

3DM-GX3-15-OEM™

OEM Inertial Measurement and Vertical Reference Unit (IMU/VRU)

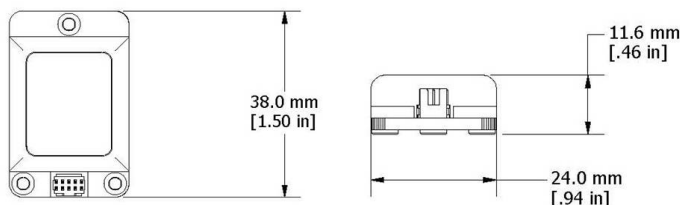


3DM-GX3-15-OEM™ - lower cost, miniature, industrial-grade inertial measurement unit (IMU) and vertical reference unit (VRU) in an OEM form factor

The LORD MicroStrain® 3DM-GX3® family of 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, angular rate, and atmospheric pressure. Sensor measurements are processed through an on-board processor running a sophisticated 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 GPS 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, real time measurement monitoring, and data recording. Alternatively, the MIP™ Data Communications Protocol is available for users who want to develop customized software solutions.



Best in Class Inertial Measurement

Product Highlights

- High performance integrated MEMS sensor technology provide direct and computed IMU and VRU outputs in a small package.
- Triaxial accelerometer, gyroscope, and temperature sensors achieve the best combination of measurement qualities.
- On-board processor runs a sophisticated Complimentary Filter (CF) fusion algorithm for precise inclination 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
- Bias tracking, error estimation, threshold flags, and adaptive noise modeling allow for fine tuning to conditions in each application.

Ease of Use

- Easy integration via comprehensive SDK
- Common protocol with the 3DM-GX4® and 3DM-RQ1™ 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

Specifications

General		
Integrated sensors	Triaxial accelerometer, triaxial gyroscope, and temperature sensors	
Data outputs	Inertial Measurement Unit (IMU) outputs: acceleration, angular rate, deltaTheta, deltaVelocity Computed outputs attitude estimates (Euler angles, quaternion, orientation matrix)	
Resolution	16 bit SAR oversampled to 17 bits	
Inertial Measurement Unit (IMU) Sensor Outputs		
	Accelerometer	Gyroscope
Measurement range	±5 g (standard) ±1.7, , and ±50g (option)	300°/sec (standard) ±50, ±600, ±1200 °/sec (options)
Non-linearity	±0.1 % fs	±0.03 % fs
Bias instability	±0.04 mg	18°/hr
Initial bias error	±0.002 g	±0.25°/sec
Scale factor stability	±0.05 %	±0.05 %
Noise density	80 µg/√Hz	0.03°/sec/√Hz
Alignment error	±0.05°	±0.05°
Adjustable bandwidth	225 Hz (max)	440 Hz (max)
IMU filtering	Digitally filtered (user adjustable) and scaled to physical inputs; coning and sculling integrals computed at 1 kHz	
Sampling rate	30 kHz	30 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
Regulatory compliance	ROHS
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 with 3DM-RQ1™ and 3DM-GX4® sensor families.
Software development kit (SDK)	MIP™ data communications protocol with sample code available (OS and computing platform independent)