

# IMU-ISA-100C

High Performance Tactical Grade IMU Combines With SPAN Technology by Hexagon | NovAtel to Deliver 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 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 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 IMU-ISA-100C features Northrop-Grumman Litef GMBH's proven inertial measurement technology offering exceptional performance when paired with a NovAtel SPAN 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 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 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 SPAN IMU-ISA-100C Accuracy

NovAtel receivers provide your choice of accuracy and performance, from decimeter to RTK-level positioning. For more demanding applications, Inertial Explorer® post-processing software from our Waypoint® Products Group can be used to post-process SPAN IMU-ISA-100C data 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
- Ideal for a control reference system

## Features

- Low noise fiber optic 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<sup>1</sup>**

**Horizontal Position Accuracy (RMS)**

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

**Data Rate<sup>5</sup>**

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

**Time Accuracy<sup>6</sup>** 20 ns RMS

**Max Velocity<sup>7</sup>** 515 m/s

**IMU Performance<sup>8</sup>**

**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 <sup>9</sup>	±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	-40°C to +55°C
Storage	-40°C to +85°C

**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, ISCED, CE

**Included Accessories**

- Power cable
- Communication cable
- Wheel sensor cable

**Optional Accessories**

- Inertial Explorer post-processing software

**Performance During GNSS Outages<sup>1,10</sup>**

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 <sup>11</sup>	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 <sup>12</sup>	0.01	0.02					
10 s	RTK <sup>11</sup>	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 <sup>12</sup>	0.01	0.02					
60 s	RTK <sup>11</sup>	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 <sup>12</sup>	0.04	0.02					

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 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 meters/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.

Contact Hexagon | NovAtel

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