IMU-ISA-100C

High performance tactical grade IMU combines with SPAN technology from Hexagon | NovAtel to deliver 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 System (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 IMU-ISA-100C features Northrop-Grumman Litef GMBH's proven inertial measurement technology offering exceptional performance when paired with a NovAtel SPAN enabled receiver. A near navigation grade sensor, the IMU-ISA-100C contains fiber optic gyros and fully temperature compensated Micro Electromechanical Systems (MEMS) accelerometers. The IMU-ISA-100C operates from 10-34 VDC and interfaces with a receiver 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 rates up to 200 Hz.

Advantages Of IMU-ISA-100C

The IMU-ISA-100C offers extremely high performance and precise accuracy at an affordable price point. It is commercially exportable and offers an ideal solution for applications such as platform stabilization, general purpose navigation, photogrammetry, remote sensing and ground mobile mapping.

Improve IMU-ISA-100C accuracy

Receivers from NovAtel provide 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 on the IMU-ISA-100C for the highest level of system accuracy.

Benefits

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

Features

- Low noise fiber optic gyros and MEMS 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

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 [5]

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

Time Accuracy [6]	20 ns RMS
Max Velocity [7]	515 m/s

IMU Performance [8]

Gyroscope Performance

Input range	±495 deg/sec
In-run bias stability	≤0.05 deg/hr
Scale factor repeatability	≤100 ppm
Scale factor non-linearity	≤100 ppm
Angular random walk	0.012 deg/√hr

Accelerometer Performance

Range [9]	±10 g
In-run bias stability	≤100 µg
1 year scale factor repeatability	≥1250 ppm
Scale factor non-linearity	≤100 ppm
Velocity random walk	≤100 µg/√Hz

Physical and Electrical

Dimensions	180 x 150 x 137 mm
Weight	5.0 kg

Power

Power consumption	18 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	-40ºC to +55ºC
Storage	-40ºC to +85ºC
Humidity	MIL-STD-810G, Method 507.5
Random Vibe	MIL-STD-810G, Method 514.6 (2.0 g)
MTBF	>46,100 hrs
Environment	IEC 60529 IP67

Compliance

FCC, ISED, CE

Included Accessories

- Power cable
- Communication cable
- Wheel sensor cable

Optional Accessories

- Inertial Explorer post-processing software

Performance During GNSS Outages [1,10]

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 [11]	0.02	0.03	0.008	0.008	0.006	0.006	0.010
	PPP	0.06	0.15					
	SP	1.00	0.60					
	Post-Processed [12]	0.01	0.02	0.008	0.008	0.003	0.003	0.004
10 s	RTK [11]	0.08	0.08	0.013	0.013	0.008	0.008	0.013
	PPP	0.12	0.20					
	SP	1.06	0.65					
	Post-Processed [12]	0.01	0.02	0.008	0.008	0.003	0.003	0.004
60 s	RTK [11]	0.92	0.53	0.048	0.023	0.009	0.009	0.018
	PPP	0.96	0.65					
	SP	1.90	1.10					
	Post-Processed [12]	0.04	0.02	0.009	0.008	0.003	0.003	0.004

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 a subscription to TerraStar data service. Subscriptions available from NovAtel. 4. TerraStar service available depends on the SPAN enabled receiver used. See the receiver product sheet for details. 5. 400 Hz data is an optional configuration. Contact NovAtel for details. 6. Time accuracy does not include biases due to RF or antenna delay. 7. Export licensing restricts operation to a maximum of 515 metres/second. 8. Supplied by IMU manufacturer. 9. GNSS receiver sustains tracking up to 4 g. 10. Ground Mobile Operating Environment. 11. 1 ppm should be added to all values to account for additional error due to baseline length. 12. Post-processing results using Inertial Explorer software.

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