



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

### Benefits

Economical tactical-grade IMU

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

High production volume resulting  
in fast delivery

### Features

Ring-laser gyro technology

100 Hz data rate

9-28 V power input

### 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-HG Overview

The IMU-HG contains the Honeywell HG1700 inertial measurement unit. The HG1700 is a tactical-grade IMU containing ring laser gyros and servo accelerometers. The IMU-HG handles the power requirements of the IMU from a 9-28 V power input and provides the IMU data to a SPAN-enabled GNSS/INS receiver such as the Propak® or SPAN-SE 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 ITAR controlled and requires export approval for customers outside the United States.

### Advantages of IMU-HG

The HG1700 IMU is available in a range of gyro performance levels from one to 10 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 IMU-HG 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 inside.

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> (RMS)**

	IMU-HG62	IMU-HG58
Pitch	0.018°	0.013°
Roll	0.018°	0.013°
Azimuth	0.053°	0.031°

**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	100 Hz
INS Position	100 Hz
INS Velocity	100 Hz
INS Attitude	100 Hz

**IMU Performance****IMU-H62**

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>6</sup>	±50 g
Accelerometer Linearity	500 ppm
Accelerometer Scale Factor	300 ppm
Accelerometer Bias	2.0 mg

**IMU-H58**

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>6</sup>	±50 g
Accelerometer Linearity	500 ppm
Accelerometer Scale Factor	300 ppm
Accelerometer Bias	1.0 mg

**IMU Physical and Electrical****Dimensions      193 x 167 x 100 mm****Weight                      3.4 kg****Power**

Power Consumption	8 W (typical)
Input Voltage	+12 to 28 V

**Input/Output Connectors**

Power	MIL-C-38999-III, 3 pin
Communication	MIL-C-38999-III, 13 pin

**Environmental**

Temperature	
Operating	-30°C to +60°C
Storage	-45°C to +80°C
Humidity	95% non-condensing

**MTBF****2,000 hrs****Performance During GNSS Outages (IMU-H58)<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	0.09	0.02	0.012	0.002	0.004	0.004	0.006
	DGPS	0.31	0.25	0.020	0.006	0.005	0.006	0.016
	SP	1.24	1.48	0.022	0.006	0.006	0.006	0.018
30 s	RTK	0.61	0.10	0.040	0.005	0.005	0.006	0.012
	DGPS	0.85	0.32	0.047	0.007	0.007	0.008	0.019
	SP	1.51	1.50	0.050	0.008	0.008	0.008	0.020
60 s	RTK	2.45	0.28	0.094	0.008	0.009	0.010	0.017
	DGPS	2.87	0.49	0.100	0.009	0.009	0.010	0.022
	SP	3.28	1.57	0.103	0.010	0.009	0.011	0.023

For IMU-H62 Performance During GNSS Outages Table, please visit [novatel.com/Documents/Papers/IMU-HGG2table.pdf](http://novatel.com/Documents/Papers/IMU-HGG2table.pdf)

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For the most recent details of this product:  
[novatel.com/Documents/Papers/IMU-HG.pdf](http://novatel.com/Documents/Papers/IMU-HG.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 (100 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.

