

IMU

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.

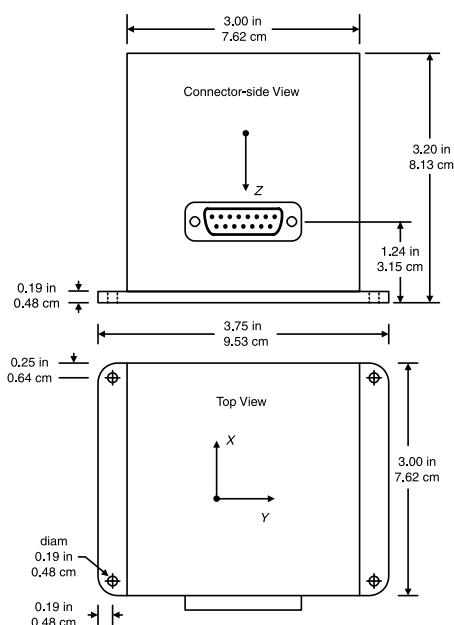
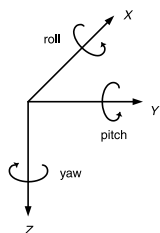
The IMU300CC uses a high performance Digital Signal Processor to provide outputs that are compensated for deterministic error sources within the unit. Internal compensation includes offset, scale factor, and alignment.

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

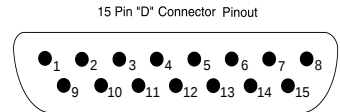
acceleration. New design features in the IMU300CC provide significant reductions in both vibration and EMI sensitivity.

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.



Specifications	IMU300CC-100	Remarks
Performance		
Update Rate (Hz)	> 100	Continuous Update Mode
Start-up Time Valid Data (sec)	< 1	
Angular Rate ¹		
Range: Roll, Pitch, Yaw (°/sec)	± 100	-3 dB point
Bias: Roll, Pitch, Yaw (°/sec)	<± 2.0	
Scale Factor Accuracy (%)	< 1	
Non-Linearity (% FS)	< 0.3	
Resolution (°/sec)	< 0.025	
Bandwidth (Hz)	> 25	
Random Walk (°/hr ^{1/2})	< 2.25	
Acceleration		
Range X/Y/Z (g)	± 2	-3 dB point
Bias: X/Y/Z (mg)	<± 30	
Scale Factor Accuracy (%)	< 1	
Non-Linearity (% FS)	< 1	
Resolution (mg)	< 1.0	
Bandwidth (Hz)	> 75	
Random Walk (m/s/hr ^{1/2})	< 0.15	
Environment		
Operating Temperature (°C)	-40 to +85	20 Hz - 2 KHz random 1 ms half sine wave
Non-Operating Temperature (°C)	-55 to +85	
Non-Operating Vibration (g rms)	6	
Non-Operating Shock (g)	1000	
Electrical		
Input Voltage (VDC)	9 to 30	at 12 VDC
Input Current (mA)	< 250	
Power Consumption (W)	< 3	"See Digital Data Format"
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)	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	



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

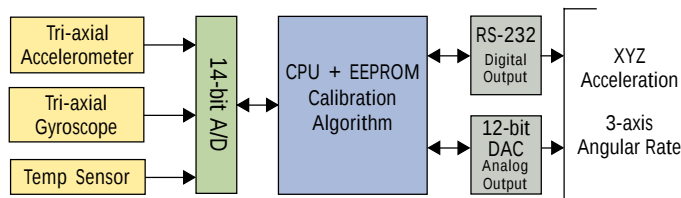
Notes

- The accelerometer voltage outputs are taken directly from the accelerometers without compensation or scaling.
- The angular rate analog outputs are scaled to represent degrees/second. Outputs are created by a D/A converter.
- Actual output depends on IMU measurement mode.

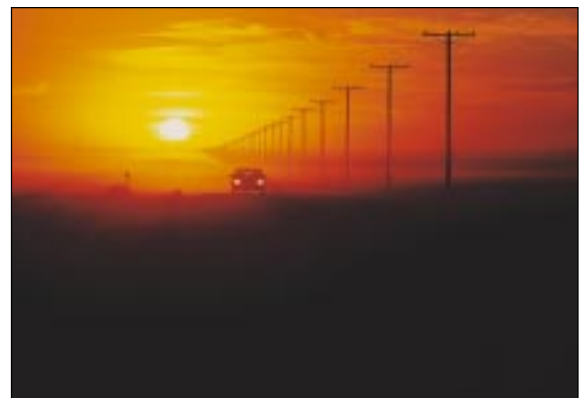
Pin Diagram

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



IMU Block Diagram



Ordering Information

Model	Previous Model	Description	Gyro (°/sec)	Accel (g)
IMU300CC-100	IMU300CB-100	6-Axis Inertial Measurement Unit	±100	± 2

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