SPAN® IMU-KVH1750

IMU-KVH1750 WITH NOVATEL'S GNSS TECHNOLOGY PROVIDES CONTINUOUS 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.

IMU-KVH1750 OVERVIEW

The IMU-KVH1750 is designed to be paired with NovAtel's OEM6® line of receivers. Commercially exportable, it is comprised of 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 IMU-KVH1750

The IMU-KVH1750 offers tactical grade performance in a compact and rugged package with minimal power consumption. Paired with NovAtel's OEM6 receiver, the IMU-KVH1750 offers a fully integrated, tightly coupled GNSS and IMU system that delivers a continuous position, velocity and attitude solution.

IMPROVE IMU-KVH1750 ACCURACY

Take advantage of NovAtel CORRECT™ to receive your choice of accuracy and performance, from decimetre to RTK-level positioning. For more demanding applications, Inertial Explorer® post-processing software from our Waypoint® Products Group can be used to post-process IMU-KVH1750 data to provide the system's highest level of accuracy.

BENEFITS

+ Continuous, stable positioning
+ Withstands harsh environments
+ Easy integration with NovAtel's OEM6 series GNSS+INS receivers
+ Commercially exportable IMU

FEATURES

+ Fiber optic gyros and MEMS accelerometers
+ SPAN INS functionality

If you require more information about our SPAN products, visit www.novatel.com/span

IMU-KVH1750

SPAN SYSTEM PERFORMANCE[1]

Horizontal Position Accuracy (RMS)

Single point L1/L2	1.2 m
NovAtel CORRECT™	
» SBAS[2]	60 cm
» DGPS	40 cm
» PPP[3, 4]	4 cm
» RTK	1 cm + 1 ppm

Data Rate

IMU measurement	200 Hz
INS solution	Up to 200 Hz

Time Accuracy[5]	20 ns RMS
Max Velocity[6]	515 m/s

IMU PERFORMANCE[7]

Gyroscope Performance

Technology	FOG
Input rate (max)	±490°/s
Bias stability	0.05°/hr
Bias temperature stability	0.7°/hr
Bias offset	±2°/hr
Scale factor	≤50 ppm
Scale factor non-linearity	≤50 ppm
Scale factor temperature sensitivity	≤200 ppm
Angular random walk	0.012°/√hr
Input axis misalignment	±0.4 mrad

Accelerometer Performance

Range	±10 g
Bias stability	7.5 mg
Bias temperature stability	≤1 mg
Bias offset	±2 mg
Scale factor non-linearity	<0.9% of full scale
Scale factor temperature sensitivity	≤100 ppm/°C
Velocity random walk	0.23 ft/sec/√hr
Input axis misalignment	±1.0 mrad

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

Humidity	95% non-condensing

Vibration

Operational	8 g RMS
Non-operational	12 g RMS

Shock

Operational	9 g
Non-operational	40 g

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	0.02	0.01	0.015	0.015	0.035
	SP	1.00	0.60	0.02	0.01	0.015	0.015	0.035
	PP[10]	0.01	0.02	0.02	0.01	0.005	0.005	0.017
10 s	RTK[9]	0.13	0.12	0.04	0.03	0.020	0.020	0.045
	SP	1.15	0.70	0.04	0.03	0.020	0.020	0.045
	PP[10]	0.01	0.02	0.02	0.01	0.005	0.005	0.017
60 s	RTK[9]	3.30	1.70	0.15	0.07	0.030	0.030	0.055
	SP	4.30	2.30	0.15	0.07	0.030	0.030	0.055
	PP[10]	0.15	0.11	0.02	0.01	0.007	0.007	0.019

1. Typical SPAN system performance values when using this IMU. 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.
2. GPS-only.
3. Requires subscription to TerraStar data service. Subscriptions available from NovAtel.
4. An OEM628, OEM638, FlexPak6 or ProPak6 receiver is required.
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.

For the most recent details of this product:
www.novatel.com/products/span-gnss-inertial-systems/span-imus/imu-kvh1750/

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Europe 44-1993-848-736

SE Asia and Australia 61-400-883-601

Version 5 Specifications subject to change without notice.

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