LORD **DATASHEET**

3DM®-GX5-10

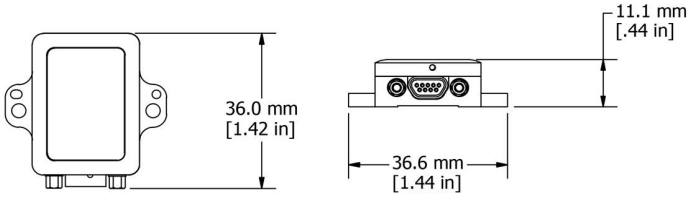
Inertial Measurement Unit (IMU)

3DM-GX5-10- *high-performance, industrial-grade inertial measurement unit (IMU)*

The **LORD Sensing 3DM-GX5** family of high-performance, industrial-grade 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, 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-drift gyros with noise density of 0.005°/sec/√Hz and VRE of 0.001°/s/g^2RMS
- Accelerometer noise as low as 25 ug/√Hz

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*, ±20 *g*, ±40 *g* (optional)	300°/sec (standard) ±75, ±150, ±900° /sec (optional)
Non-linearity	±0.02% fs	±0.02% fs
Resolution	0.02 m*g* (+/- 8 g)	0.003°/sec (300 dps)
Bias instability	±0.04 mg	8°/hr
Initial bias error	±0.002 *g*	±0.04°/sec
Scale factor stability	±0.03%	±0.05%
Noise density	25 µg/√Hz (2 *g*)	0.005°/sec/√Hz (300°/sec)
Alignment error	±0.05°	±0.05°
Bandwidth	225 Hz	250 Hz
Offset error over temperature	0.06% (typ)	0.04% (typ)
Gain error over temperature	0.03% (typ)	0.03% (typ)
Vibration induced noise	--	0.072°/s RMS/*g* RMS
Vibration rectification error (VRE)	0.03%	0.001°/s/g^2 RMS
IMU filtering	Digital sigma-delta ADC sampled at 1kHz and 4kHz. 4kHz data averaged to 1kHz nominal sampling rate. Scaled into physical units at 1kHz. User adjustable IIR filter available for 1kHz data. Coning and sculling integrals computed at 1kHz.	
Sampling rate	1 kHz	4 kHz
IMU data output rate	1 Hz to 1000 Hz	

Operating Parameters	
Communication	RS232 (9,600 bps to 921,600 bps, default 115,200)
Power source	+4 to + 36 V dc
Power consumption	300 mW (typ)
Operating temperature	-40 °C to +85 °C
Mechanical shock limit	500 *g* (calibration unaffected) 1000 *g* (bias may change), 5000 *g* (survivability)
MTBF	(TBD)
Physical Specifications	
Dimensions	36.0 mm x 36.6 mm x 11.1 mm
Weight	16.5 grams
Enclosure material	Aluminum
Regulatory compliance	ROHS, CE
Integration	
Connectors	Data/power output: micro-DB9
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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