General description

The **Innalabs 2000 Family of Gyroscopes** is a <10°/hr range of tactical gyroscopes. Coming in a variety of form factors, the N2x10 group of parts is supplied without an external housing, to facilitate customized mounting solutions.

The GI-CVG-N2x10D digital 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 stabilization, north finding applications, as well as space vehicles control and navigation.

2 axis configuration

Features

- In run Bias stability (room temperature) 0.05°/hr typical
- Very low output noise (≤ 0.004 °/s RMS @ 100 Hz)
- Very High MTBF (500,000 hr)
- Moderate bandwidth (≥ 25 Hz)
- Robust (800 g shock)
- RS 422 interface

Applications

The GI-CVG-N2x10D is particularly suited to the following applications:

- **North Finding Applications**
- **Platform Stabilization** of optical systems and payloads, or other sensitive systems on Airborne, Land-based or Marine platforms
- **Satellites** and **space systems** attitude control and navigation
- Stabilization 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-N2x10D is available in 1-axis and 2-axis models, known as:

GI-CVG-N2110D – 1 axis version
GI-CVG-N2210D – 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-N2x10D gyroscopes, which help bench and field-testing of these gyroscopes.

See our list of accessories for further details.

Specification

Parameter	Unit	Value	
		GI-CVG-N2110D	GI-CVG-N2210D
Number of axis		One	Two
Output format		Digital	
Output interface		Asynchronous RS-422	
Output signal rate	Hz	7900	
Output data rate	Mbps	0.9375	
Measurement range	deg/sec	±20	
Bandwidth (-3dB)	Hz	≥ 25	
In run Bias stability (room temp.)	deg/hr	0.05 typical	
Bias stability, full temperature range, 1σ	deg/hr	≤ 10 (Note #1)	
Bias repeatability, turn-on to turn-on, 1σ	deg/hr	1 typical	
Angular Random Walk (steady conditions)	deg/√hr	0.003 typical	
Quiescent noise (1 – 100 Hz), RMS	deg/sec	≤ 0.004	
Scale factor error, full temperature range, 1σ	ppm	≤ 3500	
Scale factor linearity	ppm	≤ 1500	
Start up time	sec	≤ 10	
Input signal (MIL STD 461 and 1275)	VDC	+12 VDC to +36 VDC	
Power consumption	Watt	< 2.5 @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 #1)	
Shock	g, ms	800g, 0.6ms half sine (Note #1)	
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	105	
Dimensions	mm	H25 x D29.4 (Sensitive Element)	
Built-in-self-test		Yes	
Temperature compensation (Bias, SF)		Yes	

Note #1: 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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