IMU700

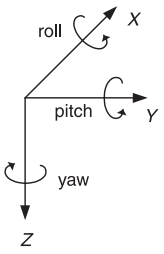
FIBER OPTIC GYRO BASED IMU

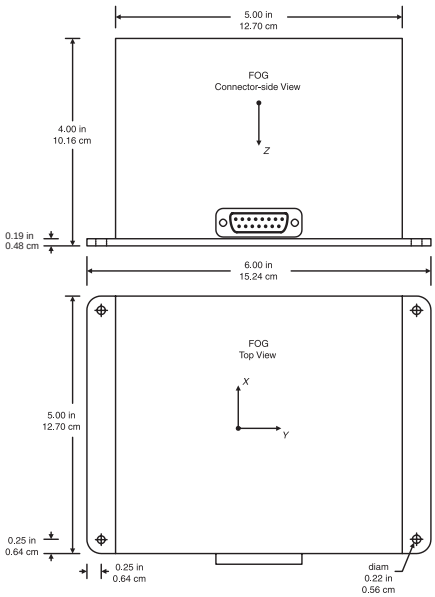
- High Bandwidth Angular Rate and Linear Acceleration Measurement
- Fiber Optic Gyro Stability < 20°/hr
- Analog and Digital Outputs
- No Calibration Required



Applications

- Control and Stabilization
- Avionics
- Instrumentation





IMU700CB

The IMU700CB is a six-degree-of-freedom (6DOF) Inertial Measurement Unit that provides accurate monitoring of linear acceleration and angular rate. The IMU700CB uses Crossbow's third generation fiber optic rate gyro technology resulting in superior performance, reliability, and stability over time. The third generation FOG sensor provides excellent in-run bias stability of <20°/hr (constant temp) and low noise. Example applications include platform stabilization, dynamic testing and avionics.

The IMU700CB offers wide bandwidth measurement of acceleration and rotation rate about three orthogonal axes. The IMU700CB employs on-board digital signal processing to sample data, compensate for deterministic errors, and format digital and analog outputs in engineering units.

The IMU700CB sensing elements are solid-state devices that have no moving parts. The three fiber optic rate gyros employ the Sagnac effect to measure angular rate independently of acceleration. The three accelerometers are silicon MEMS devices that use differential capacitance to sense acceleration. The IMU700CB has three output options (one analog and two digital modes) to allow for easy integration into measurement and control systems.

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

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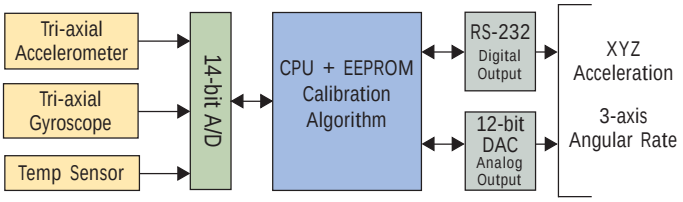
Specifications	IMU700CB-200	Remarks
Performance		
Update Rate (Hz)	> 125	Continuous Update Mode
Start-up Time Valid Data (sec)	< 1	
Angular Rate		
Range Roll, Pitch, Yaw (°/sec)	± 200	
Bias: Roll, Pitch, Yaw (°/hr)	< ± 20	Constant temp.
Scale Factor Accuracy (%)	< 2	Over temp.
Non-Linearity[1] (% FS)	< 1	Up to 100 °/sec
Resolution (°/sec)	< 0.025	
Bandwidth (Hz)	> 100	-3 dB point
Random Walk (°/hr$^{1/2}$)	< 0.4	
Acceleration		
Range X/Y/Z (g)	± 4	
Bias: X/Y/Z (mg)	<± 12	
Scale Factor Accuracy (%)	< 1	
Non-Linearity (% FS)	< 1	
Resolution (mg)	< 0.6	
Bandwidth (Hz)	> 75	-3 dB point
Random Walk (m/s/hr$^{1/2}$)	< 1.0	
Environment		
Operating Temperature (°C)	-40 to +60	
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)	< 0.75	
Power Consumption (W)	< 8	@ 15V
Digital Output Format	RS-232	
Analog[2] 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 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:

[1] Non-Linearity specified at less than 2% FS over entire range.

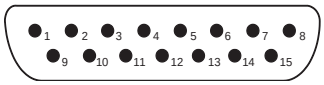
[2] All DAC analog outputs are fully buffered and are designed to interface directly to data acquisition equipment.

Specifications subject to change without notice



IMU Block Diagram

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	X-axis acceleration[3]
13	Y-axis acceleration[3]
14	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 The acceleration outputs are scaled to represent g. Outputs are created by a D/A converter.

Pin Diagram



Ordering Information

Model	Description	Gyro (°/sec)	Accel (g)
IMU700CB-200	Fiber Optic Inertial Measurement Unit	± 200	± 4

CALL FACTORY FOR OTHER CONFIGURATIONS