1775 IMU

Fiber Optic Gyro Inertial Measurement Unit

Key Features

- Highest performing IMU from KVH
- Available with 25g accels for highly dynamic applications
- Extremely high bandwidth (≥1000 Hz)
- User-programmable update rates from 1 to 5000 Hz
- ≤500 µs Total Motion-to-Output Latency
- User-configurable baud rate from 9.6 kbps to 4.1 Mbps
- Asynchronous RS-422 protocol
- Three magnetometers for magnetic field compensation of gyro bias
- Compact and lightweight (0.7 kg (1.5 lbs))

Applications

- Pipeline inspection and maintenance
- Drilling and mining systems
- High-speed gimbal stabilization systems
- Stabilization systems for LIDAR, EO/FLIR
- GNSS-aiding inertial navigation systems
- Manned and unmanned platform stabilization and navigation systems
- Augmented reality and mobile mapping systems
- Guidance and control systems
- Precision pointing and positioning systems

Robust, Precise, FOG-based IMU Provides Premium Performance for the Most Demanding Environments and Applications

Now with either 10g or 25g accelerometers

The 1775 IMU is the premier commercial-off-the-shelf (COTS) inertial measurement unit offered by KVH. Designed to deliver the highest level of performance in KVH's IMU product family, the 1775 IMU is available with either ±10g or ±25g accelerometers. The 1775 IMU with 25g accelerometers is ideal for highly dynamic applications and/or in applications with high levels of acceleration, vibration or shock.

The 1775 IMU is an advanced inertial sensor system that meets the demands of systems requiring very high performance in the most challenging environments. The 1775 IMU leverages the proven technology of the DSP-1760 fiber optic gyro (FOG), the world's smallest high performance FOG. These FOGs are then integrated with either three very low noise 10g or 25g accelerometers, as well as a 3-axis magnetometer for automatic gyro bias compensation even in environments with strong magnetic fields. Both variants of the high-performance 1775 IMU are designed for systems and applications where very high bandwidth, as well as low latency, low noise and low drift are critical parameters for success.

Compact Design for Ease of Integration

All KVH high-performance IMUs offer the same robust, compact package designed for drop-in replacement for many available IMUs. The flexible interface and programmable message outputs simplify the integration of the 1775 IMU. The 1775 IMU offers ease of integration for designers of higher-level inertial navigation, guidance, or stabilization systems by offering user-programmable features including an adjustable baud rate so that communication latency can be adjusted to receive accurate, timely data. Ideal applications for the 1775 IMU include those with challenging environments such as drilling, mining, pipeline inspection and maintenance, mobile mapping systems, and stabilization systems for radar, LIDAR, and high-speed gimbals.

With its three-axis magnetometer, the 1775 IMU is the ideal choice for applications designed for environments requiring magnetic field compensation.

The Inertial Solution for Demanding Environments

The 1775 IMU features an RS-422 asynchronous interface with user-programmable update rates from 1 to 5000 Hz. The robust design of the 1775 IMU ensures reliable and highly-accurate performance, while KVH's proven fiber optic technology and solid state design provide long life and dependable, consistent operation. The 1775 IMU is KVH's premier inertial measurement unit developed specifically to meet the needs of the most challenging applications and operating environments.

KVH 1775 IMU

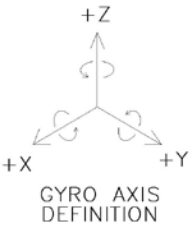
Performance Specifications	
Input Rate *(max)*	±490°/sec
Bias Instability *(25°C)*	≤0.05°/hr, 1σ (typical) ≤0.1°/hr, 1σ (max)
Bias vs. Temp. *(≤1°C/min)*	≤0.7°/hr, 1σ (typical) ≤1°/hr, 1σ (max)
Bias Offset *(25°C)*	±0.5°/hr
Scale Factor Non-linearity *(full rate, 25°C)*	≤50 ppm, 1σ
Scale Factor vs. Temperature *(≤1°C/min)*	≤100 ppm, 1σ
Angle Random Walk *(25°C)*	≤0.012°/√hr (≤0.7°/hr/√Hz)
Bandwidth *(-3 dB)*	≥1000 Hz

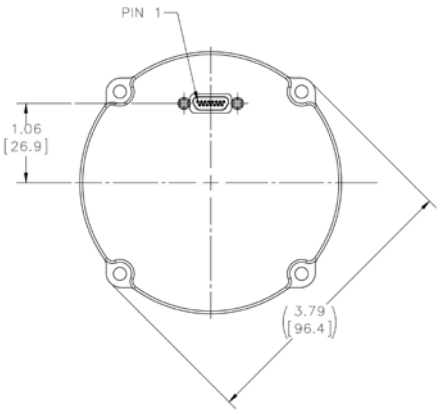
Performance Specifications - Accelerometers		
	10g	**25g**
Input Limit *(max)*	±10g	±25g
Bias Instability *(constant temp)*	≤0.05 mg, 1σ	≤0.05 mg, 1σ
Bias Offset	±0.5 mg	±0.25 mg
Bias Temp Sensitivity	0.5 mg, 1σ (typical) 1.0 mg, 1σ (max)	0.42 mg, 1σ (typical) 1.25 mg, 1σ (max)
Scale Factor vs. Temperature Sensitivity *(full scale, full temp)*	≤500 ppm/°C, 1σ max	≤500 ppm/°C, 1σ max
Velocity Random Walk *(25°C)*	≤0.12mg/√Hz, (0.23ft/sec/√hr)	≤0.12mg/√Hz, (0.23ft/sec/√hr)
Bandwidth *(-3 dB)*	200 Hz	450 Hz

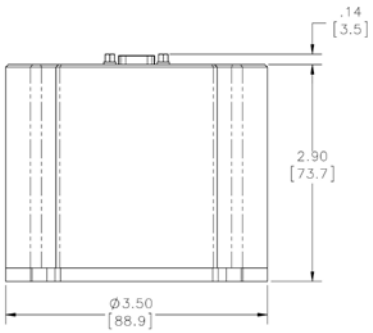
Magnetometers		
	10g	**25g**
Input Range	±10 Gauss	±10 Gauss
Bias	<0.2 Gauss	<0.2 Gauss
Bias Noise *(rms)*	<2 mGauss	<2 mGauss

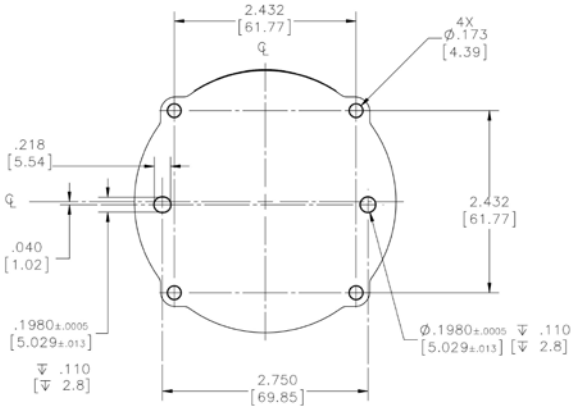
Environment		
	10g	**25g**
Temperature *(operating)*	-40°C to +75°C (-40°F to +167°F)	-40°C to +75°C (-40°F to +167°F)
Shock *(operating)*	9g 11 ms, sawtooth	25g 11 ms, sawtooth
Vibration *(operating)*	8g rms 20-2000 Hz random	15g rms 20-2000 Hz random

Electrical/Mechanical	
Initialization Time *(valid data)*	≤1.5 sec
Data Interface	RS-422, Full Differential Asynchronous or Synchronous
Baud Rate	Selectable 9.6 Kbps to 4147 Kbps
Data Rate	User Selectable 1 to 5000 Hz
Dimensions *(max)*	88.9 mm Dia x 73.7 mm H (3.5" x 2.9")
Weight *(max)*	0.7 kg (1.5 lbs)
Power Consumption	5 W (typical), 8 W (max)
Input Voltage	+9 to +36 VDC









For detailed interface control drawings (ICD) and technical manuals on this product, please visit ***www.kvh.com/1775IMUdocs***

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