VG800

ADVANCED MEMS VERTICAL GYRO

- Advanced MEMS Sensors
- Low Drift < 3°/hr
- High Reliability, MTBF > 20,000 hrs
- Stabilized Roll and Pitch Angle Outputs
- Fully Compensated Angular Rate and Linear Acceleration Outputs
- Digital (RS-232) and Analog Outputs
- Plug-In Compatible with VG700CB

Applications

- UAV Flight Control
- Platform Stabilization
- Avionics

VG800CA

The VG800CA is an intelligent vertical gyro for measuring roll and pitch angles in dynamic environments. The VG800CA incorporates advanced MEMS Rate Gyro technology resulting in superior performance, with in-run bias stability <3°/hr.

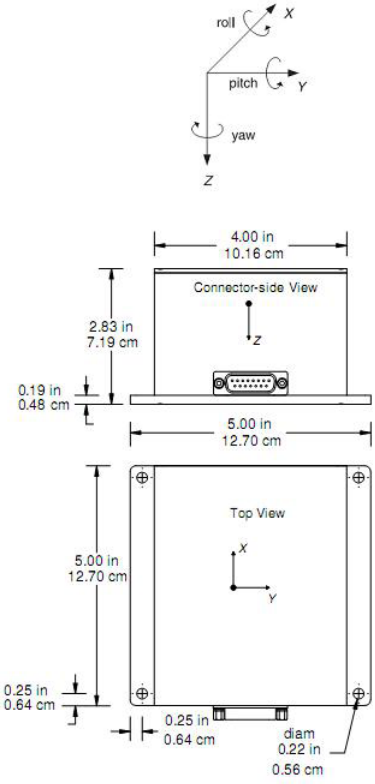
The VG800CA calculates stabilized roll and pitch angles by integrating the angular rate sensor outputs. The adaptive vertical erection algorithm is used to compensate for gyro bias-induced errors based on a long term gravity reference provided by the accelerometers.

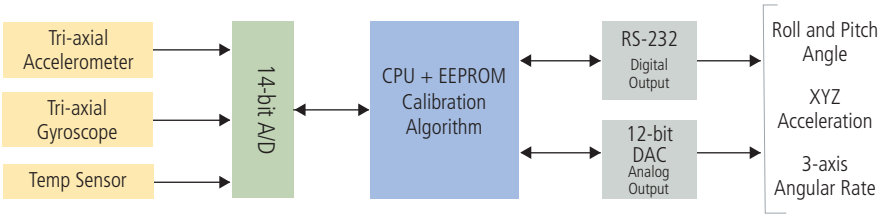
The "authority" of the drift correction can be set via the serial command 'T' (refer to the User Manual). The highly stable MEMS gyros allow a low 'T' setting which minimizes the effect of "false" gravity references during extreme maneuvers and therefore provides better overall accuracy in dynamic environments.

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

The VG800CA measures acceleration and rotation rate about three orthogonal axes. The VG800CA 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 to provide out-of-the-box data display and record capabilities.





VG Block Diagram

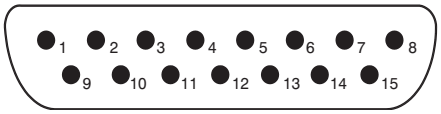
Specifications	VG800CA-200	Remarks
Performance		
Update Rate (Hz)	>100	Continuous Update Mode
Start-up Time Valid Data (sec)	< 1	
Attitude		
Range: Roll, Pitch (°)	± 180, ± 90	
Static Accuracy (° pk-pk)	< 0.3	
Dynamic Accuracy (° rms)	< 1.5	
Resolution (°)	< 0.1	
Angular Rate		
Range: Roll, Pitch, Yaw (°/sec)	± 200	
Bias In-Run (°/hr)	< 3	Constant temp, Allan Variance
Scale Factor Accuracy (%)	< 1	
Non-Linearity (% FS)	< 0.15	
Resolution (°/sec)	< 0.025	
Bandwidth (Hz)	25	-3 dB point
Random Walk (°/hr$^{1/2}$)	< 0.1	
Acceleration		
Range: X/Y/Z (g)	± 4	
Bias In-Run (mg)	< 1.0	Constant temp, Allan Variance
Scale Factor Accuracy (%)	< 1	
Non-Linearity (% FS)	< 1	
Resolution (mg)	< 0.5	
Bandwidth (Hz)	> 10	-3 dB point
Random Walk (m/s/hr$^{1/2}$)	< 0.5	
Environment		
Operating Temperature (°C)	-40 to +71	
Non-Operating Temperature (°C)	-55 to +85	
Non-Operating Vibration (g rms)	6	20 Hz - 2 KHz random
Non-Operating Shock (g)	100	1 ms half sine wave
Electrical		
Input Voltage (VDC)	10 to 30	
Input Current (A)	< 0.4	
Power Consumption (W)	< 5	At 15V DC
Digital Output Format	RS-232	
Analog[1] Range (VDC)	± 4.096	Pins 8, 9, 10, 12, 13, 14
	0 to 5.0	Pins 5, 6, 7
Physical		
Size (in)	5.0 x 5.0 x 2.83	Including mounting flanges
(cm)	12.70 x 12.70 x 7.19	Including mounting flanges
Weight (lbs)	< 3.5	
(kg)	< 1.6	
Connector	15 pin sub-miniature "D" male	

Notes

[1]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[1]
6	Y-axis accel voltage[1]
7	Z-axis accel voltage[1]
8	Roll-axis angular rate[2]
9	Pitch-axis angular rate[2]
10	Yaw-axis angular rate[2]
11	NC – Factory use only
12	Roll angle/X-axis acceleration[3]
13	Pitch angle/Y-axis acceleration[3]
14	Not used/Z-axis acceleration[3]
15	NC – Factory use only

Notes

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

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

3 Actual output depends on VG measurement mode.

Pin Diagram

Ordering Information

Model	Description	Gyro (°/sec)	Accel (g)
VG800CA-200	Advanced MEMS Vertical Gyro	± 200	± 4

CALL FACTORY FOR OTHER CONFIGURATIONS