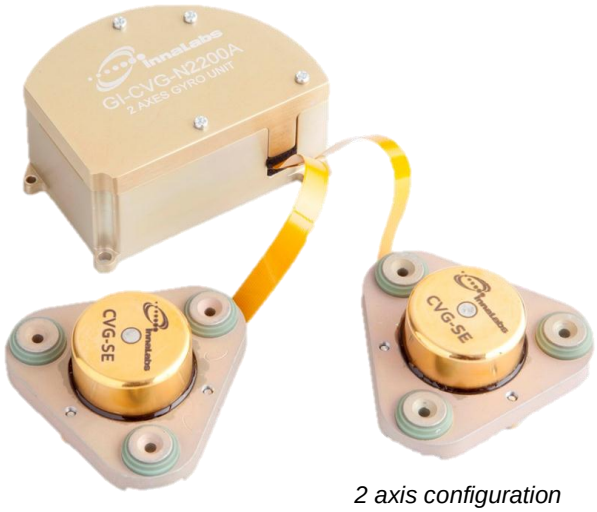
General description

The **InnaLabs® 2000 Family of Gyroscopes** is a <10°/hr range of tactical gyroscopes. Coming in a variety of form factors, the N2x00 group of parts is supplied without an external housing, to facilitate customised mounting solutions.

The GI-CVG-N2x00A analogue output family is suitable for a range of applications. The tactical performance, very low noise and high MTBF, combined with the small size make this gyroscope family the ideal choice for platform stabilisation.



2 axis configuration

Features

- In run Bias stability (room temperature) <0.22 °/hr (typical 0.07°/hr)
- Very low output noise (≤ 0.01 °/s RMS @ 100 Hz)
- Very High MTBF (500,000 hr)
- Large bandwidth (≥300 Hz)
- Robust (800 g shock)

Applications

The GI-CVG-N2x00A is particularly suited to the following applications:

- Platform Stabilisation of optical systems and payloads, or other sensitive systems on Airborne, Land-based or Marine platforms
- Stabilisation of Pointing and Directional systems
- Rail-tilt compensation systems
- Industrial control systems

Principles of Operation

Solid-state Coriolis Vibrating Gyros are based on the control of standing waves in a physical body, called a resonator (shown below, right) which is housed within a protective case (shown below, left). The protective case which contains the resonator is called a Sensitive Element (SE), and there is one such SE per axis in all InnaLabs® CVG gyroscopes.

The oscillations in the resonator are generated and detected by piezo-electric actuators, which are attached to the base of the resonator. A closed-loop electronic system is used to control the standing wave oscillation in the resonator, and to null the effects of Coriolis forces induced by the rotation of the resonator, providing as output a signal which is proportional to the gyroscope angular rate.

This electromechanical system is key to the very low output noise, and facilitates the large dynamic range required in several demanding applications.

How to order

The GI-CVG-N2x00A is available in 1-axis and 2-axis models, known as:

GI-CVG-N2100A – 1 axis version
GI-CVG-N2200A – 2 axis version

Related Products

InnaLabs® also offers a selection of accessories such as test breakout board, power supply board, and cables for use with the GI-CVG-N2x00A gyroscopes, which help bench and field-testing of these gyroscopes.

See our list of accessories for further details.

Specification

Parameter	Unit	Value	
		GI-CVG-N2100A	GI-CVG-N2200A
Number of axis		One	Two
Output format		Analogue	
Output interface	V DC	Differential +/- 7.04 VDC for full scale (Note #1)	
Temperature compensation (Bias, SF)		Yes	
Measurement range	deg/sec	±110	
Bandwidth (-3dB)	Hz	≥ 300	
In run Bias stability (room temp)	deg/hr	≤0.22 (0.07 typical)	
Bias stability, full temperature range, 1σ	deg/hr	≤ 10 (Note #2)	
Bias repeatability, turn-on to turn-on, 1σ	deg/hr	1 typical	
Angular Random Walk (steady conditions)	deg/√hr	0.01 typical	
Quiescent noise (1 – 100 Hz), RMS	deg/sec	≤ 0.01	
Scale factor error, full temperature range, 1σ	ppm	≤ 3500	
Scale factor linearity	ppm	≤ 1500	
Start up time	sec	1 sec typical	
Input signal (MIL STD 461 and 1275)	VDC	+12 VDC to +36 VDC	
Power consumption	Watt	< 1.7 @15V	< 2.3 @15V
Operational temperature	degC	-40 to +85	
Storage temperature	degC	-55 to +90	
Vibration, operational		3.63 g rms (DEF STAN 00-35) and 12 g rms, 5Hz-2kHz (Note #2)	
Shock	g, ms	800g, 0.6ms half sine (Note #2)	
MTBF, (MIL-HDBK 217F)	hours	500,000	
Lifetime	years	> 17	
Weight (Each sensitive element)	g	71	
Weight (Each damper)	g	26	
Weight (Electronics with Connectors)	g	90	100
Dimensions	mm	H25 x D29.4 (Sensitive Element)	
Built-in-self-test		Yes	

Note #1: Scale factor, nominal value: 32 mV/(deg/sec) +/- 3%
Note #2: Only applicable when the unit is rigidly fixed is an appropriate housing

If you wish to be automatically updated on future releases of this product datasheet, please contact your local InnaLabs® Sales Agent.

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