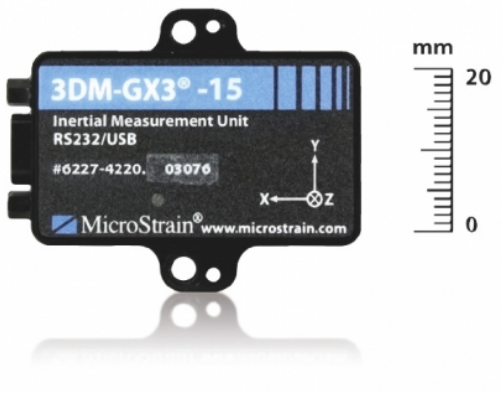
# 3DM-GX3® -15

## Miniature Inertial Measurement Unit And Vertical Gyro

The 3DM-GX3® -15 is a high-performance, miniature Inertial Measurement Unit and Vertical Gyro, utilizing MEMS sensor technology. It combines a triaxial accelerometer, triaxial gyro, temperature sensors, and an on-board processor running a sophisticated sensor fusion algorithm to provide static and dynamic orientation, and inertial measurements.




## Features & Benefits

***Best in Class***

- precise inertial measurements
- high-speed sample rate & flexible data outputs
- high performance under vibration

**Easiest to Use**

- smallest, lightest industrial IMU available
- simple integration supported by SDK and comprehensive API

**Cost Effective**

- reduced cost and rapid time to market for customer's applications
- aggressive volume discount schedule

## Applications

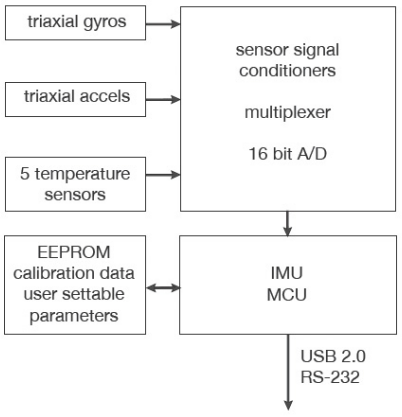
Accurate orientation and positioning under dynamic conditions such as:

- Inertial Aiding of GPS
- Unmanned Vehicle Navigation
- Platform Stabilization, Artificial Horizon
- Antenna and Camera Pointing
- Health and Usage Monitoring of Vehicles
- Reconnaissance, Surveillance, and Target Acquisition
- Robotic Control
- Personnel Tracking

## System Overview

The 3DM-GX3® -15 offers a range of fully calibrated inertial measurements including acceleration, angular rate, deltaTheta, and deltaVelocity vectors. It can also output computed orientation estimates including Euler angles (pitch and roll), rotation matrix and quaternion. All quantities are fully temperature compensated and are mathematically aligned to an orthogonal coordinate system. The angular rate quantities are further corrected for g-sensitivity and scale factor non-linearity to third order. The 3DM-GX3® -15 architecture has been carefully designed to substantially eliminate common sources of error such as sensitivity to supply voltage variations. On-board coning and sculling compensation allows for use of lower data output rates while maintaining performance of a fast internal sampling rate.

The 3DM-GX3® -15 is initially sold as a starter kit consisting of an IMU module, RS-232 or USB communication and power cable, software CD, user manual, and quick start guide.

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SENSING SYSTEMS

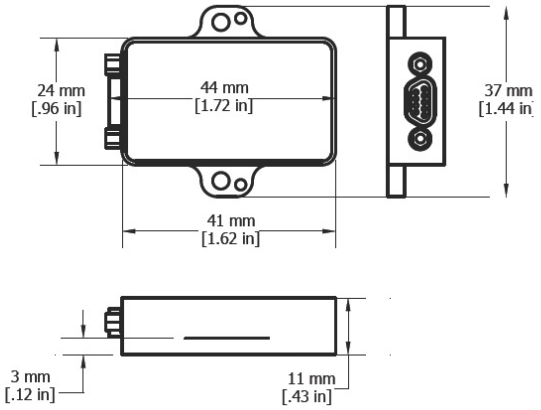
# Specifications

**IMU Specifications**

| Attitude and Heading | |
|---|---|
| Attitude heading range | 360° about all 3 axes |
| Accelerometer range | ±5 *g* standard |
| Gyroscope range | ±300°/sec standard |
| Static accuracy | ±0.5° pitch and roll typical for static test conditions |
| Dynamic accuracy | ±2.0° pitch and roll for dynamic (cyclic) test conditions and for arbitrary angles |
| Long term drift | pitch and roll drift eliminated by complementary filter architecture |
| Repeatability | 0.2° |
| Resolution | <0.1° |
| Data output rate | up to 1000 Hz |
| Filtering | sensors sampled at 30 kHz, digitally filtered (user adjustable ) and scaled into physical units; coning and sculling integrals computed at 1 kHz |
| Output modes | acceleration, angular rate, deltaTheta, deltaVelocity, Euler angles, quaternion, rotation matrix |
| General | |
| A/D resolution | 16 bits SAR oversampled to 17 bits |
| Interface options | USB 2.0 or RS232 |
| Baud rate | 115,200 bps to 921,600 bps |
| Power supply voltage | +3.2 to +16 volts DC |
| Power consumption | 80 mA @ 5 volts with USB |
| Connector | micro-DB9 |
| Operating temperature | -40° C to +70° C |
| Dimensions | 44 mm x 24 mm x 11 mm - excluding mounting tabs, width across tabs 37 mm |
| Weight | 18 grams |
| ROHS | compliant |
| Shock limit | 500 *g* |
| Software utility | CD in starter kit (XP/Vista/Win7 compatible) |
| Software development kit (SDK) | complete data communications protocol and sample code |

**Sensor Specifications**

| | Accels | Gyros |
|---|---|---|
| Measurement range | ±5 *g* | ±300°/sec |
| Non-linearity | ±0.1 % fs | ±0.03 % fs |
| In-run bias stability | ±0.04 m*g* | 18°/hr |
| Initial bias error | ±0.002 *g* | ±0.25°/sec |
| Scale factor stability | ±0.05 % | ±0.05 % |
| Noise density | 80 µ*g*/√Hz | 0.03°/sec/√Hz |
| Alignment error | ±0.05° | ±0.05° |
| User adjustable bandwidth | 225 Hz max | 440 Hz max |
| Sampling rate | 30 kHz | 30 kHz |
| Options | | |
| Accelerometer range | ±1.7 *g*, ±16 *g*, ±50 *g* | |
| Gyroscope range | ±50°/sec, ±600°/sec, ±1200°/sec | |



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