

DSP-3000



High-performance, Single Axis Fiber Optic Gyro



Key Features

- Patented Digital Signal Processing
- Exceptional bias stability and linearity
- Excellent reliability
- Choice of analog, digital, or RS-232 output
- Single axis, modular design for multi-axis configurations
- Commercial Off-the-Shelf (COTS) product

Applications

- Antenna/radar/optics stabilisation
- Gun/turret stabilisation
- IMU, GPS/INS integration
- AHRS integration



Many mobile satellite communications antennas rely on the KVH DSP-3000 for accurate pointing and stabilisation.

Superior Performance in a Single Package

The workhorse of KVH's single-axis Fiber Optic Gyro (FOG) series, KVH's original DSP-3000 offers proven performance in a wide range of applications. Its compact and robust design, coupled with a choice of analog, digital, and RS-232 outputs, makes the DSP-3000 the most versatile fiber optic gyro available and an ideal solution for guidance and stabilisation, low-cost inertial measurement units (IMUs), integrated GPS/INS, and AHRS.

The DSP-3000 uses KVH's patented Digital Signal Processing (DSP) electronics. KVH's breakthrough DSP design overcomes the limitations of analog signal processing, virtually eliminating temperature-sensitive drift and rotation errors. In addition, KVH's DSP technology offers significant performance improvements in such critical areas as scale factor and bias stability, scale factor linearity, turn-on to turn-on repeatability, and maximum input rate. Exceptional low noise (ARW), insensitivity to cross-axis error, and shock and vibration robustness make the DSP-3000 a perfect fit for demanding industrial applications. This performance, combined with the inherent simplicity and reliability of our mature all-fiber optical circuit, establish the DSP-3000 as an outstanding and affordable solution for motion sensing, stabilisation, navigation, and precision pointing applications.

Cameras mounted on aircraft require special stabilisation to create clear images or motion pictures, surveillance, and other applications. The KVH DSP-3000 is an essential part of many of these systems.



Precision, Performance, and Price

Fabricated from KVH's proprietary E•Core® polarisation maintaining fiber, the KVH DSP-3000 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 stabilisation, GPS integration, and multi-axis tactical-grade inertial measurement systems. The noise spec-

trum of the DSP-3000 is exceptionally flat, lacking the discrete noise components of mechanical gyros. With no moving parts to maintain or replace, the DSP-3000 lasts longer, functions better, and yields significant product life cycle savings.

Technical Specifications



| Physical Specifications | DSP-3000 | | |
|-------------------------|---|---|---|
| | RS-232 | Serial | Analog |
| Weight on Centerline | 0.27 kg (0.6 lbs) | 0.27 kg (0.6 lbs) | 0.27 kg (0.6 lbs) |
| Size | 88.9 x 58.42 x 33.02 mm (3.5 x 2.3 x 1.3 inches) | 88.9 x 58.42 x 33.02 mm (3.5 x 2.3 x 1.3 inches) | 88.9 x 58.42 x 33.02 mm (3.5 x 2.3 x 1.3 inches) |
| Interface | 100 Hz or 1000 Hz Asynchronous | 1000 Hz Synchronous | ±2 VDC differential 3 dB BW of 200 Hz 45° phase shift at 100 Hz |

| Power and Environmental Specifications | |
|--|-------------------------------------|
| Input Voltage | +5 VDC ±10% |
| Power Consumption | 3 watts (2 watts typical) |
| Operating Temperature | -40°C to +75°C (-40°F to +167°F) |
| Storage Temperature | -50°C to +85°C (-58°F to +185°F) |
| Shock (functional) | 40 g, 6-10 msec, 1/2 sine |
| MTBF | >55,000 hours, Ground Mobile |
| Vibration (operating) | 8g RMS, 20-2000 Hz |
| Sensor Misalignment | ≤ 8 mrad |

| Performance Specifications | DSP-3000 | |
|------------------------------------|--|---------------------------------|
| | Digital | Analog |
| Maximum Input Rate | ±375°/s | ±100°/s |
| Activation Time (valid data) | <5 sec | <5 sec |
| Angle Random Walk ¹ | 0.0667°/√hr (4°/hr/√Hz) | 0.1°/√hr (6°/hr/√Hz) |
| Bandwidth (3 dB) | 44 Hz or 440 Hz | 200 Hz |
| Nominal Scale Factor | N/A | 20 mV/°sec |
| Bias | | |
| Offset (room temp) | ±20°/hr | ±100°/hr |
| Stability (room temp) ¹ | <1°/hr, 1σ | <3°/hr, 1σ |
| Temp. Sensitivity (<1°C/min) | <6°/hr, 1σ | <20°/hr, 1σ |
| Scale Factor | | |
| Linearity (room temp) | <500 ppm, 1σ (for input rates ≤ ±150°/s) | <500 ppm, 1σ (±100°/s input) |
| Linearity (room temp) | <1000 ppm, 1σ (for input rates > ±150°/s) | N/A |
| Error (full temp) | <500 ppm, 1σ | <500 ppm, 1σ |
| Error (full rate & temp) | <1500 ppm, 1σ | <1000 ppm, 1σ |

For detailed interface control drawings (ICD) and technical manuals on this product, please visit www.kvh.com/DSP3000 and click on **Technical Documents**

¹Bias Stability and Angle Random Walk determined by Allan Variance method



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