers full raw data with positioning measurements (P3 only) and Galileo HAS positioning service compatibility¹. It is ideal for drones, robots, autonomous systems and space-constrained devices which require accurate positioning with a high degree of reliability.

Designed for automated assembly

The mosaic-G5 P3™ and mosaic-G5 P3H™ modules are designed for high-volume automated assembly lines and come with a comprehensive set of interfaces. 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+** Advanced functionality with jamming and spoofing detection and automatic mitigation.
- ▶ **LOCK+** for robust tracking during high vibrations and shocks.
- ▶ **APME+** multipath mitigation to disentangle direct signal and those reflected from nearby structures.
- ▶ **IONO+** 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, B2I, B2b, B3I
- ▶ Galileo: E1, E5a, E5b, E6
- ▶ QZSS: L1C/A, L1 C/B, L2C, L5, L6⁸

GNSS Heading (P3H only)

Galileo High Accuracy Service (HAS)¹

Galileo OSNMA

Full raw measurement data (P3 only)

5 constellations RTK (rover)

Septentrio's patented GNSS+ technologies

- ▶ **AIM+ Advanced** functionality with jamming and spoofing detection automatic interference mitigation
- ▶ **APME+** a posteriori multipath estimator for code and phase multipath mitigation
- ▶ **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations
- ▶ **IONO+** 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) 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

2 Event markers

PERFORMANCE

RTK performance^{2,3,4}

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

Other positioning modes accuracy^{2,3}

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

Velocity accuracy 3 cm/s

GNSS attitude accuracy (P3H only)^{2,3}

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

Maximum update rate

Position	20 Hz
Measurements only (P3 only)	20 Hz

Latency⁵ <10 ms

Time precision

PPS resolution	1.4 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 P3 0.44 W typ/0.57 Max

Dual Antenna (P3H only) 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

MIL-STD-810H 514.8 - Category 4
MIL-STD-810H 516.8 - Procedure I

Certification CE, FCC, RoHS, WEEE, ISED



¹ Future-proof feature which will be roll out by regular software updates

² Open sky conditions

³ RMS levels

⁴ Baseline <40 km

⁵ 99.9%

⁶ No information available (no almanac, no approx. position)

⁷ Ephemeris and approx. position known

⁸ Will be rolled out via software updates

EMEA

Greenhill Campus (HQ)
Interleuvenlaan 15i
3001 Leuven, Belgium

Espoo, Finland

Americas

2601 Airport Drive,
Suite 360
Torrance, CA 90505, USA

septentrio.com/contact

Asia-Pacific

Shanghai, China
Yokohama, Japan
Seoul, Korea

septentrio.com



mosaic-G5 P3



mosaic-G5 P3H