



## Tactical Grade, Low Noise IMU Delivers 3D Position, Velocity and Attitude Solution as Part of NovAtel's SPAN Technology

### Benefits

35,000 hour MTBF

No export approval required for  
most countries and applications

Easy integration with a NovAtel  
SPAN-capable GNSS/INS receiver

### Features

Closed loop fiber optic gyros and  
servo accelerometers

200 Hz data rate

Wheel encoder input capability

### GNSS+INS Solution Unlike Any Others

NovAtel's SPAN (Synchronous Position, Attitude and Navigation) technology brings together two different, but complementary technologies: GPS positioning and inertial navigation. The absolute accuracy of GPS 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 GPS signals are blocked.

### IMU-FSAS Overview

The IMU-FSAS is a tactical-grade IMU from iMAR GmbH. The custom NovAtel interface of the IMU integrates easily into a NovAtel SPAN-enabled GNSS/INS receiver such as the Propak® or SPAN-SE. IMU measurements are sent from the IMU-FSAS to the GNSS/INS receiver where a blended GNSS/INS position, velocity and attitude solution is generated at up to 200 Hz. An optional interface for magnetic or optical-encoder style wheel sensors is available for ground applications.

### Advantages of IMU-FSAS

The low noise and stable biases of the accelerometer and gyro sensors mean that the IMU is well suited for ground or airborne survey applications or general positioning and navigation in locations where standard GNSS receivers are not sufficient. For commercial applications, the IMU-FSAS does not require formal export authorization from Germany or Canada.

If you require more information about our SPAN IMUs,  
visit [improveyourgps.com](http://improveyourgps.com)



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**SPAN System Performance<sup>1</sup>****Position Accuracy (RMS)**

Single Point L1	1.8 m
Single Point L1/L2	1.5 m
SBAS	0.6 m
DGPS	0.45 m
OmniSTAR	
VBS	0.7 m
XP	0.15 m
HP	0.1 m
RT-20™ <sup>2</sup>	0.2 m
RT-2™	1 cm+1 ppm

**Velocity Accuracy**      **0.02 m/s RMS**  
(nominal)

**Attitude Accuracy<sup>3</sup>**

Pitch	0.015° RMS
Roll	0.015° RMS
Azimuth	0.041° RMS

**Acceleration Accuracy**

**0.03 m/s<sup>2</sup> RMS**

**Max Velocity<sup>4</sup>**

**515 m/s**

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

IMU Measurements	200 Hz
INS Position	200 Hz
INS Velocity	200 Hz
INS Attitude	200 Hz

**IMU Performance****IMU-FSAS-EI-SN**

Gyro Input Range	±500 deg/sec
Gyro Rate Bias	<0.75 deg/hr
Gyro Rate Scale Factor	300 ppm
Angular Random Walk	0.1 deg/√hr
Accelerometer Range <sup>6</sup>	±5 g
Accelerometer Scale Factor	300 ppm
Accelerometer Bias	1.0 mg

**IMU Physical and Electrical**

**Dimensions**      **128 x 128 x 104 mm**

**Weight**                      **2.1 kg**

**Power**

Power Consumption	16 W (max)
Input Voltage	+11 to 34 V

**Input/Output Connectors**

MIL-C-38999-III, 22 pin

**Environmental**

Temperature	
Operating	-40°C to +71°C
Storage	-40°C to +85°C
Humidity	95% non-condensing

**MTBF**                      **35,000 hrs**

**Performance During GNSS Outages<sup>7</sup>**

Outage Duration	Positioning Mode	Position Error (m)		Velocity Error (m/s)		Attitude Error (degrees)		
		Horizontal	Vertical	Horizontal	Vertical	Roll	Pitch	Yaw
10 s	RTK	0.013	0.03	0.018	0.008	0.006	0.007	0.009
	DGPS	0.30	0.28	0.026	0.006	0.007	0.009	0.024
	SP	1.24	1.51	0.028	0.008	0.008	0.010	0.025
30 s	RTK	0.83	0.16	0.055	0.008	0.009	0.010	0.017
	DGPS	1.01	0.41	0.059	0.007	0.010	0.012	0.026
	SP	1.60	1.55	0.062	0.010	0.010	0.016	0.028
60 s	RTK	3.42	0.44	0.129	0.013	0.012	0.014	0.023
	DGPS	3.62	0.69	0.128	0.013	0.012	0.015	0.030
	SP	3.95	1.65	0.131	0.014	0.012	0.015	0.032



Version 3 - Specifications subject to change without notice.

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For the most recent details of this product:  
[novatel.com/Documents/Papers/FSAS.pdf](http://novatel.com/Documents/Papers/FSAS.pdf)

<sup>1</sup> 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.

<sup>2</sup> Expected accuracy after static convergence.

<sup>3</sup> When SPAN is in RTK mode.

<sup>4</sup> Export licensing restricts operation to a maximum of 515 metres per second.

<sup>5</sup> If raw IMU measurements are logged (200 Hz), the maximum rate position, velocity, attitude logs that can be requested is 50 Hz.

<sup>6</sup> GNSS receiver sustains tracking up to 4 g.

<sup>7</sup> These are RMS values, computed with respect to a full GPS RTK trajectory.

