LORD **DATASHEET**

3DM®-CV5-10

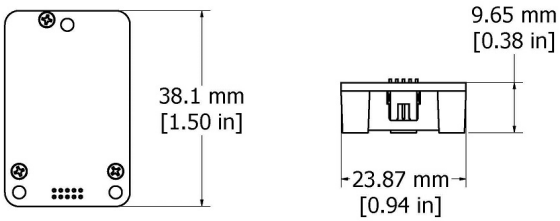
Inertial Measurement Unit (IMU)

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, angular rate, delta theta, and delta velocity. Compensation options include automatic compensation for magnetic anomalies, gyro and accelerometer noise, and noise effects. In models that include computed outputs, sensor measurements are processed through and auto-adaptive estimation filter algorithm to produce high accuracy computed outputs under dynamic conditions. The computed outputs vary between models and can include roll, pitch and yaw. All sensors are fully temperature- compensated and calibrated over the operating temperature. The use of Micro-Elector- Mechanical System (MEMS) technology allows for highly accurate, small, light-weight devices.

The LORD Sensing MIP Monitor software can be used for device configuration, live data monitoring, and recording. Alternatively, the LORD Sensing 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

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
Resolution	0.05 m*g* (+/- 8 g)	0.003°/sec (500 dps)
Bias instability	±0.08 m*g*	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 (500°/sec)
Alignment error	±0.05°	±0.08°
Bandwidth	225 Hz	500 Hz
Offset error over temperature	0.2% (typ)	0.1% (typ)
Gain error over temperature	±0.05% (typ) ±0.2% (max)	±0.1% (typ) ±0.4 (max)
IMU filtering	First stage sigma delta Analog to Digital Converter sampled at 1kHz. Second stage user adjustable digital low pass filter.	
Sampling rate	1 kHz	1kHz
IMU data output rate	1 Hz to 1000 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	360 mW (typ), 500 mW (max)
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	11 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, GX5 and CV5 product families
Software development kit (SDK)	MIP data communications protocol with sample code available (OS and platform independent)

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