

LORD Sensing-MicroStrain® INERTIAL SENSORS

| SPECIFICATIONS | 3DM-GQ4-45 | 3DM-RQ1-45 | 3DM-GX5-45 | 3DM-GX5-25 | 3DM-GX5-15 | 3DM-CV5-10 |
|---------------------------------|-----------------------------|----------------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| Gyro Bias Instability | 5°/hour | 5°/hour | 8°/hour | 8°/hour | 8°/hour | 8°/hour |
| Gyroscope Range (*standard) | ±75, 150, 300*, 900°/sec | ±75, 150, 300*, 900°/sec | ±75, 150, 300*, 900°/sec | ±75, 150, 300*, 900°/sec | ±75, 150, 300*, 900°/sec | ±250, 500*, 1000°/sec |
| Vibration Rectification Error | 0.002°/s/g ² rms | 0.0005°/s/g ² rms | 0.001°/s/g ² rms | 0.001°/s/g ² rms | 0.001°/s/g ² rms | -- |
| Accelerometer Noise Density | 50 µg/√Hz | 50 µg/√Hz | 25 µg/√Hz | 25 µg/√Hz | 25 µg/√Hz | 100 µg/√Hz |
| Accelerometer Range (*standard) | ±5* g | ±5* g | ±2, 4, 8*, 20, 40 g | ±2, 4, 8*, 20, 40 g | ±2, 4, 8*, 20, 40 g | ±2, 4, 8* g |
| Interface | USB, RS232 | RS422 | USB, RS232 | USB, RS232 | USB, RS232 | TTL UART |
| Weight | 105 g | 205 g | 20 g | 16.5 g | 16.5 g | 8 g |
| Dimensions | 76.2 x 65.4 x 18.9 mm | 88.3 x 76.2 x 22.2 mm | 44.2 x 36.6 x 11 mm | 36.0 x 36.6 x 11.1 mm | 36.0 x 36.6 x 11.1 mm | 38 x 24 x 9.7 mm |
| Operating Temperature | -40 to 85 °C | -40 to 80 °C -55 to 80 °C (no mags) | -40 to 85 °C | -40 to 85 °C | -40 to 85 °C | -40 to 85 °C |

| APPLICATIONS | 3DM-GQ4-45 | 3DM-RQ1-45 | 3DM-GX5-45 | 3DM-GX5-25 | 3DM-GX5-15 | 3DM-CV5-10 |
|------------------------|------------|------------|------------|------------|------------|------------|
| Navigation | □□□□ | □□□□ | □□□ | □□ | □□ | □□□* |
| Platform Stabilization | □□□□ | □□□□ | □□□ | □□□□ | □□□□ | □□□* |
| Antenna Pointing | □□□□ | □□□□ | □□ | □□ | □□ | □□* |
| Regime Monitoring | □□□□ | □□□□ | □□□ | □□□ | □□□ | □□□* |
| Robotic Control | □□□□ | □□□□ | □□□ | □□□ | □□□ | □□□* |
| Motion Tracking | □□□□ | □□□□ | □□□ | □□□ | □□□ | □□□* |

□□□□=Superior □□□=Excellent □□=Very Good □=Good

* as an IMU core

LORD Sensing-MicroStrain® INERTIAL SENSORS

3DM-DH3™ Downhole orientation sensor and datalogger

The 3DM-DH3™ incorporates acceleration sensors, magnetic field sensors, and temperature sensors, together with an on-board microprocessor, embedded software algorithm, non-volatile memory for configuration, flash datalogging memory, and serial communication interface. Its form-factor, rated temperature range and power supply requirements are optimized for downhole applications. The 3DM-DH3™ provides accurate drill path measurements including GTF, MTF, Inclination, Azimuth, Dip Angle, sensor temperatures, G-TOT and H-TOT.

Specifications:

Accelerometer Noise Density: 110 $\mu\text{g}/\sqrt{\text{Hz}}$ | Interface: RS422 serial | Weight: 91 g | Dimensions: 177 x 22 (dia.) mm | Temp Range: -40 to 125 °C



MIP™ Monitor | SensorConnect™

MIP™ Monitor is the standard communications protocol for all current LORD Sensing-MicroStrain® inertial sensing systems. Its data protocol and packet structure were designed to incorporate data from many sources, at many data rates, into an efficient stream.

It is flexible and open-ended, and it dictates extremely strong data typing for unambiguous data communication. It can also accommodate thousands of new data types, and new devices or features can be accommodated with little or no code changes. MIP Monitor's typed packet allows for quick routing, and its small size is perfect for easy buffering.

SensorConnect is the next generation in desktop sensing software

Highlights:

- SensorConnect is the next generation in desktop sensing software
- Connect to a remote WSDA-1500 anywhere in the world via TCP/IP.
- Configure and start large, time-synchronized networks of Nodes.
- Visualize massive amounts of data in fully customizable dashboards.
- Export your data to CSV to use it elsewhere.
- Log in to SensorCloud to analyze your cloud data with your local data.

Both MIP Monitor and SensorConnect are available at:

<http://www.microstrain.com/software>

The screenshot displays the SensorConnect software interface. The top window, titled "3DM-GX5-45 6236.00016 Estimation Filter Data", shows a "Device Status" section with "Streaming Data" selected. Below this are control buttons like "Clear", "Init Filter", and "Reset Filter". A table displays various sensor parameters:

| Parameter | Value | X | Y | Z |
|--------------|---------|---------|---------|---------|
| Angular Rate | -0.0000 | -0.0000 | -0.0000 | -0.0000 |
| GYRO BIAS | ***** | ***** | ***** | ***** |
| GYRO SCALE | ***** | ***** | ***** | ***** |
| Acceleration | 0.4458 | -3.0732 | 9.1184 | |

The bottom window, titled "3DM-GX5-45 6236.00016 3D Orientation", shows a 3D visualization of the sensor on a compass rose. The sensor is labeled "LORD MicroStrain® 3DM-GX5-45 // GPS-Aided Inertial Navigation System S/N: 6251". The right sidebar contains "Streaming Data" controls, including checkboxes for "Show Accelerometer", "Show Angular Rate", and "Light". There are also buttons for "Align With Screen", "Realign Up", and "Realign North".