emcore®

DATA SHEET

DSP-3100 FOG

High-performance, Single-axis Fiber Optic Gyro

Increased Accuracy in a Smaller Form Factor

Designed for demanding applications requiring high-speed data output, the EMCORE DSP-3100 offers a powerful high-speed RS-422 interface with 1000 Hz asynchronous in a package more compact than the EMCORE DSP-3400. With its industry-standard Samtec 26-pin connector, it offers a versatile package ideal for installations with tighter installation requirements while not sacrificing performance, reliability, or durability.

The entire DSP-3000 series 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 series 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 series as an affordable, outstanding solution for motion sensing, stabilization, navigation, and precision pointing applications.

Precision, Performance, and Price

Fabricated from EMCORE's proprietary E•Core® polarization maintaining fiber, the EMCORE DSP-3100 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-3100 is exceptionally flat, lacking the discrete noise components of mechanical gyros. With no moving parts to maintain or replace, the DSP-3100 lasts longer, functions better, and yields significant product life cycle savings.

APPLICATIONS

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

KEY FEATURES

- **Industry standard 26-pin connector**
- **Single-axis, modular design for multi-axis configurations**
- **Patented Digital Signal Processing (DSP)**
- **Exceptional bias stability and linearity**
- **Industry standard RS-422 communications**
- **Commercial off-the-shelf (COTS) product**

Protected by one or more of the following U.S. and foreign patents: US 8,866,564 US 7,317,847, US 6,763,153, US 6,718,097, US 6,707,558, US 6,429,939, US 6,370,289 B1, US 6,134,356, US 6,041,149, US 5,768,462, US 5,739,944, US 5,552,887. Additional patents pending.

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PERFORMANCE SPECIFICATIONS

SPECIFICATIONS	DIGITAL
Input Rate (max)	±375°/sec
Bias Instability (25°C)	≤1°/hr, 1σ
Bias vs. Temperature (≤1°C/min)	≤6°/hr, 1σ
Bias Offset (25°C)	±20°/hr
Scale Factor Non-linearity (max rate, 25°C)	≤500 ppm, 1σ
Scale Factor vs. Temperature (≤1°C/min) Taken at +/- 20°/sec	≤500 ppm, 1σ
Angle Random Walk (25°C)	≤0.067°/√hr (≤4°/hr/√Hz)
ELECTRICAL/MECHANICAL INTERFACE	**DIGITAL**
Bandwidth (-3 dB)	440 Hz
Initialization Time (valid data)	≤5 secs
Data Interface	Asynchronous RS-422
Baud Rate	375 Kbps
Data Rate	1000 Hz
PHYSICAL	**DIGITAL**
Dimensions (max)	87.9 mm L x 66.0 mm W x 24.9 mm H (3.5" x 2.6" x 1.0")
Weight (max)	0.2 kg (0.44 lbs)
Power Consumption	3 W (max), 1.25 W (typical)
Input Voltage	+5, ±10% VDC
ENVIRONMENTAL	**DIGITAL**
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	>20,000 hours

CONTACT SALES: +1 866.234.4976 | FOGsales@emcore.com | Emcore.com

Emcore LLC
8412 W. 185th Street, Tinley Park, IL 60487
Phone: +1 626.293.3700

2700 Systron Drive, Concord, CA 94518
Phone: +1 925.979.4400

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