

## SPAN MEMS TECHNOLOGY INTEGRATED WITH NOVATEL'S POWERFUL OEM615™ RECEIVER



### SPAN: WORLD LEADING GNSS+INS TECHNOLOGY

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.

### SPAN-IGM-S1 RECEIVER

The SPAN-IGM-S1 features Sensoror's STIM300 MEMS IMU, a compact, high performance sensor with centimetre-level accuracy. Combined with the NovAtel OEM615 receiver, the SPAN-IGM-S1 offers exceptional performance in a small, lightweight, all-in-one package.

This product is commercially exportable and provides the best price/performance/size available in the market.

### ALIGN® ENABLED

Building on NovAtel's successful SPAN-SE-D enclosure, we offer our ALIGN heading solution as an option on the SPAN-IGM-S1. ALIGN can be activated by pairing the SPAN-IGM-S1 with an external ALIGN enabled receiver such as our FlexPak6™.

### IMPROVED ACCURACY

NovAtel CORRECT™ with RTK improves real-time performance and accuracy. For more demanding applications, Inertial Explorer® software from our Waypoint® Products Group can be used to post-process SPAN data to provide the highest level of accuracy.

### BENEFITS

- + SPAN enabled enclosure featuring NovAtel's tightly coupled OEM615 GNSS+INS engine
- + Tactical grade IMU performance
- + Commercially exportable IMU
- + Can be paired with an external receiver to support ALIGN GNSS azimuth aiding for low dynamic applications
- + Small, lightweight and rugged
- + Ideal for airborne, ground and marine applications

### FEATURES

- + Metre to centimetre-level accuracy
- + Regulated 10-30 VDC input
- + 125 Hz navigation solution and raw measurement output
- + Serial, USB, CAN and Multi I/O interface including dedicated wheel sensor input
- + GPS, GLONASS, SBAS and RTK support

If you require more information about our SPAN products, visit [www.novatel.com/span](http://www.novatel.com/span)

# SPAN-IGM-S1™

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

OEM615 SPAN<sup>2</sup> tightly coupled RTK GNSS+INS engine

### Horizontal Position Accuracy (RMS)

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

### Data Rates

GNSS measurement	20 Hz
GNSS position	20 Hz
IMU measurement	125 Hz
INS solution	Up to 125 Hz

**Time Accuracy<sup>4</sup>** 20 ns RMS

**Max Velocity<sup>5</sup>** 515 m/s

## IMU PERFORMANCE<sup>6</sup>

### Gyroscope Performance

Input range	400 deg/sec
Rate bias stability	0.5 deg/h
Angular random walk	0.15 deg/√hr

### Accelerometer Performance

Range	±10 g
Bias stability	0.05 mg
Velocity random walk	0.06 m/s/√hr

## PHYSICAL AND ELECTRICAL

Dimensions 152 × 142 × 51 mm  
Weight 540 g

### Power

Input voltage 10–30 VDC  
Power consumption<sup>7</sup> 6 W

### Antenna LNA Power Output

Output voltage 5 VDC ±5%  
Maximum current 100 mA

### Connectors

Main port & AUX port DB-HD15  
Antenna TNC

## COMMUNICATION PORTS

1 USB	12 Mbps
1 RS-232 or RS-422	
	921,600 bps
1 RS-232	921,600 bps
1 CAN port	1 Mbps

### Inputs/Outputs

2 Event Input triggers  
1 Configurable PPS  
1 Wheel sensor port  
1 VARF

### Status LEDs

Power  
GNSS status  
INS status

## ENVIRONMENTAL

### Temperature

Operating -40°C to +65°C  
Storage -50°C to +80°C

**Humidity** MIL-STD-810G  
95% Non-condensing

### Vibration (operating)

Random MIL-STD-810G (7.7 g)  
Sinusoidal IEC 60068-2-6 (5 g)

**Bump** IEC 60068-2-27 (25 g)

**Shock** MIL-STD-810G (40 g)

**Immersion** IEC 60529 IPX7

**Compliance** FCC, CE,  
Industry Canada

## INCLUDED ACCESSORIES

- Combined power, data and I/O cables

## OPTIONAL ACCESSORIES

- Inertial Explorer post-processing software
- GPS-700 series antenna and RF cables
- NovAtel Connect™ GUI software
- SPAN-IGM bracket kit for ALIGN

## OPTIONAL CONFIGURATION

- Available OEM615 options:
- GLONASS
- ALIGN<sup>8,9</sup>
- Stackable with FlexPak6 for an ALIGN solution (shown)



For the most recent details of this product: [www.novatel.com/products/span-gnss-inertial-systems/span-combined-systems/span-igm-s1/](http://www.novatel.com/products/span-gnss-inertial-systems/span-combined-systems/span-igm-s1/)

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## PERFORMANCE DURING GNSS OUTAGES<sup>1</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>10</sup>	0.02	0.03	0.020	0.010	0.015	0.015	0.080
	SP	1.00	0.60	0.020	0.010	0.015	0.015	0.080
	PP <sup>11</sup>	0.01	0.02	0.020	0.010	0.006	0.006	0.019
10 s	RTK <sup>10</sup>	0.27	0.14	0.051	0.017	0.025	0.025	0.095
	SP	1.22	0.71	0.051	0.017	0.025	0.025	0.095
	PP <sup>11</sup>	0.02	0.02	0.020	0.010	0.007	0.007	0.021
60 s	RTK <sup>10</sup>	6.61	1.46	0.280	0.051	0.044	0.044	0.130
	SP	7.56	2.03	0.280	0.051	0.044	0.044	0.130
	PP <sup>11</sup>	0.22	0.10	0.024	0.011	0.008	0.008	0.024

**Version 5** Specifications subject to change without notice.

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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. For detailed receiver specifications, see NovAtel's OEM615 product sheet and Receiver brochure.  
3. GPS-only.  
4. Time accuracy does not include biases due to RF or antenna delay.  
5. Export licensing restricts operation to a maximum of 515 metres/second.  
6. Supplied by IMU manufacturer.

7. Typical, GPS+GLONASS only, 12 V, 25 °C, without FlexPak6.

8. For additional information on optional configurations, see our firmware options on our web site or contact NovAtel for more information.

9. ALIGN requires a secondary GNSS receiver paired with the SPAN enclosure.

10. 1 ppm should be added to all position values to account for additional error due to baseline length.

11. Post-processing results using Inertial Explorer software. The survey data used to generate these statistics is ground vehicle data collected with frequent changes in azimuth (i.e., as normally observed in ground vehicle environments).

