

3DM-GX3-25-OEM™

OEM Attitude Heading Reference System (AHRS)

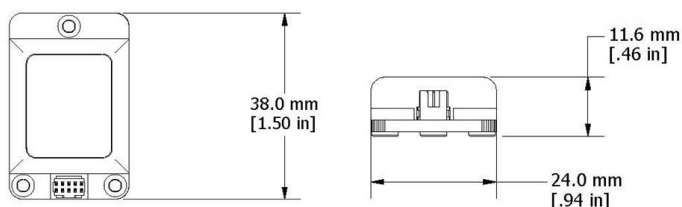


3DM-GX3-25-OEM™ - lower cost, miniature, industrial-grade attitude heading and reference system (AHRS) with integrated magnetometers, and OEM form factor

The LORD MicroStrain® family of **industrial** and **tactical 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, angular rate, and atmospheric pressure. Sensor measurements are processed through an on-board processor running a sophisticated estimation filter or fusion algorithm to produce high accuracy computed outputs with compensation options for magnetic and linear acceleration anomalies, sensor biases, auto-zero update, and noise offsets. The computed outputs vary between models and can include pitch, roll, yaw, a complete attitude, heading, and reference solution (AHRS) or a complete position, velocity and attitude solution (PVA), as well as integrated GNSS outputs. All sensors 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 MicroStrain® 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

- High performance integrated MEMS sensor technology provide direct inertial measurements, and computed attitude and heading outputs in a small package
- Triaxial accelerometer, gyroscope, magnetometer, and temperature sensors achieve the best combination of measurement qualities
- On-board processor runs a sophisticated Complimentary Filter (CF) fusion algorithm for precise attitude estimates and inertial measurements
- Sampling rates up to 30 KHz and data output up to 1 KHz
- Small size, lightweight packaging, and header connector interface ideal for OEM integration

Features and Benefits

Best in Class Performance

- Fully calibrated, temperature-compensated, and mathematically-aligned to an orthogonal coordinate system for highly accurate outputs

Ease of Use

- Easy integration via comprehensive and fully backwards-compatible communication protocol
- Common protocol between 3DM-GX3, GX4, RQ1, GQ4, and GX5 inertial sensor families for easy migration

Cost Effective

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

Applications

- Unmanned vehicle navigation
- Platform stabilization, artificial horizon
- Antenna and camera pointing
- Health and usage monitoring of vehicles

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Specifications

General			
Integrated sensors	Triaxial accelerometer, triaxial gyroscope, triaxial magnetometer, and temperature sensors,		
Data outputs	Inertial Measurement Unit (IMU) outputs: acceleration, angular rate, magnetic field, deltaTheta, deltaVelocity Computed outputs: attitude estimates (in Euler angles, quaternion, orientation matrix)		
Resolution	16 bit SAR oversampled to 17 bits		
Inertial Measurement Unit (IMU) Sensor Outputs			
	Accelerometer	Gyroscope	Magnetometer
Measurement range	±5 g (standard) ±1.7, ±16, and ±50g (option)	300°/sec (standard) ±50, ±600, ±1200 °/sec (options)	±2.5 Gauss
Non-linearity	±0.1 % fs	±0.03 % fs	±0.4% fs
Bias instability	±0.04 mg	18°/hr	--
Initial bias error	±0.002 g	±0.25°/sec	±0.003 Gauss
Scale factor stability	±0.05 %	±0.05 %	±0.1 %
Noise density	80 µg/√Hz	0.03°/sec/√Hz	100 µGauss/√Hz
Alignment error	±0.05°	±0.05°	±0.05°
Adjustable bandwidth	225 Hz (max)	440 Hz (max)	230 Hz (max)
IMU filtering	Digitally filtered (user adjustable) and scaled to physical input; coning and sculling integrals computed at 1 kHz		
Sampling rate	30 kHz	30 kHz	7.5 kHz
IMU data output rate	1 Hz to 1000 Hz		

Computed Outputs	
Attitude accuracy	±0.5° roll, pitch, and heading (static, typ), ±2.0° roll, pitch, and heading (dynamic, typ)
Attitude heading range	360° about all axes
Attitude resolution	< 0.01°
Attitude repeatability	0.2° (typ)
Calculation update rate	1000 Hz
Computed data output rate	1 Hz to 500 Hz
Operating Parameters	
Communication	USB 2.0, TTL serial UART (3.3 V dc, 9,600 bps to 921,600 bps, default 115,200)
Power source	+ 3.1 to + 5.5 V dc
Power consumption	80 mA at 5 V dc (USB)
Operating temperature	-40 °C to +70 °C
Mechanical shock limit	500 g
Physical Specifications	
Dimensions	38 mm x 24 mm x 11.6 mm
Weight	11.6 grams
Integration	
Connectors	Data/power output: Samtec FTSH Series (FTSH-105-01-F-D-K)
Software	MIP™ Monitor, Windows XP/Vista/7/8 compatible
Compatibility	Protocol compatibility across 3DM-GX3, GX4, RQ1, GQ1, and GX5 product families
Software development kit (SDK)	MIP™ data communications protocol with sample code available (OS and platform independent)

LORD SENSING
MicroStrain

LORD Corporation
MicroStrain® Sensing Systems
459 Hurricane Lane, Suite 102
Williston, VT 05495 USA

ph: 802-862-6629
sensing_sales@LORD.com
sensing_support@LORD.com