

# 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 SPAN enabled receiver from NovAtel. 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 for the highest level of system accuracy.

## Benefits

- Premium 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

- Low noise fibre 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

**IMU performance<sup>1</sup>**

**Gyroscope performance**

Technology	FOG
Dynamic range	495 °/s
Bias instability <sup>2</sup>	0.05 °/hr
Angular random walk (typical) <sup>2</sup>	0.005 °/√hr

**Accelerometer performance**

Technology	MEMS
Dynamic range	10 g
Bias instability <sup>2</sup>	0.1 mg
Velocity random walk (typical) <sup>2</sup>	0.018 m/s/√hr

**Physical and electrical**

<b>Dimensions</b>	180 x 150 x 137 mm
<b>Weight</b>	5.0 kg
<b>Power</b>	
Input voltage	+10 to +34 VDC
Power consumption	18 W (typical)
<b>Connectors</b>	
Power	SAL M12, 5 pin, male
Data	SAL M12, 4 pin, female
Wheel sensor	SAL M12, 8 pin, male
<b>Communication interface</b>	RS-422 UART
<b>Connection to receiver</b>	Receiver serial port
<b>Data rate<sup>3</sup></b>	
IMU raw data rate	200 Hz
INS solution	Up to 200 Hz

**Environmental**

<b>Temperature</b>	
Operating	-40°C to +55°C
Storage	-40°C to +85°C
<b>Humidity</b>	MIL-STD-810G, Method 507.5
<b>Random Vibe</b>	MIL-STD-810G, Method 514.6 (2.0 g)
<b>MTBF</b>	>46,100 hrs
<b>Environment</b>	IEC 60529 IP67

**Compliance**

FCC, ISED, CE

**Included accessories**

- Power cable
- Communication cable
- Wheel sensor cable

**Performance during GNSS outages<sup>4, 5, 6</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>7</sup>	0.02	0.03				
	TerraStar-C PRO PPP	0.025	0.05	0.008	0.008	0.006	0.010
	Single point	1.00	0.60				
10 s	RTK <sup>7</sup>	0.08	0.08				
	TerraStar-C PRO PPP	0.08	0.10	0.013	0.013	0.008	0.013
	Single point	1.06	0.65				
60 s	RTK <sup>7</sup>	0.90	0.53				
	TerraStar-C PRO PPP	0.90	0.55	0.048	0.023	0.009	0.018
	Single point	1.90	1.10				
	RTK with Land profile and DMI	0.90	0.53	0.048	0.023	0.009	0.018
0 s	Post-Processed using Inertial Explorer	0.01	0.02	0.008	0.008	0.003	0.004
10 s		0.01	0.02	0.008	0.008	0.003	0.004
60 s		0.04	0.02	0.009	0.008	0.003	0.004

1. Supplied by IMU manufacturer.  
 2. From room temperature Allan variance method.  
 3. 400 Hz data is an optional configuration. Contact NovAtel for details.  
 4. Performance may be impacted in conditions with unmitigated vibration or significant temperature variations.

5. Performance with one antenna, no DMI, and default SPAN profile unless otherwise specified.  
 6. Typical. Based on mixed urban road vehicle dynamics and benign GNSS conditions.  
 7. 1 ppm should be added to all values to account for additional error due to baseline length.

**Contact Hexagon | NovAtel**

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