

# SPAN<sup>®</sup> UIMU-HG1700



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



## 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.

## UIMU-HG1700 OVERVIEW

The UIMU-HG1700 contains the Honeywell HG1700 IMU. The HG1700 is a tactical grade IMU containing ring-laser gyros and servo accelerometers. The UIMU-HG1700 handles the power requirements of the IMU from a 12-28 VDC power input and provides the IMU data to a SPAN enabled GNSS+INS receiver such as the PwrPak7<sup>®</sup> using a custom NovAtel interface. IMU measurements are used by the GNSS+INS receiver to compute a blended GNSS+INS position, velocity and attitude solution at up to 100 Hz. The HG1700 is a commercial product that can be licensed under the U.S. Department of Commerce for customers outside the United States.

## ADVANTAGES OF UIMU-HG1700

The HG1700 IMU is available in a range of gyro performance levels from one to five degrees per hour. Honeywell's high production volume of HG1700 IMUs enables excellent tactical grade performance for an economical price with short delivery times. The UIMU-HG1700 is available as a complete assembly including the IMU and environmentally sealed enclosure. For customers who already have the HG1700 IMU, the enclosure can be purchased separately and the IMU easily integrated.

## IMPROVE SPAN UIMU-HG1700 ACCURACY

Take advantage of NovAtel CORRECT<sup>®</sup> to receive your choice of accuracy and performance, from decimetre to RTK-level positioning. For more demanding applications, Inertial Explorer<sup>®</sup> post-processing software from our Waypoint<sup>®</sup> Product Group can be used to post-process SPAN UIMU-HG1700 data and offers the highest level of accuracy with the system.

## BENEFITS

- + Economical tactical grade IMU
- + Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- + Short product delivery time

## FEATURES

- + Ring-laser gyro technology
- + 100 Hz data rate
- + 12-28 VDC power input
- + SPAN INS functionality

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

# UIMU-HG1700



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

### Horizontal Position Accuracy (RMS)

Single point L1/L2	1.2 m
SBAS <sup>2</sup>	60 cm
DGPS	40 cm
TerraStar-L <sup>3,4</sup>	40 cm
TerraStar-C <sup>3,4</sup>	4 cm
TerraStar-C PRO <sup>3,4</sup>	2.5 cm
RTK	1 cm + 1 ppm

### Data Rate

IMU measurements	100 Hz
INS position	100 Hz
INS velocity	100 Hz
INS attitude	100 Hz

**Time Accuracy<sup>5</sup>** 20 ns RMS

**Max Velocity<sup>6</sup>** 515 m/s

## IMU PERFORMANCE<sup>7</sup>

### UIMU-HG1700-AG62

Gyro input range	±1000 deg/sec
Gyro rate bias	5.0 deg/hr
Gyro rate scale factor	150 ppm
Angular random walk	0.5 deg/√hr
Accelerometer range <sup>8</sup>	±50 g
Accelerometer linearity	500 ppm
Accelerometer scale factor	300 ppm
Accelerometer bias	2.0 mg

### UIMU-HG1700-AG58

Gyro input range	±1000 deg/sec
Gyro rate bias	1.0 deg/hr
Gyro rate scale factor	150 ppm
Angular random walk	0.125 deg/√hr
Accelerometer range <sup>8</sup>	±50 g
Accelerometer linearity	500 ppm
Accelerometer scale factor	300 ppm
Accelerometer bias	1.0 mg

## PHYSICAL AND ELECTRICAL

### Dimensions

168 x 195 x 146 mm

### Weight

4.5 kg

### Power

Power consumption

8 W (typical)

Input voltage

+12 to +28 V

### Connector

MIL-C-38999-III, 22 pin

## ENVIRONMENTAL

### Temperature

Operating -30°C to +60°C

Storage -45°C to +80°C

**Humidity** 95% non-condensing

**MTBF** 2,000 hrs

**Waterproof** IEC 60259 IPX7

**Dust** IEC 60259 IP6X

## OPTIONAL ACCESSORIES

- Inertial Explorer post-processing software

For the most recent details of this product:

[www.novatel.com/products/span-gnss-inertial-systems/span-imus/uimu-h58/](http://www.novatel.com/products/span-gnss-inertial-systems/span-imus/uimu-h58/)

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**Version 13** Specifications subject to change without notice.

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## PERFORMANCE DURING GNSS OUTAGES<sup>1,9</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	0.05	0.020	0.010	0.010	0.010	0.021
	SP	1.20	0.60	0.020	0.010	0.010	0.010	0.023
	PP <sup>11</sup>	0.01	0.02	0.020	0.010	0.005	0.005	0.008
10 s	RTK <sup>10</sup>	0.09	0.05	0.023	0.010	0.014	0.014	0.026
	SP	1.72	1.59	0.030	0.012	0.015	0.015	0.028
	PP <sup>11</sup>	0.01	0.02	0.020	0.010	0.005	0.005	0.008
60 s	RTK <sup>10</sup>	2.45	0.28	0.096	0.013	0.016	0.016	0.035
	SP	3.49	1.68	0.105	0.014	0.017	0.017	0.040
	PP <sup>11</sup>	0.12	0.02	0.021	0.010	0.006	0.006	0.011

<sup>1</sup> Typical values (open sky conditions). Performance specifications subject to GNSS system characteristics, Signal-in-Space (SIS) operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources.

<sup>2</sup> GPS-only.

<sup>3</sup> Requires subscription to TerraStar data service. Subscriptions available from NovAtel.

<sup>4</sup> TerraStar service available depends on the SPAN receiver used. See the receiver product sheet for details.

<sup>5</sup> Time accuracy does not include biases due to RF or antenna delay.

<sup>6</sup> Export licensing restricts operation to a maximum of 515 metres/second.

<sup>7</sup> Supplied by IMU manufacturer.

<sup>8</sup> GNSS receiver sustains tracking up to 4 g.

<sup>9</sup> Table contains values for the UIMU-HG1700-AG58.

For the UIMU-HG2 Performance During GNSS Outages Table, please visit [novatel.com/assets/Documents/Papers/IMU-HG62table.pdf](http://novatel.com/assets/Documents/Papers/IMU-HG62table.pdf).

<sup>10</sup> 1 ppm should be added to all values to account for additional error due to baseline length.

<sup>11</sup> Post-processing results using Inertial Explorer software.