



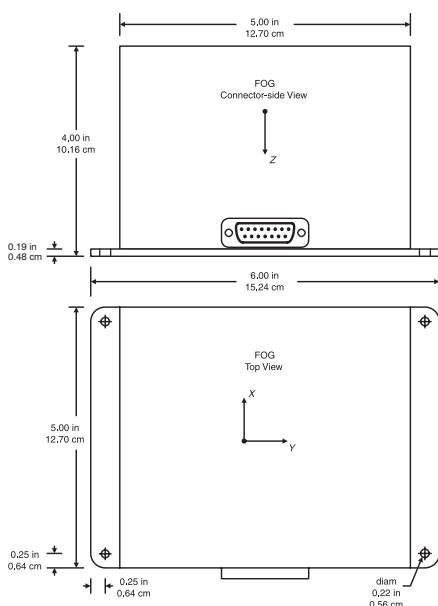
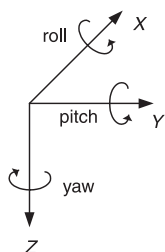
# VG700

## FIBER OPTIC VERTICAL GYRO

- Roll and Pitch Angle Measurement in Dynamic Environments
- Fiber Optic Gyro Stability < 20°/hr
- Fully Compensated Angular Rate and Linear Acceleration Outputs

## Applications

- UAV Flight Control
- Platform Stabilization
- Avionics



## VG700CB

The VG700CB is an intelligent vertical gyro for measuring roll and pitch angles in dynamic environments. The VG700CB uses MEMSIC's third generation Fiber Optic Rate Gyro technology resulting in superior performance, reliability, and stability over time. The new third generation FOG sensor provides excellent in-run bias stability of <20°/hr (constant temp.) and low noise.

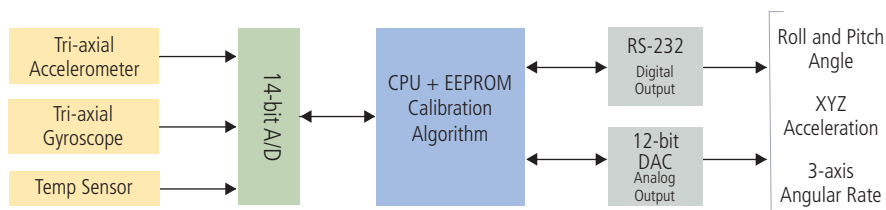
The VG700CB calculates stabilized roll and pitch angles by integrating the angular rate sensor outputs. The adaptive vertical erection algorithm is used to compensate for gyro bias-induced errors based on a long term gravity reference provided by the accelerometers. The "authority" of the drift correction can be set via the serial command 'T' (refer to the User Manual). The high stability fiber optic gyros allow a low 'T' setting which minimizes low 'T' setting which

minimizes the effect of "false" gravity references during extreme maneuvers and therefore provides better overall accuracy in dynamic environments.

Example applications include UAV flight control, avionics, and platform stabilization.

The VG700CB measures acceleration and rotation rate about three orthogonal axes. The VG700CB employs on-board digital processing to provide a factory calibrated unit with internal compensation for deterministic error sources.

Each Inertial System comes with a User's Manual offering helpful hints on programming, installation, and product information. In addition, MEMSIC's GYRO-VIEW software is included to assist you in system development and evaluation, and allows you to perform data acquisition.



VG Block Diagram

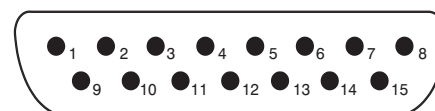
Specifications	VG700CB-200	Remarks
<b>Performance</b>		
Update Rate (Hz)	>100	Continuous Update Mode
Start-up Time Valid Data (sec)	< 1	
<b>Attitude</b>		
Range: Roll, Pitch (°)	± 180, ± 90	
Static Accuracy (° pk-pk)	< 1.5	
Dynamic Accuracy (° rms)	< 2.5	
Resolution (°)	< 0.1	
<b>Angular Rate</b>		
Range: Roll, Pitch, Yaw (°/sec)	± 200	
Bias: Roll, Pitch, Yaw (°/hr)	<± 20	Constant temp.
Scale Factor Accuracy (%)	< 2	Over temp.
Non-Linearity <sup>1</sup> (% FS)	< 1	Up to 100 °/sec
Resolution (°/sec)	< 0.025	
Bandwidth (Hz)	> 100	-3 dB point
Random Walk (°/hr <sup>1/2</sup> )	< 0.4	
<b>Acceleration</b>		
Range: X/Y/Z (g)	± 4	
Bias: X/Y/Z (mg pk-pk)	< 24	
Scale Factor Accuracy (%)	< 1	
Non-Linearity (% FS)	< 1	
Resolution (mg)	< 0.6	
Bandwidth (Hz)	> 10	-3 dB point
Random Walk (m/s/hr <sup>1/2</sup> )	< 1.0	
<b>Environment</b>		
Operating Temperature (°C)	-30 to +60	
Non-Operating Temperature (°C)	-55 to +85	
Non-Operating Vibration (g rms)	2	20 Hz - 2 KHz random
Non-Operating Shock (g)	90	1 ms half sine wave
<b>Electrical</b>		
Input Voltage (VDC)	10 to 30	
Input Current (A)	< 0.75	
Power Consumption (W)	< 8	At 15V DC
Digital Output Format	RS-232	
Analog <sup>2</sup> Range (VDC)	± 4.096	Pins 8, 9, 10, 12, 13, 14
	0 to 5.0	Pins 5, 6, 7
<b>Physical</b>		
Size (in)	5.0 x 6.0 x 4.0	Incl. mounting flanges
(cm)	12.70x15.24x10.16	Incl. mounting flanges
Weight (lbs)	< 3.5	
(kg)	< 1.6	
Connector	15 pin sub-miniature	"D", male

#### Notes

<sup>1</sup>Non-Linearity specified at less than 2% FS over entire range.

<sup>2</sup>All DAC analog outputs are fully buffered and are designed to interface directly to data acquisition equipment  
Specifications subject to change without notice

15 Pin "D" Connector Male Pinout



Pin	Function
1	RS-232 Transmit Data
2	RS-232 Receive Data
3	Input Power
4	Ground
5	X-axis accel voltage <sup>1</sup>
6	Y-axis accel voltage <sup>1</sup>
7	Z-axis accel voltage <sup>1</sup>
8	Roll-axis angular rate <sup>2</sup>
9	Pitch-axis angular rate <sup>2</sup>
10	Yaw-axis angular rate <sup>2</sup>
11	NC – Factory use only
12	Roll angle/X-axis acceleration <sup>3</sup>
13	Pitch angle/Y-axis acceleration <sup>3</sup>
14	Not used/Z-axis acceleration <sup>3</sup>
15	NC – Factory use only

#### Notes

<sup>1</sup> The accelerometer voltage outputs are taken directly from the accelerometers without compensation or scaling.

<sup>2</sup> The angular rate analog outputs are scaled to represent degrees/second. Outputs are created by a D/A converter.

<sup>3</sup> Actual output depends on VG measurement mode.

Pin Diagram



## Ordering Information

Model	Description	Gyro (°/sec)	Accel (g)
VG700CB-200	Fiber Optic Vertical Gyro	± 200	± 4

CALL FACTORY FOR OTHER CONFIGURATIONS

This product has been developed exclusively for commercial applications. It has not been tested for, and makes no representation or warranty as to conformance with, any military specifications or its suitability for any military application or end-use. Additionally, any use of this product for nuclear, chemical or biological weapons, or weapons research, or for any use in missiles, rockets, and/or UAV's of 300km or greater range, or any other activity prohibited by the Export Administration Regulations, is expressly prohibited without the written consent and without obtaining appropriate US export license(s) when required by US law. Diversion contrary to U.S. law is prohibited. Specifications are subject to change without notice.

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