

## 3DM-GX3-15-OEM™

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

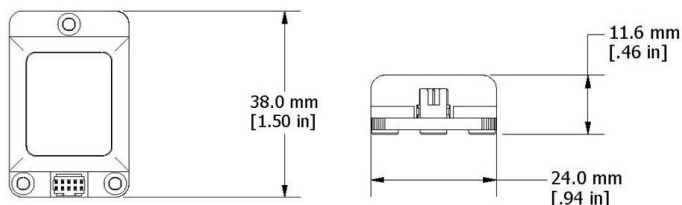


3DM-GX3-15-OEM™ - lower cost, miniature, industrial-grade inertial measurement unit (IMU) and vertical reference unit (VRU) in an OEM form factor

The LORD MicroStrain® 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 vertical reference 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

#### 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

# 3DM-GX3-15-OEM™ OEM Inertial Measurement and Vertical Reference Unit (IMU/VRU)

## Specifications

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

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

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