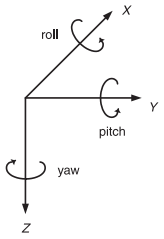
IMU300

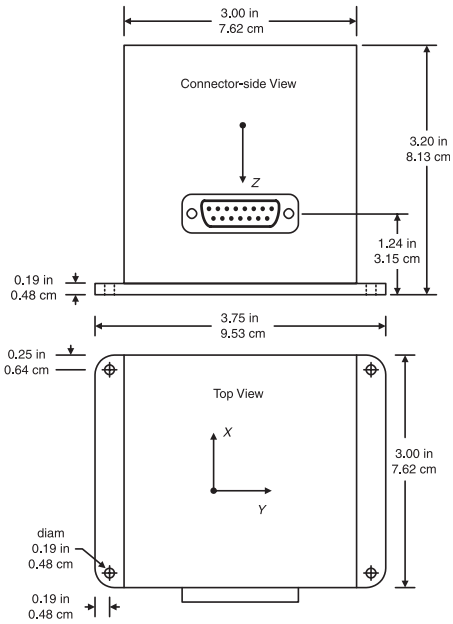
6DOF INERTIAL MEASUREMENT UNIT

- Fully Compensated Measurement of Angular Rate and Linear Acceleration
- Analog and Digital Outputs
- No Calibration Required

Applications

- General Instrumentation
- Vehicle Testing





IMU300CC

The IMU300CC is an intelligent six-degree-of-freedom (6DOF) Inertial System designed for general measurement of linear acceleration and angular rate in dynamic environments.

The IMU300CC uses a high performance Digital Signal Processor to provide outputs that are compensated for deterministic error sources within the unit. Internal compensation includes offset, scale factor and alignment.

All six of the IMU300CC sensing elements are solid-state devices. The three angular rate sensors are bulk micro-machined vibratory MEMS sensors that utilize Coriolis force to measure angular rate independently of acceleration. The three MEMS accelerometers are surface micro-machined silicon devices that use differential capacitance to sense acceleration.

New design features in the IMU300CC provide significant reductions in both vibration and EMI sensitivity.

The IMU300CC offers both analog and digital outputs for easy system integration. Two user-selectable digital output modes are provided. In scaled sensor mode, the sensor signals are sampled, converted to digital data, compensated and scaled to engineering units. In voltage mode, the sensor signals are sampled and converted to digital data in voltage units.

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.

inertial systems

Document Part Number: 6020-0019-01 Rev D

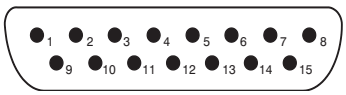
Specifications		IMU300CC-100	Remarks
Performance			
Update Rate (Hz)		> 100	Continuous Update Mode
Start-up Time Valid Data (sec)		< 1	
Angular Rate			
Range: Roll, Pitch, Yaw (°/sec)		± 100	
Bias: Roll, Pitch, Yaw (°/sec)		< ± 2.0	
Scale Factor Accuracy (%)		< 1	
Non-Linearity (% FS)		< 0.3	
Resolution (°/sec)		< 0.025	
Bandwidth (Hz)		> 25	-3 dB point
Random Walk (°/hr$^{1/2}$)		< 2.25	
Acceleration			
Range: X/Y/Z (g)		± 2	
Bias: X/Y/Z (mg)		<± 30	
Scale Factor Accuracy (%)		< 1	
Non-Linearity (% FS)		< 1	
Resolution (mg)		< 1.0	
Bandwidth (Hz)		> 75	-3 dB point
Random Walk (m/s/hr$^{1/2}$)		< 0.15	
Environment			
Operating Temperature (°C)		-40 to +85	
Non-Operating Temperature (°C)		-55 to +85	
Non-Operating Vibration (g rms)		6	20 Hz - 2 KHz random
Non-Operating Shock (g)		1000	1 ms half sine wave
Electrical			
Input Voltage (VDC)		9 to 30	
Input Current (A)		< 250	
Power Consumption (W)		< 3	At 12V DC
Digital Output Format		RS-232	"See Digital Data Format"
Analog[1] Range (VDC)		± 4.096	Pins 8, 9, 10, 12, 13, 14
		0 to 5.0	Pins 5, 6, 7
Physical			
Size	(in)	3.0 x 3.75 x 3.20	Including mounting flanges
	(cm)	7.62 x 9.53 x 8.13	Including mounting flanges
Weight	(lbs)	< 1.3	
	(kg)	< 0.59	
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	X-axis acceleration[3]
13	Y-axis acceleration[3]
14	Z-axis acceleration[3]
15	NC – Factory use only

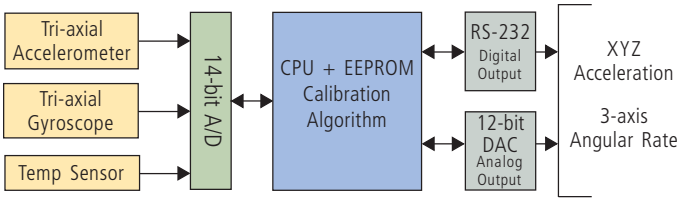
Notes

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 Actual output depends on IMU measurement mode.

Pin Diagram



IMU Block Diagram

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Ordering Information

Model	Description	Gyro (°/sec)	Accel (g)
IMU300CC-100	6-Axis Inertial Measurement Unit	± 100	± 2

CALL FACTORY FOR OTHER CONFIGURATIONS

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