

IMU-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 MEMS performance

The IMU-HG1900 IMU offers a hybrid package of Honeywell's Micro Electromechanical Systems (MEMS) gyros and RBA accelerometers. Economical, robust and small, the low-power IMU-HG1900 provides high end tactical grade performance for commercial and military guidance and navigation applications. When integrated with SPAN technology, this IMU is ideal for airborne and ground applications that require accurate 3D position, velocity and attitude data. The IMU-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.

The IMU-HG1900 is available as a complete assembly in an environmentally sealed enclosure. The HG1900 is also available as a stand alone OEM product that can be easily paired with a SPAN enabled GNSS receiver.

Improved 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
- Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- Rugged design ideal for challenging environments
- High sensor dynamic range

Features

- MEMS gyros and RBA accelerometers
- Stationary INS alignment capable
- IMU data rate: 100 Hz
- Enclosure comes with optional wheel sensor input
- SPAN GNSS+INS capability with configurable application profiles

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
Scale factor repeatability	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

Dimensions 130 x 130 x 125 mm

Weight 2.5 kg

Power

Power consumption	8 W (typical)
Input voltage	+10 to +34 VDC

Connectors

Power	SAL M12, 5 pin, male
Data	SAL M12, 4 pin, female
Wheel sensor	SAL M12, 8 pin, male

Environmental

Temperature

Operating	-40°C to +55°C
Storage	-40°C to +80°C

Humidity

MIL-STD-810G(Ch1), Method 507.6

Random Vibe

MIL-STD-810G(Ch1), Method 514.7 (2.0g)

Environment

MIL-STD-810G(CH1) Method 512.6 (IEC 60529 IP67)

Compliance

FCC, ISED, CE

Included Accessories

- Power cable
- Communication cable
- Wheel sensor cable

Optional Accessories

- Mounting plate
- Inertial Explorer post-processing software

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. 1 ppm 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

Inertial Explorer, NovAtel, OEM7, SPAN, TerraStar and Waypoint are trademarks of NovAtel, Inc., entities within the Hexagon Autonomy & Positioning division, their affiliated entities, and/or their licensors. All other trademarks are properties of their respective owners.

©2021 NovAtel Inc. All rights reserved. NovAtel is part of Hexagon. NovAtel makes no representation or warranty regarding the accuracy of the information in this publication. This document gives only a general description of the product(s) or service(s) offered by NovAtel, and, except where expressly provided otherwise, shall not form part of any contract. Such information, the products and conditions of supply are subject to change without notice.