

OEM-HG1900

Tactical grade MEMS IMU combines with SPAN GNSS+INS technology from Hexagon | NovAtel providing 3D position, velocity and attitude



World-leading GNSS+INS technology

SPAN GNSS+INS technology brings together two different but complementary technologies: Global Navigation Satellite System (GNSS) positioning and Inertial Navigation Systems (INS). The absolute accuracy of GNSS positioning and the stability of Inertial Measurement Unit (IMU) measurements combine to provide an exceptional 3D navigation and attitude solution that is stable and continuously available, even through periods when satellite signals are blocked.

Sophisticated, tactical grade performance

The HG1900 IMU offers a hybrid package of Honeywell's Micro Electromechanical Systems (MEMS) Gyros and RBA accelerometers. Economical, robust and small, the low power HG1900 provides high end tactical grade performance for commercial and military guidance and navigation applications. When integrated with SPAN GNSS+INS technology, this IMU is ideal for airborne and ground applications that require accurate 3D position, velocity and attitude data. The HG1900 is a commercial product that can be licensed under the jurisdiction of the U.S. Department of Commerce for customers outside the United States.

Combining SPAN and MEMS technology

A proprietary NovAtel Universal IMU Controller (UIC) couples the HG1900 with SPAN enabled receivers, offering a unique, powerful GNSS+INS system for weight and size constrained applications.

Require higher accuracy?

Receivers from NovAtel provide your choice of accuracy and performance, from decimetre to RTK-level positioning. For the most demanding applications, Waypoint Inertial Explorer post-processing software offers the highest level of accuracy

Benefits

- High performance IMU
- Optimal for aerial, hydrographic survey and Industrial applications
- High sensor dynamic range

Features

- MEMS gyros and RBA accelerometers
- Stationary INS alignment capable
- IMU Data rate: 100Hz
- SPAN GNSS+INS capability with configurable application profiles

IMU-HG1900-CA50



SPAN System Performance¹

Horizontal Position Accuracy (RMS)

Single point L1/L2	1.2 m
SBAS ²	60 cm
DGPS	40 cm
TerraStar-L ^{3,4}	40 cm
TerraStar-C PRO ^{3,4}	2.5 cm
TerraStar-X ^{3,4}	2 cm
RTK	1 cm +1 ppm

Data Rate

IMU Raw Data Rate	100 Hz
INS Solution	Up to 200 Hz

Time Accuracy⁵ 20 ns RMS

Max Velocity⁶ 515 m/s

IMU Performance⁷

Gyroscope Performance

Input range	±1000 deg/sec
Rate bias	5 deg/hr
In-run bias stability	1 deg/hr
Scale factor linearity	150 ppm
Angular random walk	0.09 deg/√hr

Accelerometer Performance

Range	±30 g
Linearity	500 ppm
Scale factor linearity	500 ppm
Scale factor repeatability	300 ppm
Bias repeatability	1 mg
Bias in-run stability	0.7 mg

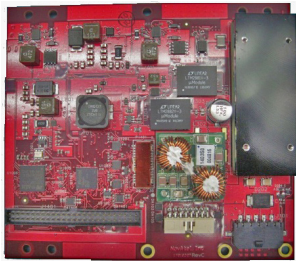
PHYSICAL AND ELECTRICAL

IMU dimensions 92.7 mm dia max × 79.1 mm h

IMU weight <460 g

Power consumption <3 W

UIC Specifications:



Physical and Electrical

Dimensions 113 × 100 × 17.5 mm

Weight 125 g

Power

Input voltage	10 VDC – 34 VDC
Power consumption	4 W

Communication Ports

- 1 RS-422 COM port for the NovAtel GNSS receiver
- 1 RS-422 port for the IMU
- 1 Wheel sensor input

Connectors

- 5-pin power connector
- 16-pin receiver communication connector
- 50-pin IMU connector

Environmental

Temperature

Operating	-40°C to +75°C
Storage	-55°C to +90°C

Vibration

Random	MIL-STD 810G (Cat 24, 7.7 g RMS)
Sine	IEC 60068-2-6

Bump IEC 68-2-29 (25 g)

Shock MIL-STD-810G (40 g)

Performance During GNSS Outages⁸

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 ⁹	0.02	0.03	0.010	0.010	0.010	0.010	0.030
	PPP	0.06	0.15					
	SP	1.00	0.60					
	Post-Processed ¹⁰	0.01	0.02					
10 s	RTK ⁹	0.12	0.08	0.020	0.012	0.013	0.013	0.036
	PPP	0.16	0.20					
	SP	1.10	0.65					
	Post-Processed ¹⁰	0.01	0.02					
60 s	RTK ⁹	1.92	0.33	0.080	0.016	0.018	0.018	0.050
	PPP	1.96	0.45					
	SP	2.90	0.90					
	Post-Processed ¹⁰	0.10	0.13					

1 Typical values. 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. 2 GPS-only. 3 Requires subscription to TerraStar data service. Subscriptions available from NovAtel. 4 TerraStar service available depends on the SPAN enabled receiver used. See the receiver product sheet for details. 5 Time accuracy does not include biases due to RF or antenna delay. 6 Export licensing restricts operation to a maximum of 515 metres/second. 7 Supplied by IMU manufacturer. 8. Outage statistics were calculated by taking the RMS of the maximum errors over a minimum of 30 complete GNSS outages. Each outage was followed by 120 seconds of full GNSS availability before the next outage was applied. High accuracy GPS updates (fixed ambiguities) were available immediately before and after each outage. 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). 9. 1ppm should be added to all values to account for additional error due to baseline length. 10. Post-processing results using Inertial Explorer software.

Contact Hexagon | NovAtel

sales.nov.ap@hexagon.com 1-800-NOVATEL (U.S. and Canada) or 403-295-4900 | China: 0086-21-68882300 | Europe: 44-1993-848-736 | SE Asia and Australia: 61-400-883-601. For the most recent details of this product: novatel.com

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