DSP-3000 Series

High-performance, Single Axis Fiber Optic Gyros

Key Features

- The KVH DSP-3000 series offers three models to suit a wide range of commercial and military applications:
  - **DSP-3000:** standard model, available in multiple digital or analog configurations
  - **DSP-3100:** smallest form factor in the DSP-3000 series
  - **DSP-3400:** features an RS-422, 1000 Hz Synchronous interface
- Patented Digital Signal Processing (DSP) FOG design
- Exceptional bias stability and scale factor linearity– minimal temperature and power-up errors; low noise
- Scale factor accuracy of 500 ppm
- Excellent reliability: >55,000 hours MTBF, Ground Mobile
- Robust for a wide variety of applications including gun/turret stabilization

Applications

- Antenna/Radar/Optics Stabilization
- Gun/Turret Stabilization
- IMU, GPS/INS Integration
- AHRS Integration

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KVH DSP-3000 Series – Offering Precision Stabilization and Control at an Affordable Price

The KVH DSP-3000 series of single axis fiber optic gyros (FOGs) sets a new standard of performance and price. The reduced package size and robust, modular design make low-cost inertial measurement units (IMUs), integrated GPS/INS, and AHRS a reality. The Digital Signal Processing (DSP) electronics offer 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 DSP-3000 series FOGs ideal for demanding industrial and military applications. This performance, combined with the inherent simplicity and reliability of our mature all-fiber optical circuit, establishes the DSP-3000 series as the ideal solution for motion sensing, stabilization, navigation, and precision pointing applications.

The DSP-3000 series is the second generation of gyros that employ KVH's patented DSP technology. KVH's breakthrough DSP design overcomes the limitations of analog signal processing, virtually eliminating temperature-sensitive drift and rotation errors. The DSP-3000 achieves these performance breakthroughs while remaining affordable. It is suitable for applications in which gyros and accelerometers are combined to determine vehicle dynamic motions, as well as any application that requires precise measurement of rate or turning angle.

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

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Physical Specifications	DSP-3000			DSP-3100	DSP-3400
	RS-232	Serial	Analog	RS-422	RS-422
Weight on Centerline	0.6 lbs (0.27 kg)	0.6 lbs (0.27 kg)	0.6 lbs (0.27 kg)	0.44 lbs (0.20 kg)	0.685 lbs (0.313 kg)
Size	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 (88.9 x 58.42 x 33.02 mm)	3.46 x 2.6 x .984 inches (87.88 x 66.04 x 24.99 mm)	3.5 x 2.3 x 1.675 inches (88.9 x 58.42 x 42.54 mm)
Interface	100Hz or 1000Hz Asynchronous	1000Hz Synchronous	±2 VDC differential 3 dB BW of 200Hz 45° phase shift at 100Hz	1000Hz Asynchronous	1000Hz Synchronous

Power and Environmental Specifications All Versions	
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)	Random, 20-2000Hz, 8 g rms
Sensor Misalignment	≤ 8 mrads

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

Performance Specifications	DSP-3000/3100/3400	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°/√h (4°/h/√Hz)	0.1°/√h (6°/h/√Hz)
Bandwidth (3dB)	44Hz or 440Hz	200Hz
Nominal Scale Factor	N/A	20mV/°/sec
Bias		
Offset (room temp)	±20°/h	±100°/h
Stability (room temp)[1]	<1°/h, 1σ	<3°/h, 1σ
Temp. Sensitivity (<1°C/min)	<6°/h, 1σ	<20°/h, 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

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

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