H-RTK Mosaic-G5

Overview & Specifications

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The Holybro mosaic-G5 is a cutting-edge RTK GPS module that harnesses the power of Septentrio's elite mosaic-G5 GNSS receiver. It comes with an RM3100 magnetometer, two high-performance antennas, and an aluminum CNC enclosure. It offers heading and pitch or heading and roll angles in addition to high-accuracy positioning, ideal for autonomous navigation.

With its dual-antenna input, mosaic-G5 can provide compass-less YAW information to the controller (commonly called GPS Heading or Moving Baseline Yaw). Employing GPS as the yaw source instead of a traditional compass eliminates the inaccuracies caused by magnetic interference from vehicle motors, electrical systems, and environmental sources like metallic structures or power lines, ensuring precise yaw reports to the controller and enhancing overall navigation reliability and performance in challenging environments.

Septentrio's mosaic-G5 GNSS receiver module boasts a suite of proprietary technologies that set it apart from the competition. Septentrio’s AIM+ (Advanced Interference Mitigation) technology safeguards against intentional and unintentional jamming sources, ensuring consistent and reliable performance even in challenging RF environments.

Septentrio’s LOCK+ technology ensures optimal tracking even under rapid antenna displacement in the event of high vibrations or shocks, maintaining high accuracy and stable operation in high-dynamic situations. It is ideal for demanding applications such as UAVs and robotics. Furthermore, Septentrio's advanced RAIM+ (Receiver Autonomous Integrity Monitoring) algorithm delivers unmatched integrity and reliability, providing a safety net for mission-critical applications.

Features

- Compact size
- Low power consumption
- Multi-constellation, quad-band GNSS
- Dual antenna heading with triple band GNSS
- Best-in-class RTK accuracy

- Advanced Septentrio GNSS+ algorithm

Specification

Product	Holybro H-RTK Mosaic-G5	
Application	Rover Moving Baseline Rover	
GNSS	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, L6	
RTK performance	Horizontal accuracy 0.6 cm + 0.5 ppm Vertical accuracy 1 cm + 1 ppm	
Positioning accuracy:		
Mode	*Horizontal*	*Vertical*
Standalone	*1.2m*	*1.9m*
DGNSS	*0.4m*	*0.7m*
RTK	*0.6cm+0.5ppm*	*1.0cm+1ppm*
GNSS attitude accuracy:		
Antenna Separation	*Heading*	*Pitch/Roll*
1m	*0.15°*	*0.25°*
5m	*0.03°*	*0.05°*
Time to first fix	Cold start: ≤ 35s Warm start: ≤ 10s Re-acquisition: 1 s	
Latency	< 10 ms	
Magnetometer (Compass)	RM3100	
Antennas Peak Gain (MAX)	2dBi	
LNA Gain	33±2dB	
Time precision	PPS resolution: 1.4 ns Event accuracy: < 3 ns	
Maximum update rate	Position: 20Hz	
Ports	Port 1: USB Type-C Port 2: UART1 (GH1.25 10pin) Port 3: UART2 (GH1.25 6pin)	
Antenna Connection Type	Board: SMA female Antenna: SMA male	

Baud rate: (Adjustable)	230400 5Hz default	
Working voltage:	4.75V~5.25V	
Power Consumption	1.4 W typ(without antennas) 1.8 W max	
Operating Temperature	-40℃ to 85℃	
Dimension	Board: 48*52.3*22mm Antenna Diameter: 40mm Antenna height: 76mm	
Weight	48.5g (without antennas)	
Advanced Technologies inside	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 the direct signal and those reflected from nearby structures IONO+ protection against ionospheric disturbances	

Quick Start Guide

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> **i Info**
>
> Ardupilot & PX4 setup process is identical to the H-RTK mosaic-H. The only difference is that mosaic-G5 currently cannot operate as a base unit.

{% content-ref url="/pages/YOHs8uzlO9LFl9uoCXlR" %} Setup & Getting Started (Ardupilot) {% endcontent-ref %}

{% content-ref url="/pages/FpdWXIEKGh2j5NsXR8yi" %} Setup & Getting Started (PX4) {% endcontent-ref %}

Pinouts

Pinouts

> [Image — to be added]

Dimensions

Dimensions

> [Image — to be added]

Comparison Between mosaic-H & mosaic-G5 P3H

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	mosaic-H	mosaic-G5 P3H
Bands supported	GPS: L1, L2 Galileo: E1, E5b GLONASS: L1, L2 Beidou: B1, B2, B3 QZSS: L1C/A, L1C/B, L2 SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1)	GPS: L1C/A,L1C, L2C, L2P(Y), L5 Galileo: E1, E5a, E5b, E6 GLONASS: L1CA, L2CA, L2P, L3CDMA Beidou: B1I, B1C, B2a, B2I, B2b, B3I QZSS: L1C/A, L1C/B, L2C, L5, L6
RTK Performance	Horizontal: 0.6cm + 0.5ppm Vertical: 1cm + 1ppm	Horizontal: 0.6cm + 0.5ppm Vertical: 1cm + 1ppm
Other Positioning Modes Accuracy	Standalone: 1.2m DGNSS: 0.4m SBAS: 0.6m	Standalone: 1.2m DGNSS: 0.4m
Velocity Accuracy	3cm/s	3cm/s
Heading accuracy	0.15deg (1m baseline)	0.15deg (1m baseline)
Maximum update rate	Measurements only: 100Hz Standalone: 50Hz RTK: 20Hz	20Hz
latency	<10ms	<10ms
Acquisition	33dBHz	30dBHz
Time Precision	PPS resolution: 1.4ns Event accuracy: <3ns	PPS resolution: 5ns Event accuracy: <20ns

	mosaic-H	mosaic-G5 P3H
Anti-jamming and anti-spoofing	AIM+ the most advanced anti-jamming, anti-spoofing on-board interference mitigation technology on the market (narrow and wide band, chirp jammers). LOCK+ for robust tracking during high vibrations and APME+ multipath mitigation to disentangle direct signal and those reflected from nearby IONO+ provides advanced protection against ionospheric	AIM+ the most advanced anti-jamming, anti-spoofing on-board interference mitigation technology on the market (narrow and wide band, chirp jammers). LOCK+ for robust tracking during high vibrations and APME+ multipath mitigation to disentangle direct signal and those reflected from nearby IONO+ provides advanced protection against ionospheric
OSNMA Support	Yes	No
Base/Rover	Base and Rover	Rover only
Protocols	NMEA, SBF, RINEX, RTCM, CMR	NMEA, SBF, RTCM input
Web interface and Ethernet	Yes	No
RAW data	Yes	No

Supported Firmware

Supported Firmware

PX4

- Supported in Stable 1.14.0 and later

Ardupilot

- Supported in Ardupilot
- **Note:** Dual-antenna heading is only supported in Ardupilot 4.5.0 and later.

Download

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RXTools

{% content-ref url="/pages/UBslkQEAkWAHjY76XmWs" %} Download {% endcontent-ref %}

> **i Info**
>
> For the latest RXTool and manual, please visit Septentrio's website:
> https://www.septentrio.com/en/products/gps-gnss-receiver-software/rxtools