

# P-1750 IMU

Photonic Inertial Measurement Unit



## Key Features

- All new, exclusive KVH photonic integrated chip (PIC) technology
- Available with either 10g or 30g high-performance 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

## Applications

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

## Versatile, Highly Accurate FOG-based IMU with Photonic Integrated Chip (PIC) Technology for Demanding Autonomous and Manned Applications

The new KVH P-1750 IMU delivers outstanding performance thanks to KVH's breakthrough PIC technology for increased reliability and upgraded high-performance accelerometers for the precision that autonomous platforms demand. The P-1750 is available with a choice of 10g or 30g high-end accelerometers that augment performance for autonomous and manned systems with improved Bias Instability, Scale Factor, and Velocity Random Walk.

## PIC Technology for Superior Performance

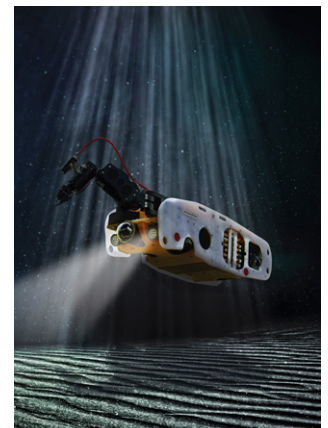


KVH's new photonic chip technology reinvents fiber optic gyro (FOG) technology with improved reliability, unit-to-unit repeatability, and easier integration with an integrated planar optical chip that replaces individual fiber optic components. The result is a precision photonic fiber optic gyro sensor that is more durable and reliable with increased performance designed for a high level of repeatability.

## Maximum Flexibility for Challenging Platforms

The KVH P-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.

As the ability to tailor the output to exactly what the end user requires is key, KVH enables users to customize the desired message output from both the P-1750 IMU's photonic FOGs and integrated high-performance accelerometers. In addition, the P-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.



## KVH P-1750 IMU

### Performance Specifications – Gyros

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

### Performance Specifications – Accelerometers

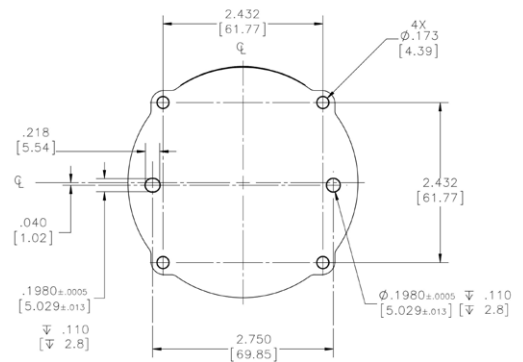
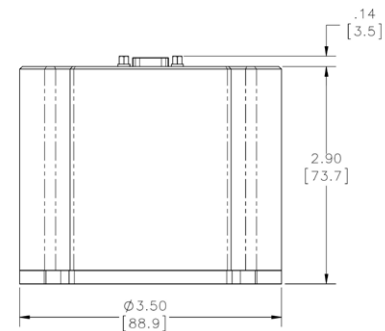
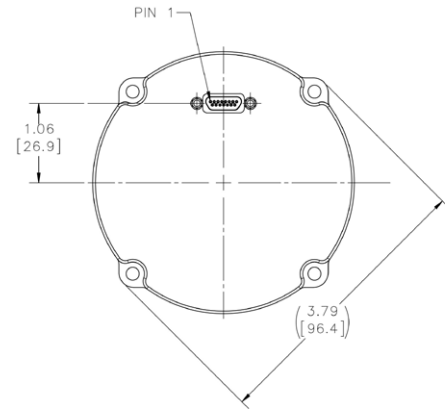
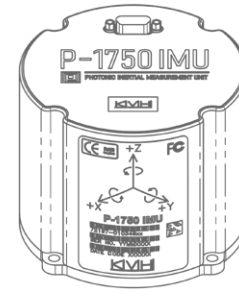
	10g	30g
<b>Input Range</b>	±10g (max)	±30g (max)
<b>Bias Instability (25°C)</b>	15 μg, 1σ	45 μg, 1σ
<b>Bias Offset (25°C)</b>	±110 μg, 1σ	±325 μg, 1σ
<b>Bias Temperature Sensitivity*</b>	≤375 μg, 1σ	≤1125 μg, 1σ
<b>Scale Factor Temperature Sensitivity*</b>	≤120 ppm/°C (typical)	≤120 ppm/°C (typical)
<b>Velocity Random Walk (25°C)</b>	34 μg/√Hz	102 μg/√Hz
<b>Bandwidth (-3 dB)</b>	≥200 Hz	≥200 Hz

### Environment

	10g	30g
<b>Temperature (operating)</b>	-40°C to +75°C (-40°F to +167°F)	-40°C to +75°C (-40°F to +167°F)
<b>Shock (operating)</b>	9g (11 ms, sawtooth)	28g (11 ms, sawtooth)
<b>Vibration (operating)</b>	8g rms (20-2000 Hz, random)	12g rms (20-2000 Hz, random)

### Electrical/Mechanical

<b>Initialization Time (25°C)</b>	≤3 sec
<b>Data Interface</b>	RS-422 Full Differential, Asynchronous or Synchronous
<b>Baud Rate</b>	9.6 Kbps to 921.6 Kbps, User-selectable
<b>Data Rate</b>	1 to 1000 Hz; User-selectable
<b>Dimensions</b>	88.9 mm Dia x 73.7 mm H (3.5" x 2.9")
<b>Weight</b>	0.7 kg (1.54 lbs)
<b>Power Consumption</b>	5 W (typical), 8 W (max)
<b>Input Voltage</b>	+9 to +36 VDC



For technical manuals on this product,  
please visit [kvh.com/P1750docs](http://kvh.com/P1750docs)

\* ≤1°C/min ramp rate

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