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# SPAN<sup>®</sup> IMU-ISA-100C

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HIGH PERFORMANCE TACTICAL GRADE IMU COMBINES WITH NOVATEL'S GNSS TECHNOLOGY TO DELIVER 3D POSITION, VELOCITY AND ATTITUDE SOLUTION

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## SPAN: WORLD-LEADING GNSS+INS TECHNOLOGY

NovAtel's Synchronous Position, Attitude and 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's FlexPak6™ or ProPak6™ 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

Take advantage of NovAtel CORRECT™ to receive your choice of accuracy and performance, from decimetre 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.

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## BENEFITS

- + High performance IMU
- + Commercially exportable
- + Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- + Ideal for aerial and hydrographic survey as well as industrial applications

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## FEATURES

- + Low noise fiber optic gyros and MEMS accelerometers
  - + 200 Hz data rate
  - + SPAN INS functionality
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# IMU-ISA-100C

## SPAN SYSTEM PERFORMANCE<sup>1</sup>

### Horizontal Position Accuracy (RMS)

Single point L1/L2	1.2 m
NovAtel CORRECT™	
» SBAS <sup>2</sup>	60 cm
» DGPS	40 cm
» PPP <sup>3, 4</sup>	4 cm
» RTK	1 cm + 1 ppm

### Data Rate<sup>5</sup>

IMU measurements	200 Hz
INS position	200 Hz
INS velocity	200 Hz
INS attitude	200 Hz

### Time Accuracy<sup>6</sup>

20 ns RMS
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### Max Velocity<sup>7</sup>

515 m/s
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## IMU PERFORMANCE<sup>8</sup>

### Gyroscope Performance

Input range	±495 deg/sec
Bias stability	≥0.5 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
Bias repeatability	≥1250 µg
Scale factor repeatability	≤100 ppm
Scale factor non-linearity	≤100 ppm
Velocity random walk	≤100 µg/√hr

## 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

## INCLUDED ACCESSORIES

- Power cable
- Communication cable
- Wheel sensor cable

## OPTIONAL ACCESSORIES

- Inertial Explorer post-processing software



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Version 5 Specifications subject to change without notice.

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## PERFORMANCE DURING GNSS OUTAGES<sup>1,10</sup>

Outage Duration	Positioning Mode	POSITION ERROR (M)		VELOCITY ERROR (M/S)		ATTITUDE ERROR (DEGREES)		
		Horizontal	Vertical	Horizontal	Vertical	Roll	Pitch	Heading
0 s	RTK <sup>11</sup>	0.02	0.05	0.010	0.010	0.007	0.007	0.010
	PPP	0.06	0.15	0.010	0.010	0.007	0.007	0.010
	SP	1.20	0.60	0.010	0.010	0.007	0.007	0.010
	PP <sup>12</sup>	0.01	0.02	0.010	0.010	0.003	0.003	0.004
10 s	RTK <sup>11</sup>	0.07	0.10	0.015	0.015	0.008	0.008	0.012
	PPP	0.11	0.20	0.015	0.015	0.008	0.008	0.012
	SP	1.25	0.65	0.015	0.015	0.008	0.008	0.012
	PP <sup>12</sup>	0.01	0.02	0.010	0.010	0.003	0.003	0.004
60 s	RTK <sup>11</sup>	0.72	0.45	0.035	0.025	0.009	0.009	0.015
	PPP	0.76	0.55	0.035	0.025	0.009	0.009	0.015
	SP	1.90	1.00	0.035	0.025	0.009	0.009	0.015
	PP <sup>12</sup>	0.04	0.02	0.030	0.010	0.003	0.003	0.004

1. Typical values. Performance specifications subject to GPS system characteristics, US DOD operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources.

2. GPS-only.

3. Requires subscription to TerraStar data service. Subscriptions available from NovAtel.

4. An OEM628, OEM638, FlexPak6 or ProPak6 receiver is required.

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.

