IMU-µIMU-IC

High Performing MEMS IMU Combines With SPAN Technology by Hexagon | NovAtel to Provide 3D Position, Velocity and Attitude Solution

SPAN: World-Leading GNSS+INS Technology

Synchronized Position and Attitude Navigation (SPAN) 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 tightly coupled to provide an exceptional 3D navigation solution that is stable and continuously available, even through periods when satellite signals are blocked.

Overview

The µIMU features Northrop Grumman Litef GmbH's proven inertial measurement technology offering exceptional performance when paired with a NovAtel SPAN enabled receiver. The µIMU interfaces with NovAtel receivers through a highly reliable IMU interface. IMU measurements are used by the SPAN 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 µIMU ideal for heading reference, flight control and stabilization applications.

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

Improve SPAN Accuracy

SPAN technology by NovAtel provides your choice of accuracy and performance, from decimeter to RTK-level positioning. For more demanding applications, Inertial Explorer® post-processing software from our Waypoint® Product Group can be used to post-process SPAN IMU-µIMU 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 NovAtel's SPAN capable GNSS+INS receivers
- Commercially exportable
- Ideal for a control reference system

Features

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

SPAN System Performance[1]

Horizontal Position Accuracy (RMS)

Single point L1/L2	1.2 m
SBAS[2]	60 cm
DGPS	40 cm
TerraStar-L[3,4]	40 cm
TerraStar-C PRO[3,4]	2.5 cm
TerraStar-X[3,4]	2 cm
RTK	1 cm +1 ppm

Data Rate

IMU Raw Data Rate	200Hz
INS Solution	Up to 200 Hz

Time Accuracy[5] 20 ns RMS

Max Velocity[6] 515 m/s

IMU Performance[7]

Gyroscope Performance

Input range	±499 deg/sec
Bias stability	≤6 deg/hr
Scale factor error	≤1400 ppm
Angular random walk	≤0.3 deg/√hr

Accelerometer Performance

Range	8 ±15 g
Bias repeatability	≤3 mg
Scale factor error	≤1500 ppm
Velocity random walk	≤0.25 mg/√Hz

Physical and Electrical

Dimensions 130 x 130 x 115 mm

Weight 2.57 kg

Power

Power consumption	11 W (typical)
Input voltage	+10 to +34 V

Connectors

Power	SAL M12, 5 pin, male
Data	SAL M12, 4 pin, female
Wheel sensor	SAL M12, 8 pin, male

Environmental

Temperature

Operating	-40°C to +55°C
Storage	-40°C to +80°C

Humidity MIL-STD-810G(Ch1), Method 507.6

Random Vibe MIL-STD-810G(CH1), Method 514.7 (2.0g)[8]

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
- Inertial Explorer post-processing software

PERFORMANCE DURING GNSS OUTAGES[1,9]

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[10]	0.02	0.03	0.015	0.010	0.010	0.010	0.030
	PPP	0.06	0.15					
	SP	1.00	0.60					
	Post-Processed[11]	0.01	0.02	0.010	0.010	0.005	0.005	0.009
10 s	RTK[10]	0.12	0.11	0.035	0.015	0.017	0.017	0.038
	PPP	0.16	0.23					
	SP	1.10	0.68					
	Post-Processed[11]	0.01	0.02	0.010	0.010	0.005	0.005	0.009
60 s	RTK[10]	3.52	0.78	0.165	0.022	0.025	0.025	0.050
	PPP	3.56	0.90					
	SP	4.50	1.35					
	Post-Processed[11]	0.15	0.05	0.020	0.010	0.006	0.006	0.010

1. Typical values. Performance specifications subject to GNSS system characteristics, Signal-in-Space (SIS) operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference. 2. GPS-only. 3. Requires subscription to TerraStar data service. Subscriptions available from NovAtel. 4. TerraStar service available depends on the SPAN receiver used. See the receiver product sheet for details. 5. Time accuracy does not include biases due to RF or antenna delay. 6. Export licensing restricts operation to a maximum of 515 meters/second. 7. Supplied by IMU manufacturer. 8. GNSS receiver sustains tracking up to 4 g. 9. Steady state and outage performance remains the same for the -L model. 10. 1 ppm should be added to all values to account for additional error due to baseline length. 11. Post-processing results using Inertial Explorer software.

Contact Hexagon | NovAtel

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