

IMU-P1750

P-1750 IMU from KVH with SPAN GNSS+INS technology from Hexagon | NovAtel provides continuous 3D position, velocity and attitude solution



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 System (INS). The absolute accuracy of GNSS positioning with the stability of inertial measurement unit (IMU) gyro and accelerometer measurements generate a 3D navigation solution that is stable and continuously available. Deeply coupling the GNSS and inertial measurements through SPAN technology enables better bridging through GNSS interruptions and rapid reacquisition of signals.

Overview

The P-1750 is designed to be paired with receivers from NovAtel. Commercially exportable, it is comprised of photonic Fiber Optic Gyros (FOG) and Micro Electromechanical Systems (MEMS) accelerometers. FOGs offer exceptionally long life and stable performance compared to similar gyro technologies.

Advantages of P-1750

The P-1750 offers tactical-grade performance in a compact and rugged package with minimal power consumption. Paired with a receiver from NovAtel, the P-1750 offers a fully integrated, deeply coupled GNSS and IMU system that delivers a continuous position, velocity and attitude solution.

Improve P-1750 accuracy

Receivers from NovAtel provide your choice of accuracy and performance, from decimetre to RTK-level positioning. For more demanding applications, Waypoint Inertial Explorer post-processing software can be used to post-process P-1750 data to provide the system's highest level of accuracy.

Benefits

- High performance IMU
- Optimised for aerial, hydrographic survey and industrial applications
- Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- Commercially exportable
- Ideal for a control reference system

Features

- Photonic fiber optic gyros and MEMS accelerometers
- Stationary INS alignment capable
- 200 Hz IMU data rate
- Direct UART interface to OEM7 receivers
- 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	200 Hz
INS Solution	Up to 200 Hz
Time Accuracy⁵	
	20 ns RMS
Max Velocity⁶	
	515 m/s

IMU Performance⁷

Gyroscope Performance	
Input rate	±490°/s
Bias instability	0.05°/hr
Angular random walk	0.012°/√hr
Scale factor non-linearity	≤50 ppm
Accelerometer Performance	
Input range	10 g
Bias instability	15 µg
Velocity random walk	34 µg/√Hz
Physical and Electrical	
Dimensions	88.9 x 73.7 mm
Weight	0.7 kg
Power	
Power consumption	8 W max
Input voltage	+9 to +36 VDC
Input/Output Connectors	
Power and I/O	15-pin Micro-D

Environmental

Temperature	
Operating	-40°C to +75°C
Storage	-50°C to +85°C
Vibration	
Operational	8 g RMS (20 - 2000 Hz random)
Non-operational	12.5 g RMS (20 - 2000 Hz random)
Shock	
Operational	9 g (11 ms sawtooth)
Non-operational	40 g (11 ms sawtooth)
Included Accessories	
• Combined I/O and power cable	
Optional Accessories	
• Inertial Explorer post-processing software	

Performance During GNSS Outages^{1,8}

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	0.015	0.015	0.040
	PPP	0.06	0.15					
	SP	1.00	0.60					
	Post-Processed ¹⁰	0.01	0.02					
10 s	RTK ⁹	0.17	0.13	0.030	0.025	0.020	0.020	0.050
	PPP	0.21	0.25					
	SP	1.15	0.70					
	Post-Processed ¹⁰	0.02	0.02					
60 s	RTK ⁹	3.32	1.73	0.160	0.070	0.030	0.030	0.060
	PPP	3.36	1.85					
	SP	4.30	2.30					
	Post-Processed ¹⁰	0.16	0.09					

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 a 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. RMS, incremental error growth from steady-state accuracy. Computed with respect to full GPS, RTK trajectory. 9. 1 ppm should be added to all values to account for additional error due to baseline length. 10. Post-processing accuracy using Inertial Explorer processing 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.

©2022 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.