

# 1750 IMU

## Fiber Optic Gyro Inertial Measurement Unit



### Key Features

- 3 high-precision KVH FOGs provide excellent reliability and stable performance
- 3 MEMS accelerometers
- Highly accurate 6-degrees-of-freedom angular rate and acceleration data
- Affordable commercial off-the-shelf (COTS) system
- Flexible interfaces and compact design
- Excellent shock, vibration, and thermal performance
- Available with 2 g, 10 g, or 30 g accelerometers

### Applications

- Antenna, camera, laser pointing, and stabilization
- GNSS-aiding
- Autonomous vehicles
- AHRS
- EO/FLIR stabilization
- Flight controls
- Mapping/surveying
- Oil and gas exploration
- Navigation, guidance, and positioning
- Motion-sensing

### The Next Generation Navigation and Stabilization System

The KVH 1750 IMU is the flagship of KVH's miniaturized advanced navigation and stabilization system sensor products. The KVH 1750 IMU leverages the technology of the highly successful KVH DSP-1750 fiber optic gyro (FOG), the world's smallest high performance FOG integrated with very low noise MEMS accelerometers. The resulting small size and high performance of the 1750 IMU make it perfect for unmanned and autonomous systems or any application where size, weight, and power dissipation must be minimized; it offers the ideal combination of price and performance.

### Top Performance in Challenging Conditions

Utilizing breakthrough proprietary algorithms, KVH designed the 1750 IMU to perform with extreme stability in the most demanding environments, including thermal ambient conditions, with outstanding shock and vibration performance. The high reliability of KVH FOG technology is a core feature that assures sustained IMU operation and mission success.

### Compact and Innovative Package

The KVH 1750 IMU offers ease of use and high adaptability, featuring flexible RS-422 asynchronous communication with user programmable data output rates from 1 to 1000 Hz. The package dimensions and mounting features enable easy drop-in replacement.

### Maximum Flexibility for End User

As the ability to tailor the output to exactly what the end user requires is key, KVH provides the user the opportunity to create the desired message output from both the 1750 IMU's fiber optic gyros and integrated accelerometers. In addition, the 1750 IMU offers users a high degree of flexibility, as the baud and data rates can be adjusted. This enables the user to minimize the communication latency, delivering accurate information even faster.

### Highly Compatible for Retrofits or New Designs

With breakthrough performance, size, and flexibility in one package, the KVH 1750 IMU is easily integrated into retrofits or new designs. Most importantly, the KVH technology behind the 1750 IMU is proven and reliable, resulting in an IMU that is ideal for providing accurate data in challenging environments.



*KVH inertial sensors and gyros are key to stabilization and positioning systems for such platforms as high-speed gimbals, antennas, laser pointing, high-definition cameras, and other optical and sensor systems requiring high-performance motion-sensing and control.*

# KVH 1750 IMU

## Performance Specifications

<b>Input Rate (max)</b>	±490°/sec
<b>Bias Instability (25°C)</b>	≤0.1°/hr, 1σ (max), ≤0.05°/hr, 1σ (typical)
<b>Bias vs. Temp. (≤1°C/min)</b>	≤1°/hr, 1σ (max), ≤0.7°/hr, 1σ (typical)
<b>Bias Offset (25°C)</b>	±2°/hr
<b>Scale Factor Non-linearity (max rate, 25°C)</b>	≤50 ppm, 1σ
<b>Scale Factor vs. Temperature (≤1°C/min)</b>	≤200 ppm, 1σ
<b>Angle Random Walk (25°C)</b>	≤0.012°/√hr (≤0.7°/hr/√Hz)
<b>Bandwidth (-3 dB)</b>	≥440 Hz

## Electrical/Mechanical

<b>Initialization Time (valid data)</b>	≤1.5 sec
<b>Data Interface</b>	Asynchronous or Synchronous RS-422
<b>Baud Rate</b>	Selectable 9.6 Kbps to 921.6 Kbps
<b>Data Rate</b>	User Selectable 1 to 1000 Hz
<b>Dimensions (max)</b>	88.9 mm Dia x 73.7 mm H (3.5" x 2.9")
<b>Weight (max)</b>	0.7 kg (1.45 lbs)
<b>Power Consumption</b>	8 W (max), 5 W (typical)
<b>Input Voltage</b>	+9 to +36 VDC

## Environment

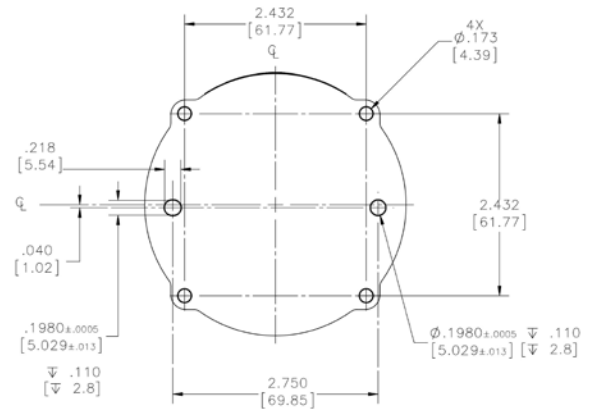
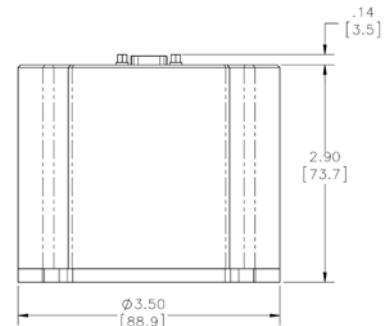
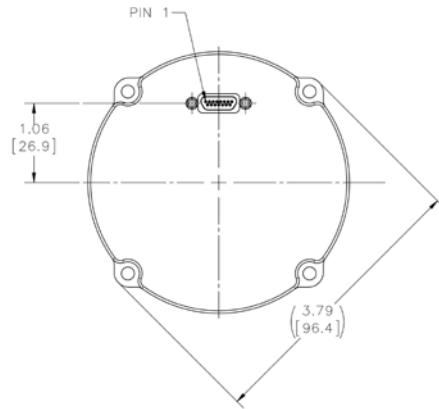
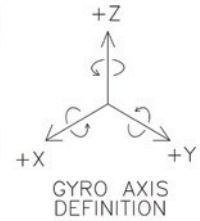
<b>Temperature (operating)</b>	-40°C to +75°C (-40°F to +167°F)
<b>Shock (operating)</b>	9 g, 11 msec, sawtooth
<b>Vibration (operating)</b>	8 g rms, 20-2000 Hz random

## Accelerometers

Input Limit (max)	±2 g	±10 g	±30 g
<b>Bias Instability (constant temp)</b>	0.01 mg-1σ	0.05 mg-1σ	0.15 mg-1σ
<b>Bias Repeatability, 1yr</b>	1.5 mg (min) 5 mg (max)	7.5 mg (min) 25 mg (max)	22 mg (min) 75 mg (max)
<b>Scale Factor Linearity, (25°C)</b>	0.008	0.009	0.009
<b>Scale Factor Temp. Sensitivity</b>	200 ppm/°C		
<b>Velocity Random Walk, (25°C)</b>	0.024 mg/√Hz	0.012 mg/√Hz	0.36 mg/√Hz
<b>Bandwidth (-3 dB)</b>	200 Hz	200 Hz	100 Hz
<b>Data Output (Sampling) Rate</b>	1 to 1000 Hz*		

\*User selectable

For detailed interface control drawings (ICD) and technical manuals on this product, please visit [www.kvh.com/1750IMUdocs](http://www.kvh.com/1750IMUdocs)



Designers of navigation systems for unmanned vehicles of all types rely on high-performance KVH IMUs and gyros to help provide navigation data, stabilization, and relative positioning.

