

DSP-4000 FOG

High-performance, Dual-axis Fiber Optic Gyro



Key Features

- **Fiber Optic Technology** – Patented DSP technology offers long life, stable operation, and insensitivity to vibration from rotation or acceleration in other axes.
- **Analog or Digital Output** – Choice of analog or RS-422 output that can be deployed across a multitude of applications, both military and commercial.
- **Compact Assembly** – Features military grade connectors and a rugged enclosure design to withstand harsh environments, including the shock associated with weapons firing. Weather-resistant gasket provides the sealing required for salt water exposure.
- **Reduced Life Cycle Cost** – Easily integrates into existing mechanical gyro applications with significantly longer life and lower life cycle cost, with MTBF in excess of 55,000 hours.

Applications

- Gun and Turret Stabilization
- Antenna/Optical/Camera Stabilization
- Positioning and Stabilized Pointing

KVH DSP-4000 Series – The Low-cost, High-performance Alternative to Mechanical Gyros

The DSP-4000 series provides precision accuracy within harsh environments for both military and commercial applications. It is designed for maximum reliability and performance with minimal investment. KVH fiber optic gyro (FOG) technology delivers superior stabilization and tracking capabilities for turret, antenna, and optical stabilization systems. The all-fiber design, with no moving parts to wear out or fail, ensures high reliability, superior performance, and exceptional resilience from the effects of vibration, shock and acceleration. The DSP-4000 series also delivers low noise, high bandwidth and outstanding resolution, making it the optimal economical solution for current and future applications.

The rugged DSP-4000 series is designed to meet required rigorous military specifications. However, it is also used in commercial applications where strength, precision, and durability are critical metrics for success. The DSP-4000 series offers customers a scalable solution, enabling deployment of next-generation gun and turret stabilization designs, as well as dynamic pointing capabilities within a minimal form factor. Originally designed for quick and easy replacement in existing platforms where mechanical gyros were once the only option, the DSP-4000 has evolved into a flexible system for stabilization, navigation, and targeting applications.

Building upon the proven success of the KVH DSP-3000 series, the DSP-4000 series delivers superior bias and scale factor performance. The DSP-4000 gyro package is carefully manufactured to measure angular rates with extreme precision and provide an analog or digital output. In addition, it is also insensitive to cross-axis motion and inertia. The high bandwidth of the system makes it particularly suitable for stabilization of optical, radar, or weapon platforms. With no moving parts to maintain or replace, the DSP-4000 series lasts longer, performs better, and yields significant savings over the life of the system. The DSP-4000 is a dual-axis sensor, providing the same performance in both azimuth and elevation.



The DSP-4000 is a critical component in gun/turret stabilization systems worldwide.

Precision, Performance, and Price

The DSP-4000 performance can also be optimized for specific applications on an individual basis. For optimum flexibility, the DSP-4000 offers varied output formats (analog or RS-422) and input rates up to 375°/s. Fabricated from KVH's proprietary E•Core® polarization maintaining fiber, the DSP-4000 delivers

superior precision and reliable performance at a lower cost than other comparable fiber optic and mechanical gyroscopes. Its temperature stability and repeatability make it particularly well-suited for precision stabilization and pointing applications.

| Specifications | KVH DSP-4000 Dual-axis Fiber Optic Gyro | |
|--|---|-------------------------------------|
| | Digital | Analog |
| Input Rate (<i>max</i>) | ±375°/sec | ±100°/sec |
| Bias Instability (25°C) | ≤1°/hr, 1σ | ≤10°/hr, 1σ |
| Bias vs. Temperature (≤1°C/min) | ≤6°/hr, 1σ | ≤60°/hr, 1σ |
| Bias Offset (25°C) | ±20°/hr | ±36°/hr |
| Scale Factor Non-linearity (<i>max rate</i> , 25°C) | ≤1000 ppm, 1σ | ≤3000 ppm, 1σ |
| Scale Factor vs. Temperature (≤1°C/min) | ≤500 ppm, 1σ | ≤1000 ppm, 1σ |
| Angle Random Walk (25°C) | ≤0.067°/√hr (≤4°/hr/√Hz) | ≤0.10°/√hr (≤6°/hr/√Hz) |
| Electrical/Mechanical Interface | Digital | Analog |
| Bandwidth (-3 dB) | 440 Hz | 100 Hz |
| Initialization Time (<i>valid data</i>) | ≤5 secs | |
| Data Interface | Synchronous, RS-422 | Analog ±10 VDC differential |
| Baud Rate | 115.2 Kbps | Analog ±10 VDC differential |
| Data Rate | 1000 Hz | Analog ±10 VDC differential |
| Physical Specifications | Digital | Analog |
| Dimensions (<i>max</i>) | 162.6 mm L x 144.8 mm W x 83.8 mm H (6.4" x 5.7" x 3.3") | |
| Weight (<i>max</i>) | 2.36 kg (5.2 lbs) | 2.72 kg (6 lbs) |
| Power Consumption | 9 W (max) | |
| Input Voltage | +18 to +32 VDC | |
| Environmental Specifications | Digital | Analog |
| Temperature (<i>operating</i>) | -40°C to +70°C (-40°F to +158°F) | -40°C to +70°C (-40°F to +158°F) |
| Shock (<i>operating</i>) | 55 g, 1 msec, half-sine | 55 g, 1 msec, half-sine |
| Vibration (<i>operating</i>) | 8 g rms, 20-2000 Hz | 8 g rms, 20-2000 Hz |
| MTBF | ≥55,000 hours | |

DS_DSP40006_7.19

For detailed interface control drawings (ICD) and technical manuals on this product, please visit www.kvh.com/DSP4000docs



Made in the U.S.A.

KVH Industries, Inc. • 50 Enterprise Center • Middletown, RI 02842 • U.S.A. • Phone: +1 401 847-3327 • Fax: +1 401 845-2410