

G-2000 Gyroscope Inertial Product Family

The Northrop Grumman G-2000 two-axis gyroscope is the smallest tactical-grade dynamically-tuned gyroscope available. The G-2000 gyro offers proven high performance, small size, excellent reliability and low cost.

The commercial-off-the-shelf G-2000 gyroscope is only subject to Export Administration Regulation (EAR) for export control.

Description

The G-2000 provides high accuracy for platform/gimbal stabilization and targeting applications. More than 75,000 gyros have been delivered since 1992 for use in a wide variety of military and commercial applications around the world.

The G-2000 requires control electronics and power conditioning to provide rate outputs (e.g., delta thetas). This is accomplished using a Northrop Grumman miniature Digital Gyro Control Unit (DGCU) servo card specifically designed to maximize G-2000 performance, or these can be incorporated into the host application.

Using a single input voltage source (11 to 34 Volt DC), the DGCU includes all power regulation circuitry and software needed to operate the G-2000 gyro. The DGCU offers digital RS-422 synchronous 21.6 kHz outputs.

Applications






- Downhole drilling and North-Finding
- Line-of-Sight stabilization
- Tactical missile and torpedo guidance/navigation
- Ground vehicle navigation
- Electro-optical/infrared cameras (EO/IR)
- Targeting and pointing
- Gun/turret stabilization

Advantages

The two-axis G-2000 gyroscope offers superior performance, high Mean Time Between Failure (MTBF), light weight, small volume and low operating power. The G-2000 is well-suited for high vibration and high shock environments where fiber-optic or micro-electro-mechanical gyros are unable to perform. Key advantages of the G-2000 include:

- Small size (.37 cubic inches) and light weight (<25 grams)
- Angle Random Walk of $<0.005^\circ/\sqrt{\text{hr}}$
- Random drift of 0.02° to $0.6^\circ/\text{hr}$, 1σ
- High shock capability of 750 g's (2 μsec , 1/2 sine)
- High MTBF of 100,000 hours
- Low power consumption
- Fully qualified to MIL-spec performance
- DGCU servo card option for turnkey, enhanced performance.

	G-2000 Gyro		G-2000 with DGCU	
Parameters	Performance			
Random Drift (in-run stability)	0.02° to 0.6°/hr, 1 σ			
Angle Random Walk	<0.005°/hr			
Threshold (Resolution)	0.0003°/sec			
Dynamic Range	$\pm 200^\circ$ /sec (continuous)			
Torquer Scale Factor (TSF)	1445 $\pm 5\%$ °/hr/mA			
TSF Non-linearity	<200 PPM			
Gyro Axis Misalignment	0-1° (adjustable)			
G-Sensitive Drift	< $\pm 25^\circ$ /hr/g (adjustable)			
G ² -Sensitive Drift	0.3°/hr/g ²			
Motor Spin Frequency	800 Hz (16,000 RPM) (adjustable)			
Pickoff (PO) Scale Factor	7.0 $\pm 5\%$ Vrms/°			
PO Excitation	43.2 kHz, 6.5 Vrms			
Bandwidth (-90°)	270 Hz (adjustable)	120 Hz (adjustable)		
Parameters	Characteristics			
Dimensions	Gyro only: Length: 0.74 in (1.88 cm) Width: 0.75 in (1.91 cm) Height: 0.97 in (2.46 cm)	DGCU only: Length: 2.1 in (5.3 cm) Width: 1.4 in (3.56 cm) Height: 0.4 in (1 cm)		
Weight	<25 grams (gyro only)	<15 grams (DGCU only)		
Input Voltage	Start: 32 Vrms (0.5 amp) Run: 12 Vrms (0.15 amp)	11 to 34 VDC (20W for 3 sec, <4W continuous)		
Start Time	<1.4 sec	3 sec		
Digital Outputs Format	N/A	RS-422 synchronous		
Loop Rate	N/A	21.6 kHz		
Bit Rate	N/A	2.75 mbps		
Latency	N/A	<200 μ sec		
Transmit	N/A	96 bit-frame		
Parameters	Environmental			
Operating Temperature	-54°C to 100°C		-40°C to 85°C	
Storage Temperature (non-operational)	-54°C to 100°C			

G-2000 Family of Products	
G-2000 Gyro with DGCU card 2-axis Digital Gyro Control Unit	
LRS-2000 2-axis Analog Rate Sensor Assembly	
LRS-2001 3-axis Digital Rate Sensor Assembly	
LRS-2003 2-axis Digital Rate Sensor Assembly	
LR-2000 Digital Inertial Measurement Unit with micro-electromechanical accelerometers	

For more information, please contact:

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