

3DM™-CV5™-10

Inertial Measurement Unit (IMU)

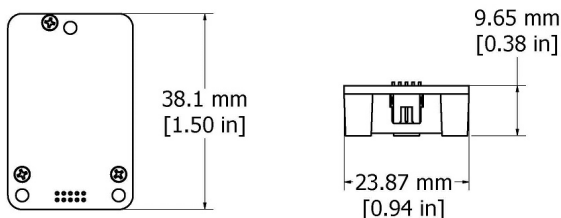


3DM-CV5-10 - miniature, industrial-grade inertial measurement unit (IMU)

The **LORD Sensing 3DM-CV5** family of industrial-grade, board-level inertial sensors provides a wide range of triaxial inertial measurements and computed attitude and navigation solutions.

In all models, the Inertial Measurement Unit (IMU) includes direct measurement of acceleration and angular rate, and are fully temperature-compensated and calibrated over the operating temperature. The use of Micro-Electro-Mechanical System (MEMS) technology allows for highly accurate, small, lightweight devices.

The LORD Sensing **MIP Monitor** software can be used for device configuration, live data monitoring, and recording. Alternatively, the **MIP Data Communications Protocol** is available for development of custom interfaces and easy OEM integration.



Product Highlights

- Triaxial accelerometer, gyroscope, and temperature sensors achieve the optimal combination of measurement qualities
- Smallest, lightest, highest performance IMU in its class

Features and Benefits

Best in Class Performance

- Fully calibrated, temperature-compensated, and mathematically-aligned to an orthogonal coordinate system for highly accurate outputs
- High-performance, low-cost solution
- Direct PCB mount or chassis mount with ribbon cable
- Precision mounting alignment features

Ease of Use

- Easy integration via comprehensive and fully backwards-compatible communication protocol
- Robust, forward compatible MIP packet protocol

Cost Effective

- Out-of-the box solution reduces development time
- Volume discounts

Applications

- Platform stabilization, artificial horizon
- Health and usage monitoring of vehicles

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Specifications

General		
Integrated sensors	Triaxial accelerometer, triaxial gyroscope, and temperature sensors	
Data outputs	Inertial Measurement Unit (IMU) outputs: acceleration, angular rate, delta theta, delta velocity	
Inertial Measurement Unit (IMU) Sensor Outputs		
	Accelerometer	Gyroscope
Measurement range	±8 g (standard) ±2 g, ±4 g (optional)	±500°/sec (standard) ±250°, ±1000°/sec (optional)
Non-linearity	±0.04% fs	0.06% fs
Bias instability	±0.04 mg	8°/hr
Initial bias error	±0.004 g	0.1°/sec
Scale factor stability	±0.05%	±0.05%
Noise density	100 µg/√Hz	0.0075°/sec/√Hz (300°/sec)
Alignment error	±0.05°	±0.05°
Adjustable bandwidth	500 Hz (max)	500 Hz (max)
Offset error over temperature	0.2% (typ)	0.1% (typ)
Gain error over temperature	0.05% (typ)	0.06% (typ)
Scale factor non-linearity (@ 25° C)	0.04% (typ) 0.2% (max)	0.04% (typ) 0.15% (max)
IMU filtering	Digital averaging filter (user adjustable) sampled at 2 kHz and scaled into physical units; coning and sculling integrals computed at 1 kHz	
Sampling rate	2 kHz	2 kHz
IMU data output rate	1 Hz to 1000 Hz	
Pressure Sensor		
Range	260 to 1260 hPa	
Resolution	0.01 hPa	
Noise	0.01 hPa RMS	
Sampling rate	25 Hz	

Operating Parameters	
Communication	TTL serial (3.0 V dc, 9,600 bps to 921,600 bps, default 115,200)
Power source	+ 3.2 to 5.2 V dc
Power consumption	100 mW (typ)
Operating temperature	-40 °C to +85 °C
Mechanical shock limit	500 g (calibration unaffected) 1000 g (bias may change), 5000 g (survivability)
Physical Specifications	
Dimensions	38 mm x 24 mm x 9.7 mm
Weight	8 grams
Enclosure material	Aluminum
Regulatory compliance	ROHS, CE
Integration	
Connectors	Data/power output: Samtec FTSH Series (FTSH-105-01-F-D-K)
Software	MIP Monitor , Windows XP/Vista/7/8/10 compatible
Compatibility	Protocol compatibility across 3DM-GX3, GX4, RQ1, GQ4, and GX5 product families
Software development kit (SDK)	MIP data communications protocol with sample code available (OS and platform independent)

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