

IMU- μ IMU-IC

High performing MEMS IMU combines with SPAN GNSS+INS technology from Hexagon | NovAtel to provide 3D position, velocity and attitude solution



World-leading GNSS+INS technology

SPAN GNSS+INS technology brings together two different but complementary technologies: Global Navigation Satellite Systems (GNSS) positioning and inertial navigation. The absolute accuracy of GNSS positioning and the stability of Inertial Measurement Unit (IMU) gyro and accelerometer measurements are deeply coupled to provide an exceptional 3D navigation solution that is stable and continuously available, even through periods when satellite signals are blocked.

Overview

The μ IMU features Northrop Grumman Litef GmbH's proven inertial measurement technology offering exceptional performance when paired with a NovAtel SPAN enabled receiver. The μ IMU interfaces with receivers from NovAtel through a highly reliable IMU interface. IMU measurements are used by the SPAN enabled receiver to compute a blended GNSS+INS position, velocity and attitude solution at up to 200 Hz. Small size, low weight and power consumption makes the μ IMU ideal for heading reference, flight control and stabilization applications.

The IMU- μ IMU-IC is available as a complete assembly in an environmentally sealed enclosure that can be easily paired with a SPAN enabled GNSS receiver. The μ IMU is also available as a stand alone OEM product.

Improve IMU- μ IMU accuracy

SPAN GNSS+INS technology provides your choice of accuracy and performance, from decimetre to RTK-level positioning. For more demanding applications, Waypoint Inertial Explorer post-processing software can be used to post-process real-time data to offer the highest level of accuracy with the system.

Benefits

- High performance IMU
- Optimal for aerial, hydrographic survey and industrial applications
- Easy integration with SPAN capable GNSS+INS receivers from NovAtel
- Commercially exportable
- Rugged design ideal for challenging environments
- Ideal for a control reference system

Features

- MEMS gyros and accelerometers
- Stationary INS alignment capable
- IMU data rate: 200 Hz
- Enclosure comes with optional wheel sensor input
- SPAN GNSS+INS capability with configurable application profiles

IMU performance¹

Gyroscope performance

Technology	MEMS
Dynamic range	499 °/s
Bias instability ²	6 °/hr
Angular random walk ²	0.12 °/√hr

Accelerometer performance

Technology	MEMS
Dynamic range	15 g
Bias instability ²	3 mg
Velocity random walk ²	0.15 m/s/√hr

Physical and electrical

Dimensions	130 x 130 x 115 mm
Weight	2.57 kg
Power	
Input voltage	+10 to +34 VDC
Power consumption	11 W (typical)
Connectors	
Power	SAL M12, 5 pin, male
Data	SAL M12, 4 pin, female
Wheel sensor	SAL M12, 8 pin, male
Communication interface	RS-422 UART
Connection to receiver	Receiver serial port
Data rate	
IMU raw data rate	200Hz
INS solution	Up to 200 Hz

Environmental

Temperature	
Operating	-40°C to +55°C
Storage	-40°C to +80°C
Humidity	MIL-STD-810G(Ch1), Method 507.6
Random vibrate	MIL-STD-810G(CH1), Method 514.7 (2.0g)
Environment	MIL-STD-810G(Ch1), Method 512.6 (IEC 60529 IP67)

Compliance

FCC, ISED, CE

Included accessories

- Power cable
- Communication cable
- Wheel sensor cable

Optional accessories

- Mounting plate

Performance during GNSS outages^{3,4,5}

Outage duration	Positioning mode	Position accuracy (m) RMS		Velocity accuracy (m/s) RMS		Attitude accuracy (degrees) RMS	
		Horizontal	Vertical	Horizontal	Vertical	Roll/Pitch	Heading
0 s	RTK ⁶	0.02	0.03				
	TerraStar-C PRO PPP	0.025	0.05	0.015	0.010	0.010	0.030
	Single point	1.00	0.60				
10 s	RTK ⁶	0.12	0.11				
	TerraStar-C PRO PPP	0.12	0.13	0.035	0.015	0.017	0.038
	Single point	1.10	0.68				
60 s	RTK ⁶	3.50	0.78				
	TerraStar-C PRO PPP	3.50	0.80	0.165	0.022	0.025	0.050
	Single point	4.50	1.35				
	RTK with Land profile and DMI	2.50	0.78	0.115	0.022	0.025	0.050
0 s	Post-Processed using Inertial Explorer	0.01	0.02	0.010	0.010	0.004	0.015
10 s		0.01	0.02	0.010	0.010	0.004	0.015
60 s		0.16	0.04	0.020	0.010	0.005	0.016

1. Supplied by IMU manufacturer.

2. Lifetime maximum.

3. Performance may be impacted in conditions with unmitigated vibration or significant temperature variations.

4. Performance with one antenna, no DMI, and default SPAN profile unless otherwise specified.

5. Typical. Based on mixed urban road vehicle dynamics and benign GNSS conditions.

6. 1 ppm should be added to all values to account for additional error due to baseline length.

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