

## 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 ENABLED MEMS RECEIVER

The SPAN-IGM-A1 delivers world class NovAtel SPAN technology in an integrated, single box solution. The SPAN-IGM-A1 offers tightly coupled GNSS inertial navigation featuring our OEM615 receiver.

The smallest and lightest GNSS+Inertial Navigation System (INS) receiver in our product portfolio, the SPAN-IGM-A1 can be configured from the factory as an integrated GNSS+INS engine or as a standalone IMU sensor for pairing with an existing NovAtel SPAN receiver.

### ALIGN® ENABLED

Building on NovAtel's successful SPAN-SE-D enclosure, we offer our ALIGN heading solution as an option on the SPAN-IGM-A1. ALIGN can be activated by pairing the SPAN-IGM-A1 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
- + Can be paired with an external receiver to support ALIGN GNSS azimuth aiding for low dynamic applications
- + Small, lightweight and rugged

### FEATURES

- + Metre to centimetre-level accuracy
- + Regulated 10-30 VDC input
- + 200 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-A1™

## 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  | 200 Hz       |
| INS solution     | Up to 200 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         | ±450 deg/sec |
| Rate bias stability | 6 deg/h      |
| Angular random walk | 0.30 deg/√hr |

### Accelerometer Performance

|                      |               |
|----------------------|---------------|
| Range                | ±18 g         |
| Bias stability       | 0.1 mg        |
| Velocity random walk | 0.029 m/s/√hr |

## PHYSICAL AND ELECTRICAL

**Dimensions** 152 × 142 × 51 mm

**Weight** 515 g

### Power

|                                |           |
|--------------------------------|-----------|
| Input voltage                  | 10-30 VDC |
| Power consumption <sup>7</sup> | 4 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 CONFIGURATIONS

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-a1/](http://www.novatel.com/products/span-gnss-inertial-systems/span-combined-systems/span-igm-a1/)

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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    | 0.035                           | 0.035 | 0.150   |
|                 | SP                | 1.00                      | 0.60     | 0.020                       | 0.010    | 0.035                           | 0.035 | 0.150   |
|                 | PP <sup>11</sup>  | 0.01                      | 0.02     | 0.020                       | 0.020    | 0.012                           | 0.012 | 0.074   |
| 10 s            | RTK <sup>10</sup> | 0.46                      | 0.13     | 0.100                       | 0.021    | 0.072                           | 0.072 | 0.210   |
|                 | SP                | 1.41                      | 0.70     | 0.100                       | 0.021    | 0.072                           | 0.072 | 0.210   |
|                 | PP <sup>11</sup>  | 0.02                      | 0.02     | 0.020                       | 0.010    | 0.012                           | 0.012 | 0.074   |



Contact NavtechGPS for product details. [www.NavtechGPS.com](http://www.NavtechGPS.com)  
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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 values to account for additional error due to baseline length.  
11. Post-processing results using Inertial Explorer software.

Version 7 Specifications subject to change without notice.

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