Crossbøw

VG440 MEMS-BASED VERTICAL GYRO SYSTEMS

- Roll, Pitch, and Open-loop Free Heading Angles with 3-Axis Acceleration and Angular Rate Outputs
- GPS Position/Velocity Aiding Input
- Fully Compensated Over Wide Temperature Range
- High Stability MEMS Sensors
- 100 Hz Output Data
- Enhanced Performance Kalman Filter Algorithm
- EMI & Vibration Resistant
- Environmentally Sealed

Applications

- Unmanned Vehicle Control
- Land Vehicle Guidance
- Platform Stabilization





Package Dimensions

VG440CA

The Crossbow VG440 is a MEMS-Based Vertical Gyro System that provides an unmatched value in terms of both price and performance. Developed in response to over a decade of extensive application experience in a wide variety of airborne, marine, and land applications, the VG440 incorporates many new and enhanced design features including:

- Configurable high-performance Extended Kalman Filter (EKF) algorithms tunable to a wide range of applications
- Water resistant, vibration resistant, lightweight design
- EMI protection for trouble-free operation
- Continuous Built-in-Test
- External GPS Input for Position/velocity aiding

The VG440 operates as a standalone vertical gyro. Attitude performance can be enhanced by using the GPS Position/Velocity aiding input.

Each VG440 system comes with a User's Manual and Crossbow's NAV-VIEW 2.0 software to assist users with system development, evaluation, and basic data acquisition.



VG440 Block Diagram

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Specifications	VG440CA-200	Remarks		
Performance				
Update Rate ¹ (Hz)	2-100	Programmable		
Start-up Time Valid Data (sec)	< 1			
Fully Stabilized Data (sec)	< 60	Under static conditions		
Heading ²				
Range (°)	± 180			
Accuracy (° rms)	< 2.0	With external GPS aiding		
Resolution (° rms)	< 0.1			
Attitude				
Range: Roll, Pitch (°)	± 180, ± 90			
Accuracy ³ (° rms)	< 0.75	With external GPS aiding		
Accuracy ³ (° rms)	< 1.5	Without external GPS aiding		
Resolution (°)	< 0.1			
Angular Rate				
Range: Roll, Pitch, Yaw (°/sec)	± 200			
Bias: Roll, Pitch, Yaw (°/sec)	< ± 0.1	Kalman filter stabilized		
Scale Factor Accuracy (%)	< 1			
Non-Linearity (% FS)	< 0.5			
Resolution (°/sec)	< 0.06			
Bandwidth (Hz)	25	-3 dB point nominal		
Random Walk (°/hr ^{1/2})	< 4.5			
Acceleration				
Input Range: X/Y/Z (g)	± 4			
Bias: X/Y/Z (mg)	< ±15	Full temperature range		
Scale Factor Accuracy (%)	< 1			
Non-Linearity (% FS)	< 1			
Resolution (mg)	< 0.6			
Bandwidth (Hz)	25	-3 dB point nominal		
Random Walk (m/s/hr ^{1/2})	< 1.0			
Environment				
Operating Temperature (°C)	-40 to +71			
Non-Operating Temperature (°C)	-55 to +85			
Enclosure ⁴	IP66 Compliant			
Electrical				
Input Voltage (VDC)	9 to 42			
Input Current (mA)	< 350	At 12 VDC nominal		
Power Consumption (W)	< 5			
Digital Output Format	RS-232			
Physical				
Size (in)	3 x 3.75 x 2.50	With mounting flanges		
(cm)	7.62 x 9.53 x 6.43	With mounting flanges		
Weight (lbs)	< 1.3			
(kg)	< 0.58			
Connector	15 pin "D" male			

15 Pin "D" Connector Male Pinout



Pin	Signal	
1	RS-232 Transmit Data	
2	RS-232 Receive Data	
3	Positive Power Input (+Vcc)	
4	Power Ground	
5	Chassis Ground	
6	NC - Factory use only	
7	RS-232 GPS Aiding Tx	
8	RS-232 GPS Aiding Rx	
9	Signal Ground	
10	1PPS OUT	
11	1PPS IN	
12	NC – Factory use only	
13	BIT OUT	
14	NC – Factory use only	
15	NC – Factory use only	

VG440 Pin Diagram



Specifications subject to change without notice.

Notes:

¹ See User's Manual for additional information.

² Accurate heading data only available when GPS is available and vehicle is in motion. See User's Manual for additional information.

³ Dynamic conditions, Aggressive Crossbow flight test profile.

⁴ IP66 Compliant without EMI filter attached.

Ordering Information

Model	Description	Gyro (°/sec)	Accel (g)
VG440CA-200-1	MEMS-Based Vertical Gyro System - includes: CD ROM, User's Manual, Quick Start Guide, and cable	± 200	± 4

CALL FACTORY FOR OTHER CONFIGURATIONS

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