

# DSP-3000 FOG

emcore®

High-performance, Single-axis Fiber Optic Gyro

## IMPROVED SPECIFICATION



### Key Features

- Improved bias vs. temperature and scale factor specifications
- 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 stabilization
- Gun/turret stabilization
- IMU, GPS/INS integration



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

### Superior Performance in a Single Package

The workhorse of EMCORE's single-axis Fiber Optic Gyro (FOG) series, EMCORE's new improved specification 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 stabilization, low-cost inertial measurement units (IMUs), integrated GPS/INS, and AHRS.

The DSP-3000 uses EMCORE's patented Digital Signal Processing (DSP) electronics. EMCORE's breakthrough DSP design overcomes the limitations of analog signal processing, virtually eliminating temperature-sensitive drift and rotation errors. In addition, EMCORE'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, stabilization, navigation, and precision pointing applications.



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

## Precision, Performance, and Price

Fabricated from EMCORE's proprietary E•Core® polarization maintaining fiber, the EMCORE 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 stabilization, GPS integration, and multi-axis

tactical-grade inertial measurement systems. The noise spectrum 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.

Specifications	EMCORE DSP-3000 Single-axis Fiber Optic Gyro	
	Digital	Analog
Input Rate (max)	±375°/sec	±100°/sec
Bias Instability (25°C)	≤1°/hr, 1σ	≤3°/hr, 1σ
Bias vs. Temperature (≤1°C/min)	≤3°/hr, 1σ	≤20°/hr, 1σ
Bias Offset (25°C)	±5°/hr	±100°/hr
Scale Factor Non-linearity (max rate, 25°C)	≤500 ppm, 1σ	
Scale Factor vs. Temperature (≤1°C/min) Taken at +/- 20°/sec	≤250 ppm, 1σ	≤500 ppm, 1σ
Angle Random Walk (25°C)	≤0.067°/√hr (≤4°/hr/√Hz)	≤0.1°/√hr (≤6°/hr/√Hz)
Electrical/Mechanical Interface	Digital	Analog
Bandwidth (-3 dB)	≥440 Hz	200 Hz ±10%
Initialization Time (valid data)	≤5 secs	
Data Interface	Asynchronous RS-232 Optional Synchronous	±2 VDC differential; 3 dB BW of 200 Hz; 45° phase shift at 100 Hz
Baud Rate	115.2 Kbps	2 VDC differential; 3 dB BW of 200 Hz; 45° phase shift at 100 Hz
Data Rate	100 Hz (Asynchronous) 1000 Hz (Synchronous)	±2 VDC differential; 3 dB BW of 200 Hz; 45° phase shift at 100 Hz
Physical Specifications	Digital	Analog
Dimensions (max)	88.9 mm L x 58.4 mm W x 33.0 mm H (3.5" x 2.3" x 1.3")	
Weight (max)	0.27 kg (0.6 lbs)	
Power Consumption	3 W (max), 1.25 W (typical)	
Input Voltage	+5, ±10% VDC	
Environmental Specifications	Digital	Analog
Temperature (operating)	-40°C to +75°C (-40°F to +167°F)	
Shock (operating)	40 g, 10 msec, half-sine	
Vibration (operating)	8 g rms, 20-2000 Hz	
MTBF	≥55,000 hours	

For detailed interface control drawings (ICD) and technical manuals on this product, please visit [emcore.com/nav/support](http://emcore.com/nav/support)

## For More Information

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